# SIGNA

## SPECIES IRIS GROUP OF NORTH AMERICA

#45 Fall, 1990
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# SIGNA

SPECIES IRIS GROUP OF NORTH AMERICA
Fall, 1990 Number 45

## OFFICERS & EXECUTIVES



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Fall, 1990--No. 45



SIGNA is published two times per year, fall and spring. We welcome contibutions from readers. Any Iris group has permission to reprint any material first presented here. Deadlines are February 1 for spring and September 1 for fall. Your address label imdicates your current dues status. Questions--contact Florence Stout.

BACK ISSUES are available from Alan McMurtrie at $2.00 each.

# CHAIRMAN'S MESSAGE

Elsewhere in this issue of SIGNA you will find a sample page of one of the iris watercolors of Jean Witt. For some time now, there has been talk of adding color to these pages, and since Jean very graciously offered the use of her watercolor drawings, it was decided to combine them into a portfolio. This project has now been completed and we are grateful to Jean for her generosity. The set is being offered at cost and details about it and how to order are in this issue. We hope you will take advantage of this amazing offer.

We are also pleased to announce that the translation from the Chinese into English of the Iris section of the Flora of China by Dr. Zhao is also completed and will be published by Timber Press, Oregon, sometime next spring. Also included in the book is an introduction to Chinese irises in the wild and in the garden by Dr. James Waddick. It will be illustrated with colored pictures of irises of China. The book follows closely on the heels of Dr. Waddick's successful trip to China where he collected and brought back some seventeen Chinese iris species. SIGNA was a major contributor to the English translation of Dr. Zhao's writings and we look forward to the release of this important work.

At the AIS Board of Directors meeting at Omaha last spring, the question of whether a species iris is eligible for Best Specimen of Show award was brought up. This is a vital issue that affects all of us who grow species, and as of this writing, no action has been taken by the AIS Board. Best Specimen of Show was won by species on five different occasions in 1989 and with the growing interest in species, this number could very well increase. There is also a movement afoot to create some kind of award for outstanding species irises. Please let us know your views on this vital subject by writing to Bob Pries, who is spearheading the awards movement, 6023 Antire Rd., High Ridge, MO 63049. [a copy to the editor would be appreciated. Ed.] It is imperative we let the AIS Board of Directors know our views so that a workable solution can be found for this problem. Please write today.

Once again the time to gather iris seed has come and gone, and Seed Exchange Director, Phoebe Copley, is busy receiving and packaging seed for distribution over the next few months. This is Phoebe's last year as Director, however, and we must find another to take over this important job beginning next year. Would you be willing to help? Not only is the Seed Exchange an important part of SIGNA but this service is valuable to plantspeople everywhere.

And, once again, all too quickly, another year has come and gone. We hope it has been a good one for you. We send our very best wishes for the new one.

Colin Rigby
Penngrove, CA

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# SIGNA
# PRESENTS THE
# IRIS WATERCOLORS OF
# JEAN WITT

The set consists of some twelve pages with a total of fifteen different iris subjects printed in full color on heavy, acid-resistant, non-yellowing paper. Page size is 8½ x 11 inches and each is suitable for framing. All were painted from life of irises raised and flowered in the Seattle area and give us an opportunity to see in color some rare and unusual species.

Irises included in the folio are:

*I. ruthenica*

*I. missouriensis*

*I. tenax*

*I. bakeriana*

*I. decora*

*I. unguicularis* 'Mary Barnard'

*I. reticulata* 'Purple Gem'

*I. rossii*

*I. chrysophylla*

*I. bucharica*

*I. kolpakowskiana*

*I. setosa canadensis*

*I. verna*

*I. innominata*

'Violet Beauty'

Individual sets are sent in their own envelope and are backed both sides with heavy clipboard to insure safe arrival.

Cost of the complete set is $8.50 postpaid. This is first class mail in the United States and Canada and surface mail on overseas orders. For overseas airmail, add $2.50 additional. Make check or money order payable to SIGNA and send to: SIGNA, 2087 Curtis Drive, Penngrove, CA 94951.

The Watercolors are being offered at cost, and although a sufficient number of sets were printed, when current supply is exhausted, the offer will not be repeated as the printing plates have been destroyed.

A sample print is included in each issue. Enjoy!

*I. reticulata*

*'Purple Gem'*

## Iris pariensis. The Paria River Iris: A New American Species

by James W. Waddick

Dr. Norlan Henderson, recently retired from his position as Professor of Botany at the University of Missouri, Kansas City, jumped head first into a new project as a participant in the new "Flora of North America." This is the first comprehensive flora for this area that is being compiled by the Missouri Botanical Garden. Dr. Henderson has the responsibility to review the genus Iris for this project. Without elaborating on Norlan's extensive field, herbarium and lab experience, he is well qualified for the job of reviewing all the state, regional and local floras he could locate. During the course of these reviews he 'discovered' an article on the Flora of Utah that referred to Iris pariensis, a name new to him.

In his thorough way, Norlan located the original description of this species and since then has borrowed the herbarium material. Following is an excerpt of the original description by Stanley L. Welsh from the Great Basin Naturalist 56(2) 254-260, 1986:

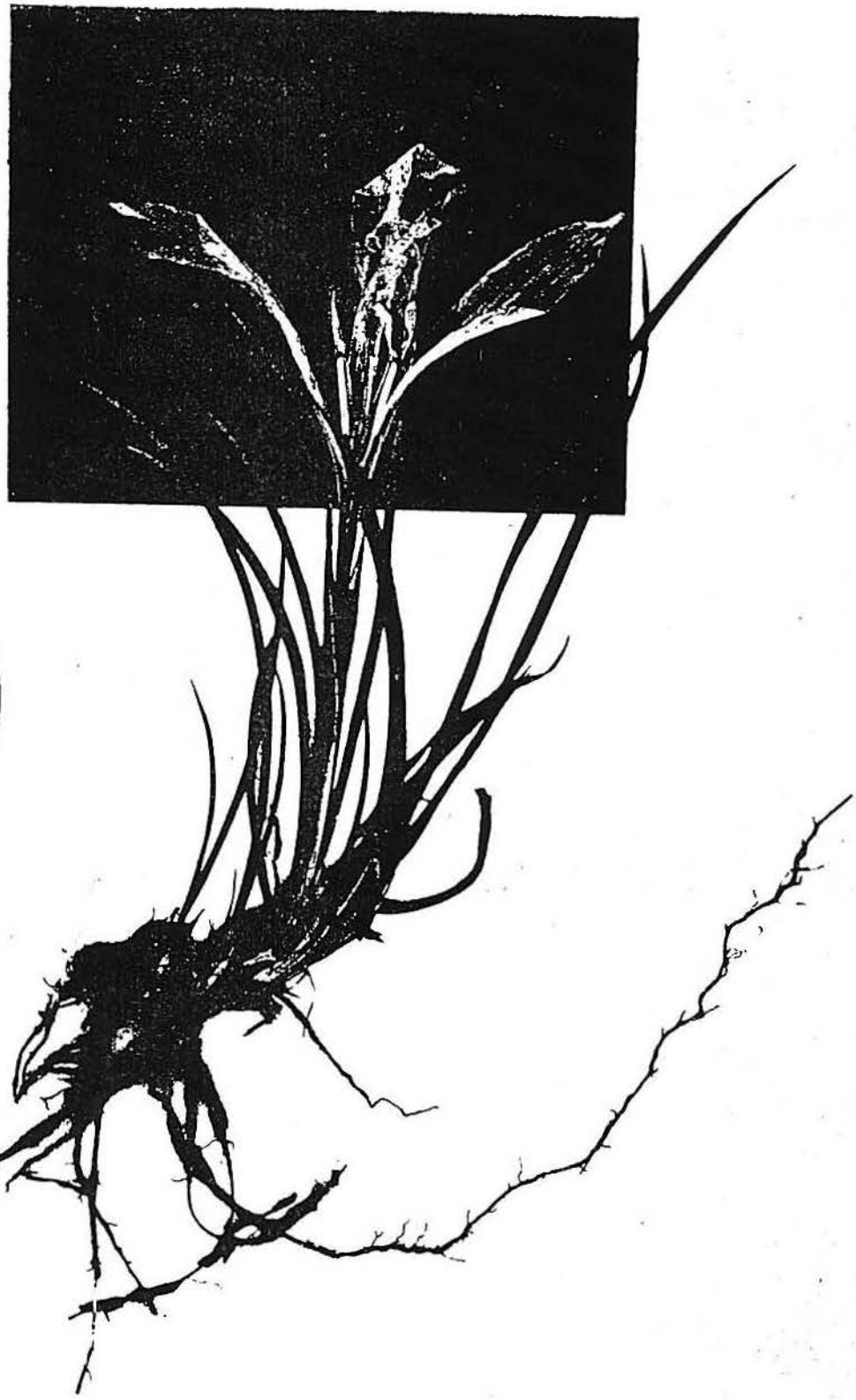
Iris pariensis Welsh 1986: "Rhizome less than 10 mm thick, clothed with shredded fibrous leaf bases; leaves several to many on both fertile stems and innovations, 2-5 mm wide, (4)7-24 cm long, stramineous to brownish or purplish basally; flower stem 4 cm tall, with several sheathing leaves free almost throughout; flower 1; spathaceous bracts linear-attenuate, 2-3 mm wide, 5-6 cm long, parallel, subopposite, herbaceous; ovary ca 12 mm long; perianth apparently white, the tube 15 mm long; sepals ca 6 cm long and 1 cm wide; petals narrowly oblanceolate, ca 6 cm long and 8 mm wide; style branches ca 2.8 cm long, the crests ca 7 mm long; anthers ca 13 mm long; capsule unknown."

The plant was collected only once in May of 1976 by Vane O. Campbell in Kane County, Utah, south of Hwy. 89 in sandy soil. It was found in a semidesert grass shrub community at 1,403 m. altitude. The type specimen is located in the Brigham Young University Herbarium under specimen number166947. The specimen was originally labelled I. missouriensis.

In the description, Dr. Welsh suggests that the actual relationship lies with species "far to the west in the coastal states." The following year, in an article called "A Utah Flora" (Great Basin Naturalist 47(9) 1987), Dr. Welsh repeats the description with one significant typographical error in his review of all Iris species in the state ( The native I. missouriensis and the introduced I. germanica and I. pseudacorus ).

These two literature citations for this species remained basically unknown to most students of Iris until Dr. Henderson's detailed review of the literature. Norlan has brought this species back into the light and introduced a surprise and a mystery.

1624





Holotype of Iris parlensis Welch
Great Basin Naturalist 46: 256. 1986
Kane Co., Utah. East Clark Bench, south of US Hwy 89, T43S R1E.
Sandy soil, found in a semi-desert grass shrub community. 4600ft.
Vane O. Campbell 42 May 1976
Herbarium of Brigham Young Univ., Provo, Utah

Having seen the original specimen myself, I can confirm Norlan's view that this is a distinct species. The combination of extremely narrow leaves, the short peduncle and perianth tube and unlikely environment make this a surprise to all who see this specimen. The plant was collected only a single time and the original and only herbarium specimen consists of three separate plants, only one with a single flower. The dry flower color is very light cream to near white. It may have faded, but I doubt that it was any darker than light yellow at best. I suspect it was originally lighter and has darkened with age. It was collected in 1976, but held almost ten years before it was described as a new species. It has not been observed or collected since although some attempts have been made.

There are few American irises adapted to growing in the environment where I. pariensis was found. Because I. missouriensis is the only other iris found in Utah it was first assumed to be that species. However it is not at all similar to that species. Norlan has made detailed further comparisons with all known species of Pacific Coast Native species (Series Californicae) and found no strong relationships.

How has this species remained unknown until now? The plant was located in an area south of Hwy 89 along a new road that parallels part of the Paria River. Presumably it is an uncommon plant and in an area that was until recently inaccessible. It may also bloom for a very brief period and may have been overlooked because of its grassy appearance when out of bloom. It is in an area where any logical person would not normally look for native irises. Whether it is common or rare remains to be determined since it is probably inconspicuous even in peak bloom.

The collection date is simply "May". Whether this was early or late in the month or even atypical is a mystery. Obviously further field study is needed. In May of1990 Dr. Henderson and his wife Jean, another able irisarian, travelled to southern Utah for the great Iris pariensis hunt. They went directly to the originally described location and conducted a fruitless search. The terrain is sandy, dry and an unlikely one for irises of any sort. Meanwhile, Roy Davidson of the Seattle, Washington area was travelling the same area in regard to another project and diverted his attention to the Paria River to look for this plant. He talked with representatives of the Bureau of Land Management and located some seepage areas near the original location, but was unable to find any sign of the plant either. He too says the "terrain - even in the vicinity of the Paria River - is far from hospitable for such a plant'.

So the mystery remains. This iris if is exists or still exists or ever existed in the Paria River drainage awaits rediscovery. If students and irisarians in the vicinity of S. Utah and N. Arizona are familar with this plant, I'd be eager to hear from them. Otherwise we are left to wonder about the fate of the new, rare and still elusive American native, the Paria River Iris.

**Pseudoregelia News** by James W. Waddick

In the first issue of the Kew Magazine for 1990 there are two articles of interest to iris growers. Both articles regard pseudoregelia species. In related iris research I have been intrigued by one of these problems. Brian Mathew in the article "A Note on the Nomenclature of Iris Kemaonensis" discusses the correct name and spelling of this iris. This iris was originally described in an address to the Linnean Society in 1838 by D. Don, the transcript of this talk was not published until 1840. It was then published as I. kamaonensis. Meanwhile Royle published the description of this same iris in his book on Himalayan Flora in 1839 and spelled the name I. kemaonensis. Since scientific names are generally based on priority of publication it is clear and Mathew states that the correct designation must be I. kemaonensis D. Don ex Royle.

Incidentally, Mathew in his book 'The Iris," Kohlein in "Iris" and in "The World of Irises" all use the spelling with an 'a'. Last year in researching and working on a translation of Zhao Yu-tang's Iris section from the Flora of the People's Republic of China I noted his use of the spelling kemaonensis. Zhao gives a detailed and timely literature review that shows the priority.

I also had the opportunity to check the derivation of the name. The location in question is a range of mountains in Burma. In the above article Mathew mentions the location as "Kumaon". Royle is his description referred to the same location as 'Kemaon'. Hooker in 1892 spelled the iris I. kumaonensis in reference to the location spelled 'Kumaon". A review of recent atlases has convinced me that the location is now spelled simply 'Kumon' in American editions. This may be a difference between American and British spellings of this place name.

In summary this iris should be referred to as the Kumon Iris, I. kemaonensis.

The second article in the Kew magazine describes a new species of pseudoregelia closely related to I. kemaonensis. This new species, I. dolichosiphon Noltie, was described from seed collected in northwest Bhutan and grown at the Royal Botanical Garden in Edinburgh, Scotland. The colored illustration shows a beautiful deep purple iris of striking form. The standards are reflexed to meet the falls and the ruffled style arms are held up slightly. Apparently it has been collected frequently as long ago as 1933, but confused with I. kemaonensis for a variety of reasons. It can be distinguished from I. kemaonensis as follows:

| I. dolichosiphon | I. kemaonensis |
|---|---|
| Flower uniform deep violet unblotched | Flowers of various colors, always blotched, even in dark forms. |

*Iris dolichosiphon* MARY BENSTEAD

| | |
|---|---|
| Standards deflexed | Standards erect |
| Perianth tube to 14 cm. | Perianth tube to 8 cm |
| Seed capsule narrowly elliptic tapering to an acute apex | Seed capsule sub-globose |

Range: Bhutan and China (Tibet, possibly Sichuan and Yunnan)
Habitat: Found from 2740- 4,130 m on steep south facing hillsides. Vegetation consisted of scrub, shrubs, open grassy hillsides and scree.
Chromosome number : 2N = 22
Cultivation: Grown in Edinburgh in full sun in well drained ordinary garden soil. Profuse flowers in June. More free flowering than I. kemaonensis or I. hookeriana. Propagated by division. No seed produced in cultivation. Considered to have no special requirements and hardy.

## LOOKING FOR *IRIS PARIENSIS* IN UTAH

By B. LeRoy Davidson

This iris was only recently described and from a single collection seen locally but one time and apparently never refound. The site was in the Paria River drainage in southern Utah, east of the Vermillion Cliffs formation and south of Highway 89. On the bright morning of this last May 25th, you could have been with us at the regional office of the Bureau of Land Management at Kanab where we hoped to find guidance to a likely spot for an iris in this barren desert region adjacent to Colorado River's Grand Canyon. We predicated a springy area or an intermittent stream course, of which there were none, but we were told of two possible seepages, miles apart and on different side roads from the highway. We drove out the first and more unlikely of the two and gave it up after about an hour of tedious, hot and dirty miles over a mesa sparsely vegetated but with a nice calochortus in thin grass and scrub.

Cautious this second time, we surveyed the terrain from the pavement, looking for evidence of some extensive seepage, like willow patches, which are usually pretty obvious. We were over-looking an enormous landscape of broken cliffs in an eastern exposure and there was no sign of willows or any other such growth. Another time we will be prepared with more precise directions and then willing to spend more time.

*Iris parienses* Welsh 1987 is described as more nearly resembling a small member of the Californicae rather than *missouriensis*, the species to be expected. Although this last can subsist under very stressful conditions, it always remains easily recognizable.

# SPECIES POPULARITY POLL

This is an opportunity to vote for your favorite species clone or species cross. In doing so, you will be recommending these iris to other species enthusiasts. Since this is the first such poll, the list of cultivars is arbitrary and I encourage write-in votes. Please vote for five in each category. Send the ballot to me for tabulation. Bob Pries, 6023 Antire Road, High Ridge, MO 63049.

Species selections:

____*I. pumila* CARPATHIA
____*I. versicolor* VERSION
____*I. versicolor* WHODUNIT
____*I. versicolor* GEM DANDY
____*I. astrachanica* KALMIKIJ
____*I. brevicaulis* TERRITORIAL RIGHTS
____*I. pallida* ZEBRA
____*I. pseudacorus* BEURON
____*I. prismatica* POLLY SPOUT
____*I. cristata* VEIN MOUNTAIN
____*I. lutescens* NANCY LINDSEY
____*I. setosa* KOSHO-EN
____*I. confusa* ELWOOD MOLSEED
____*I. unguicularis* 'Bunty'
____*I. aphylla* 'Polonica'
____*I. laevigata* (albopurpurea) COLCHESTERENSIS

Write-ins:

_____

_____

_____

_____

_____

_____

Species crosses

____ROY DAVIDSON
____STARTING SIBTOSA
____HONIANA
____FAR VOYAGER
____FINE LINE
____IN STICHES
____HALF MAGIC
____HOLDEN CLOUGH
____PALTEC
____GERALD DARBY
____HOOGPUM 'purple'
____PUMAR ALPHA

Write-ins:

_____

_____

_____

_____

_____

_____

Most all binomial species names have been registered with the American Iris Society in the 1928 checklist. If you vote for a species with no varietal names but is a distinct form it would be beneficial to register a name for the variety with the A.I.S. Without a unique name a plant can be easily ignored and lost.

Your comments on this survey will be appreciated.

# OUR READERS WRITE

I would like to raise a question about seed set in *Iris japonica, I. confusa* and their hybrids. Is it possible that these species are self-sterile--more or less like 'Bing' and 'Royal Anne' Cherries--so that the plants will not set seed to their own pollen, but will set seed when crossed with other clones or related species? This past spring my *I. japonica* and the Chengdu form of *I. confusa* were in bloom together and I crossed the two. Two pods resulted and one has matured seed. I have previously selfed 'Chengdu' without result and have never had a seedpod on *I. japonica* in all the years I've grown it. This is something that will be well worth our checking out further, as we now have more clones of crested species than have ever been available before, thanks to Jim Waddick's introductions from China.

Seattle had so much rain in June that the Waddick plant of *I. confusa* thought the monsoon had set in and put up a bloom stalk in July. Its small lavender blossoms are perhaps a trace larger than those of 'Chengdu', and the markings are orange instead of yellow. The number of buds and position of branches also seem to differ slightly.

Jean Witt
Seattle, WA

To those members of SIGNA also interested in growing bearded iris, especially tall bearded (you know those colored hankies on sticks), there is a major surge of interest in reblooming cultivars. Not so for species growers although there are more and more Siberian and Japanese cultivars being introduced with rebloom tendencies. Can Louisianas and Spurias be far behind? And what of species?

I know there are a few bearded species that rebloom (*I. subbiflora* is, I think, the major donor of this trait to the bearded lines), but what of beardless reblooming species? I was surprised late this summer to have rebloom on a single fan of an *I. laevigata* rebloom. This particular plant was mentioned in my earlier SIGNA article on 'Iris With Variegated Foliage' (SIGNA #40: 1431) because it is not the typical variegated form, but an odd one I obtained originally from Akira Horinaka of Japan. One flower stem with two typical blue flowers appeared and both set pods without my help. Obviously selfed since no other iris were in bloom at the time.

I was surprised at the time to see *I. laevigata* rebloom. Since it is always growing in water, this was not an exceptionally 'wet' year for it although we did have good spring rains. Also, because of my busy schedule I did not fertilize it this year at all. I'd be interested to hear of other members' experiences with reblooming species, especially beardless species. Is this more common than I thought? Please drop me a line and if there are enough comments, I'll compile a list for a future SIGNA report.

James Waddick
Missouri

# WHERE CAN WE FIND IT DEPARTMENT

(Answers can be sent to the editor, address inside front cover. State whether you want answer published or just forwarded to inquirer.)

Ruth Holleyman

I am hoping that some SIGNA members might be of help in finding one of the historical Louisiana iris that has apparently been lost.

The iris in question is a triploid *I. giganticaerulea* that was collected by Mr. G. W. Holleyman back in the early 1950s and was distributed under the name of RUTH HOLLEYMAN. Apparently the triploid iris became mixed with a diploid clone and is for all practical purposes lost.

Mr. Joseph K. Mertzweiller sent me a start of the plant he grew as RUTH HOLLEYMAN but various things about it led me to think the plant was a diploid rather than a triploid. Both clones were essentially pod sterile but while RUTH HOLLEYMAN was also pollen sterile, the false RUTH HOLLEYMAN has extra fertile pollen. After a number of false starts, I finally made enough chromosome counts showing the plant had 43 chromosomes to be certain that the plant was a diploid. RUTH HOLLEYMAN is a tall plant (50-60") with a large pale blue bloom having an orange signal. Although the triploid plant makes apparently vigorous growth, it may not be easy to get started. The diploid plant also makes vigorous growth but is an easy plant to grow.

Only one other triploid Louisiana iris has been reported and was first registered under the name of HEXAGON BLUE in 1959 but was later renamed TRIPLE TREAT when it was discovered to be a triploid.

My findings about the iris I grow as RUTH HOLLEYMAN are in the April 1990 issue of the AIS bulletin and a follow-up article by Mr. Mertzweiller should appear in the AIS bulletin in the near future.

If any members think they might have either of the triploid plants, please contact the writer. I would like to obtain a start of these plants for which I will gladly pay. As there has been so much confusion concerning the triploid RUTH HOLLEYMAN, don't try to be 100% certain of your plant before getting in touch with me.

Samuel N. Norris
3128 Settles Road
Owensboro, KY 42303

## OUR READERS WRITE

The time has come, somebody said, to speak of many things; there is certainly no doubt that, having received some prestigious award, a plant will enjoy a certain boost of interest and a popularity that may endure. I certainly have no quarrel with Bob Pries (p. 1591) although I did question the attitude that since there is no current award for [what we call] the species, there is little incentive to growing and showing them. I am fully confident that anything that is truly an innovative improvement will receive deserved attention as merited, but only if it is not hidden under a bushel, awards notwithstanding.

I do very much hope that something comes from this interest in establishing an award as outlined, and I also pray that terms of eligibility and other details of technical nature can be outlined so that the whole thing is easily workable.

May I respectfully remind the SIGNA audience that the initial crosses of *I. pumila* with TBs which were to prove so truly innovative as to give rise to the SDB Pogon class were not those results of the Cook-Douglas team effort introduced commencing in 1953 as Lilliput Hybrids; Bob Schreiner must be credited with having made those, even though none of his earliest results were ever registered nor did they make it to the catalogs. They did, however, inspire Paul Cook, who gave us that first popular fertile trio, the unforgettable GREEN SPOT, FAIRY FLAX and BARIA (R. 1951). This sort of cross was recorded in France about the same time, as made by the geneticist, Marc Simonet, though there is no authentication other than a reported chromosome count at a time when many little wild pogons were going as "pumila." We long ago recognized that the reported "pumila" of the Sasses and others of the period were 40c. pogons of a mixed bag (now probably covered by the name *I. lutescens* Lamarck). Insofar as the record goes, none of the Simonet results from this cross were "real" beyond the printed page. Walter Welch drove these points home in his inimitable Welch way.

Remembering Walter and his possessiveness of the word "dwarf," to Mr. Dwarf Iris (as he was pleased to call himself) that word belonged exclusively as a noun to an iris about 4 to 10 inches tall flowering very early and with a beard; never, never was it to be used as an adjective qualifying any other sort of iris. When we were considering the organization of a Species Iris Study Group, Walter, "Mr. Dwarf Iris," advised us rather sharply to mind our own business, that he'd already taken care of that! Clearly, to him, bearded little ones such as *pumila* and *chamaeiris* were the only "species" worthy of any attention.

B. LeRoy Davidson
Bellevue, WA

# OUR READERS WRITE

My letter is in response to the article that Bob Pries published in the spring issue of SIGNA (#44), entitled "*Awards for Species and Hybrids*?" It seems important to me to support him, as the interest in species and hybrids is growing rapidly.

We have an important breeding program, here at W. H. Perron & Co. Ltd., and we work mainly with *I. versicolor* but also with *Ii. setosa, pseudacorus*, and *ensata*. As you can see, we are directly concerned with the cause Mr. Pries is promoting--working essentially with species. We have, at the present time, developed beautiful varieties and have obtained astounding hybrids.

The efforts and time required to obtain such results are at least the same as those needed with the beardeds and Siberians. There is absolutely no reason why such work shouldn't be rewarded by special awards, just like the bearded irises are.

I assume that in the past there was not a great interest in species and their hybrids. But TIMES HAVE CHANGED: Versicolors are becoming an important part of the Iris garden and should be recognized as such. It would also encourage their registration and propagation, which is important in marketing new varieties.

We plan to release our firsts on the market in one year or two. We need, as other breeders do, support from SIGNA, and the best way is, of course, to establish an award system.

By the way, I participated in the show of the Iris Society of Massachusetts last June 3, and the Queen of the Show was a versicolor! But I found that our entries had to compete with beardeds and Siberians in the "Seedling" class. It's not very encouraging. However, I liked the experience very much (it was my first) and I will surely renew it.

I fully agree with Mr. Pries, and hope his efforts will succeed.

Monique Dumas-Quesnel
Research Assistant Director, W. H. Perron
Quebec, Canada

# THE BEAUTIFUL NEW BOOK OF KAKITSUBATA

by B. LeRoy Davidson

Mr. Horinaka's lovely book which was reviewed as a "little" book from the manuscript copy (SIGNA p. 1590) has been received and it is impressive in every way, far from being little. The simple, straightforward text tells all we need to know, but OH! the pictures! We are at last enabled to grasp subtle differences in shape, form and coloration of the nearly 75 named cultivars depicted, some of which sound so similar put to us in words. There is a total of about 120 pictures, 86 pages of them, and not stingy little pictures either. Due to the page size and the fact that many are full page with several spread over a double page, it is almost like being right there!

Such pictures set us wishing we had more than the mere handful of cultivars, and serve as a guide to the correct names for some of those. What we grow as ALBA is probably YAGARUMA or possibly the older and similar SHIRASAG, though it is not pictured. The fine silvery-white-variegated one with blue-violet flower is doubtlessly the unnamed plant of p. 64. What appeared on the cover of AIS bulletin 223 as Wallace's COLCHESTERENSIS is discussed as at least very similar to MAIKUSAKI, and what we know as SEMPERFLORENS seems to have been raised from seed by Perry, so it is not a duplicated named one (of several) of the remontant indigo-violet clones known for generations in Japan.

Of course we yearn for such azures as AITORI or for GOSHOBENI which seems far redder than Perry's REGAL or for such classic whites as KOZONOYUKI, although the author as a purist tells us no complete albino is as yet known. We covet the 6-petal, red-freckled AMANAKAWA and such delectable pastels as the azure GOSHOMURASAKI with a heart of violet styles or the white HAKUCHONOUTA with a rosy heart. We are intrigued too, with the out-cross hybrids, the VERSILAEV sorts of which a number are pictured with names, and others of the wide-cross examples, even those of *laevigata* with *ensata (kaempferi)* a cross which has at last and without much doubt been made between these two oriental water-iris.

There are photographs, too, of some of the art objects inspired by the long reverence of the Japanese people for this iris, from an ornamented inkstand to an enormous gold-leaf room screen painted boldly with indigo irises and a mass of green leafage. We know this from postcards and other facsimile reproductions such as shopping bags and hanging scrolls.

This is very clearly an iris connoisseur's book, one both beautiful and useful. It is available from the author, shipped in its own slip-case for $60 plus shipping, $8 surface or $15 air. Send postal money order to:
Akira Horinaka, Oide-Cho, 9-31, Nishinomiya, 662 Japan.

## *IRIS MISOURIENSIS* 'Camas Blue'

By B. LeRoy Davidson

On SIGNA p. 1331, I wrote of a particularly vigorous clone of *Iris missouriensis* growing in a high meadow in the White Mountains of east-central Arizona. Some seed capsules were gathered for me later that year, but they contained only aborted chaffy material; not one good seed in the lot. This fact in a species known to set plentiful seed, plus the unusual size of the clump--well over a hundred feet across--led me to speculate that here was something unusual, perhaps a triploid. And it might prove to be a better than average garden plant for obvious reasons.

In May of this year I was in the area again and made a particular point of refinding the plant. Due to the general drought for several consecutive seasons, it had nearly disappeared; only an occasional scrabble of an iris fan where before the meadow had been more than knee high and the flowers so many that from half a mile off it looked like a blue vale of Camassia. Nevertheless, a number of the fans were lifted and set into a styrofoam cooler in a few inches of the meadow's black humus soil where they rode for three weeks, covered and iced, aired at night. Three flower stalks were produced, three very nice flowers on each, and *Iris misouriensis* 'Camas Blue' is now in cultivation. In due time it will be shared around as it has grown vigorously. Write me if interested.

Fortunately the form of the blossom is most attractive and the color is good blue, veined onto white. Not quite so intense as the squill blue of those of Kititas Co., Washington, but good; I hope to enlist the help of a geneticist to make a chromosome study.

## ON EATING IRISES

It has always been an ingrained opinion from 60 or more years' observations, that irises were just simply not palatable. I suppose it began with noting as a youngster how horses, cattle and sheep alike shied away from our Prairie Blue Flag (*Iris missouriensis*) browsing pasture grasses so close that their nostrils were right in the edges of iris clumps yet that none of them ever so much as nibbled at an iris leaf. I noted, too, that when you picked these flowers to take to a teacher or bring home to Mom, that a very rank odor filled the air, so potent it could water your eyes or--like when the sickle of the mower cut through a clump in the hay meadow--give you a headache and brief blind staggers. It was therefore, with considerable wonder that I closely read something about edible irises in the 1983 BIS Yearbook under the provocative title "The (Good) Iris Food Guide." Only when I got to the very end did I notice that it followed immediately on a very succinct article dealing with garden mollusks and that its contributor had signed itself, "A. Black-Slugge." B.L.D.

# HOLLAND TAKES AN IMPORTANT PART IN PRESERVING IRIS

An interesting reading by Mr. M. H. Hoog [somewhat condensed.Ed.]

## The Section Reticulata, Dykes*

| Species With Name of Author | Habitat |
|---|---|
| *bakerana* Foster | N.W. Iran (Azerbeidjan), S.E. Turkey (district Van), N. Iraq |
| *danfordiae* (Baker) Boissier. | Turkey (Cilision Taurus) |
| *histro* Reichb. fil. | S. Turkey, Syria, Lebanon, Israel |
| *histrioides* (G.F. Wilson) S. Arrnott. | Turkey, Pontic Alpes (mountain areas of Amasya and Merzifoen) |
| *hyrcana* Woron. ex Grossheim. | N. Iran (S.W. Kaspic region) |
| *kolpakowskiana* Regel. Kirgiz SSR, S. Kazakhstan | Central Asia, W. Tien-Shaan, |
| *pamphylica* Hedge. | Turkey (Western part of the Silicion Taurus) |
| *reticulata* M.Bieb. | N. Iran, N. Iraq, USSR, Transcaucasia, E. Turkey |
| *vartanii* Foster. | Syria, S. Lebanon, and Israel |
| *winkleri* Regel. | Central Asia, Western Tien - Shaan, Kirgiz SSR, Ferghana mountain(s) |
| *winogradowii* Fomin. | USSR, Transcaucasia, Georgia (the area of Tiflis) |

The well known secretary of the Royal Horticultural Society, William R. Dykes, considered *I. reticulata* as type species for this entire section in his large monograph "The Genus Iris." This section is characterized by some, more or less, equally shaped bulb-growing species which bloom in winter and spring. Stems are usually quadrangular but octagonal on *I. bakeriana* or pentagonal on *I. kolpakowskiana*. Mathew and Wendelbo have also found intermediate forms between *I. bakerana* and *I. reticulata* with five, six, or seven angles, in N.W. Iran. Some of the 11 species

above also have a number of varieties and/or subspecies, such as *I. histrio, I. histrioides* and *I. reticulata.*

The habitat of this section restricts itself to Asia. The eastern boundary is in central Asia, western Tien - Shaan (China) and the Pamair - Alai mountains. The southern boundary is from Kashmir westward through Pakistan, Afghanistan, and Iran through Syria to South Israel. The western boundary is in Turkey and the Sinai; so there are no Reticulata irises in Africa or Europe. The northern boundary is at about 45° N. The bulb-irises, which this section belongs to, are real geophytes, that is, typical earth-grown plants that have developed to resist long periods of drought, heat or cold. This is expressed in the tough bulbs that store extra food, and the leaves, often covered with a coat of wax. In the wild, the young bulbs are in a mass of old bulb-segments, which protects them very well against changes in temperature, and mice can hardly ever find and eat them.

Important role of Holland

Holland has an important part in preserving species outside the areas where they were found originally. In 1978/79 about 12.7 acres of these irises were grown according to the R.G.B.A. There were 4.9 acres of *I. danfordiae*, 4.5 acres of *I. reticulata* and about 3.3 acres of different reticulata cultivars and hybrids, *I. bakerana* and *I. histrioides* included. The irises grown here and exported exceed the quantities in the wild many times. In the beginning bulbs were collected and shipped to England, Germany and Holland but now we are almost self-supporting. Thus the necessity of collecting wild material has been strongly reduced. At this time much attention is given to preserving the wild species, especially when they die out in their habitats.

Dutch growers can increase the rare wild material much faster than they used to and offer them to the public. For example *I. danfordiae*--we could now send back material to Turkey if nature preserves in that country or other countries would ask for it.

Fortunately, in western Holland we have a good combination of climate and soil with fine dune-sand or sabulous (sandy) clay soils. Temperatures in summer and autumn can give us a good harvest. Usually, reticulatas like adequate water and limey soil excepting *I. winogradowii.*

*I. vartanii*

*I. vartanii* and the white cultivar "Alba" are the first to bloom, usually at the end of December/beginning of January. The early bloom makes them suffer in bad weather we can have in Holland. It is better to give them a longer time in the barn and not plant them until November or December, so that development is delayed. In Israel *I. vartanii* is a protected plant. The species increases very slowly and it takes patience to build up a good lot.

*I. histrio*

The bloom of *I. vartanii* is followed by *I. histrio* which blooms at the end of January/beginning of February. The Latin name means actor or clown. Reichenbach de Jongere, who described this species, indicated that it concerned stained or spotted flowers. The most beautiful form was collected by Father P. Mouterde in South Lebanon at Saida. Less beautiful forms can be found in South Turkey in the Amanus mountains. They have much smaller pale-blue flowers, without the beautiful spots.

The American mission in Aintab, now called Gaziantop, in south Turkey, collected a beautiful light-blue form of *I. histrio* and sent bulbs and seeds to Mr. G. P. Baker, who lived in southern England. Mr. Baker sent a small amount to my grandfather, Mr. J. C. M. Hoog in 1933, who built up a nice lot, thanks to the knowledge of his garden-chief, Mr. Varmerdam. Later he introduced them as *I. histrio var. aintabensis.*

*I. bakerana*

In Holland, the natural flowering-time of *I. bakerana* is in January and February. The species was discovered by an Austrian, Paul Sintensis in north Iraq in 1889. From there, he sent the collected material to Max Leichtlin in Baden-Baden. About a century ago the name of Max Leichtlin was well known. His nursery was a kind of bulb-mecca. At his company in Baden-Baden he received bulbs and seeds of many unknown plants from Turkey and Asia, which were acclimatized and grown. Twice a year he sent out a catalog with a restricted and selected number of bulbs and plants. My grandfather bought one dozen of *I. bakerana* from him and that was the start of his first lot of this species.

Years later, in 1935, Mr. J. J. Manissadjan, an Armenian Christian, discovered *I. bakerana* also in east Turkey, in the region around Mardin and sent a lot of those bulbs to my grandfather. In that import were some which were a great improvement on the Max Leichtlin stock. My grandfather selected them and brought them to the open market. As far as I know, that is the *I. bakerana* that is now grown here in Holland.

*I. histrioides*

Manissadjan also discovered in north Turkey, a large-flowering variety of *I. histrioides*, which he sent to my grandfather and, it was then described as the variety *major*. The flowers are much larger than *I. histrioides* and the leaves are much more rough. Moreover, this variety grows much better than the usual species. The ordinary *I. histrioides* shows up wild in many other parts of Turkey and has smaller lilac flowers. To my opinion *I. histrioides var. major* is, because of the large dark-blue flower, a major improvement of the species.

Two other cultivars, apart from the one just mentioned, had been selected out of *I. histrioides*, namely cv. "G. P. Baker," (introduced at about 1909) with morish-blue flowers, named after Mr. G. P. Baker and cv. "Lady Beatrix Stanley," (introduced at about 1930) morish-blue, and named after the author of "Flora and Sylva."

The firm of Walter Blom and Sons introduced the cv "Reine Immaculée" in 1953 and the cv. "Angel's Tears" in 1974. *I. histrioides* "Angel's Tears" has remarkable large bright-blue flowers, which are considered as an improvement to *I. histrioides var. major.* In the wild, you can find the *I. histrioides var. sophenensis* in east Turkey, an alpine form, with smaller flowers than the species. All *I. histrioides* make a lot of small bulbs, so called corals (brood bulblets), on the base of the bulbs, when cultivation is good.

*I. danfordiae*

They have this characteristic in common with *I. danfordiae* , which we now come to. It was the Swiss botanist Edmond Boissier, who described the species *I. danfordiae* for the first time in 1884, from information by J.G. Baker. Some years later, in 1889, the German botanist Haussknecht described the same plant as *I. bornmuelleri* not knowing that Bossier had described it five years before. According to the International Rules of Nomenclature, one species can have only one name; Boissier's name *I. danfordiae* had, because of that, priority to Haussknecht's *I. bornmuelleri* and therefore the name last mentioned had to be lapsed. You can only find the name in old catalogs.

*I. danfordiae* flowers here in March/April. The tri-angled bright-yellow flowers are finely spotted green. In the wild, this species is extremely rare in the Cilicion Taurus. According to English botanists who have searched for it, it could be seen as a dying-out species if cultivation in Holland did not assure survival.

*I. pamphylica*

*I. pamphylica*, described by Ian Hedge from Edinburgh, also flowers in March/April. It was discovered only 25 years ago in south Turkey. Hedge named it after the former kingdom Pamphylia. The flowers have a beautiful combination of colors, namely purple-violet and olive-cream with large yellow blotches on the falls. *I. pamphylica* is very rare in the wild. It is not surprising that it took so long to find the species for the first time.

*I. hyrcana*

*I. hyrcana* can be found in nature southwest of the Caspis Sea and was originally described from the Talysh mountain. It is a small, low iris, about 10 cm. in height with bright-blue flowers and orange blotches. They bloom at about the same time as *I. reticulata. I. hyrcana* is distinct from *I. reticulata* by smaller more round flowers and by the fact that the bulbs with good cultivation can produce many corals like

*I. danfordiae, I. histrioides* and *I. winogradowii*. In "Flora Iranica," Mathew and Wendelbo considered *I. hyrcana* as a subspecies of *I. reticulata* a geographic form with a much smaller habitat.

*I. reticulata*

*I. reticulata* has a large variety of shapes and colors in nature. The *I. reticulata* originally described by Marschall von Bieberstein in 1813 has large dark campanula-violet flowers with yellow blotches. The cv. "Krelagei" has smaller purple-red flowers. The cv. "Cyanea" is small and light blue. In the natural wild populations you see the purple-red variety most, while the typical *I. reticulata* and the cv. "Cyanea" are definitely in the minority. there is a wide range of other colors between purple-red and light-blue.

Some cultivars of *I. reticulata* have a fresh fragrance, that makes you think of violets. This fragrance is strongest in the cv. "Jeannine." This cv. has smaller methyl-blue flowers with orange blotches and small white spots on the falls. This variety was named after my wife in 1958.

Crossings

*I. reticulata* has been used many times in crossings. My uncle, Mr. C. J. H. Hoog crossed *I. reticulata* with *I. bakeriana* and got the cvs. "Clairette," "Pauline" and "Spring Time." He also crossed *I. reticulata* with *I. histrioides var. major* and got "Blue Veil," "Harmony" and "Joyce," all three with a beautiful bright-blue color, and "Violet Beauty," dark violet-purple with a small yellow blotch.

Other cvs. have been introduced in England, such as "Cantab" in 1914 by Mr. E. A. Bowles with a bright blue color. Mr. E. B. Anderson from Lower Slaughter introduced the cv. "Cantab Alba."

The cvs. "Royal Blue," dark-purple, and "Wentworth," dark violet-purple, were introduced by Miss A. L. Hutley in the early thirties. The cv. "J. S. Dijt," reddish-purple with purple, was introduced by a grower from Texel (Holland) who gave his name to the bulb.

Mr. T.B. van Beden from Noordwijkerhout crossed cvs. out of *I. reticulata* with *I. histrioides var. major* and with *I. bakeriana* and introduced "Gordon" in 1971 and the cvs. "Ernest," "George," "Ida" and "Michael" in 1973. The last one strongly resembles a dark purple *I. histrioides var. major.*

*I. winogradowii*

*I. winogradowii* is quite rare in nature and is now considered as a threatened species in the USSR. The habitat is limited to the mountain Lomis-Mta in Georgia in the Central Trans-Caucasus. The species has large primrose-yellow flowers with small

purple-brown spots and a small orange line on the falls. The flowering-time here is in March and April. It is in many ways the Caucasian equivalent of the dark blue Turkish *I. histrioides var. major*. This is also expressed in the chromosome number, that is in both cases 2n=16.

In many areas *I. winogradowii* grows in a special environment (the soil and the neighboring vegetation), and has to be cultivated differently than the ordinary *I. reticulata*. It can best be grown in black peat ground with a lot of turf in half-shade. It can also be grown very well on a so-called peat bed in half shade and it will bloom there very well. It is a calciphobe (it doesn't like lime).

*I. winogradowii* doesn't like to be transplanted in summer or autumn. The new roots are made early in June and July while other species start later. The transfer could best take place in May or June. The little corals and little side-bulbs can best be planted immediately after digging because they are not resistant to drying out.

"Katherine Hodgkin"

The Englishman E. B. Anderson made a cross he named after Katherine Hodgkin, wife of Eliot Hodgkin, the chairman of the Alpine Garden Society. The large flowers resemble *I. histrioides var. major* but have a curious cream-yellow color. E. B. Anderson always thought it was a crossing of *I. histrioides var. major* x *I. danfordiae* but this is very improbable because the chromosome patterns of those species are so different (*I. histrioides var. major* 2n=16, *I. danfordiae* 2n=27, 28). The crossings were repeated in England. *I. histrioides var. major* x *I. danfordiae* failed while *I. histrioides var. major* x *I. winogradowii*, both 2n=16 chromosomes, produced good seeds. When those bloomed the seedlings were almost identical to the cv. "Katherine Hodgkin."

*I. kolpakowskiana*

*I. kolpakowskiana* is a rare species in this section. The habitat is central Asia, in the western part of the Tien-Shaan, the Kirgizian SSR and the south of Kazakhstan. The flowering time here is in March and April. The petals are lightly lilac-violet, the falls are pure white with a broad orange line, spotted beautiful purple with a large wide dark purple plate at the end. The leaves have a different shape with five angles and a deep furrow on the upper side, like the primitive Juno Iris, but the structure of the bulbs, the bulbskin and the shape of the flower fit in the Reticulata Section. this rare iris blooms best in rough granular dune-sand soil with perfect drainage in full sun. The form, once grown and offered by van Tubergen originated from Central Asia, where they were collected in north Kirgizie, south of Frunze, in the mountains at about 2,000 m.

*I. winkleri*

I have never seen the mysterious *I. winkleri*, that was described by Ed Regel as from Central Asia, the western part of Tien-Shaan. The habitat is in Kirgizië. The type was described from the Ferghana mountains, the Yassy mountain-pass. Attempts to find this species again have up to now failed. The possibilities of finding the habitat when the flowers are in bloom are limited according to Russian botanists. Only an expedition by air with, for example, a helicopter could have a chance. It is obvious that it is a wild species with only a limited habitat. The construction of the flower resembles *I. kolpakowskiana* in some ways, judging by the descriptions, but the color of the flower is blue-violet. In the wild the flowering-time is June, but this is probably due to the elevation where they grow, 3,000 to 4,000 m.--extremely high for an iris.

*Reticulata is the accepted name for this section in "The World of Irises," but Mathew in "The Iris" lists this group as Iris subgenus Hermodactyloides, Spach and reports that Rodionenko has treated them as a separate genus *Iridodictyum*. Fritz Köhlein in "Iris" uses this classification and reports that Rodionenko further divides the genus into two sections, *Iridodictyum*, including most of those discussed here and section *Monolepis* which include *I. kolpakowskianum* [sic.] and *I. winkleri*. Discussion, anyone? Ed.

[Your editor is somewhat overwhelmed by the geographic names and apologizes for any mistakes. In the interest of publishing before January, we did little research on the matter. Ed.]

## QUESTION/ANSWER DEPARTMENT

(Answers can be sent to SIGNA editor, address on inside front cover.)

For many years I have grown *I. versicolor* STELLA MAIN as have many others in Region 1--and have used it in my hybridizing program. It is a wonderful sky-blue color, which it often passes on to its 'children.' However, in a listing of all versicolors and versicolor x hybrids, compiled from the Checklist by Marty Shaefer/Jan Sacks of Region one, it is listed as "[1927] Main -- pink to red toned white self." I'd be grateful for any information on this.

Harry Bishop
Massachusetts

**Iris of China** by James W. Waddick and Zhao Yu-Tang . Translation by Youngjune Chang. Timber Press, 1991.

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LATEST BULLETIN
THE IRIS OF CHINA will probably be available by early summer, 1991

# Juno Notes - 1989

(A discussion about Juno Iris) By Alan McMurtrie

In part this is a follow up article to one I wrote for the 1986 Year Book titled: "Have You Ever Thought Of Going To Turkey." That article gave an overview of my travels in Turkey, and focused on an afternoon adventure that led to finding a diploid form of Iris *Danfordiae*.

This article covers the bloom I've had to date from the Junos collected in Turkey, as well as bloom of some lesser known species from Russia. Also covered are: hybridizing results, both from this year and past years; my cultural practices; and a number of observations.

In future I hope to write about some of my experiences with Reticulatas, and talk about hybridizing results with the diploid *Danfordiae*. Yes, it has set seed, and it's pollen was used successfully to make many other crosses.

## Before I Begin...

Before I begin there are a few points I should mention up front.

**The first point concerns terminology.**

(If you find this topic a bit too "technical", please skip on to the second point.)

As many of you know, there are two schools of thought when it comes to Junos. On one hand there is Brian Mathew's view that Junos are closely related to Iris and that they should be treated as a subgenus: Scorpiris. On the other hand is Dr. George Rodionenko who views them as a separate Genus: Juno. I am not a botanist, so I can't offer any further opinion of which might be right. I simply treat each as equally correct.

One thing I do like is the fact that Dr. Rodionenko divided Junos into 3 sections (see his book 'The Genus Iris', translated by the British Iris Society). As I mention later on, I believe there can even be a further division, either as a separate section or as a subsection, based on seed characteristics.

Mathew in his book 'The Iris' says, "...I find it difficult to stop referring to them as 'the Junos'. Since they are so well known in Iris circles as this, I will treat it as a sort of vernacular name without any nomenclature implications!" So too do I.

I must admit, I would be truly hard pressed to refer to the Junos as "Scorpiris" (dam the Rules Of Nomenclature). So, when I speak of Junos, you can either think of it in reference to the genus Juno, or Juno Irises.

There is a similarly confusing outlook on Reticulata Iris. Dykes treated them as a section: Reticulata (incidentally Dykes treated Junos as the section 'Juno'). Mathew treats them as subgenus: Hermodactyloides, though he shows "the 'reticulata irises'" in brackets after that name. Rodionenko treats them as a separate genus: Iridodictyum. Again, I treat each as equally right.

I am happy to call them Iridodictyums, though I tend to refer to them as Reticulatas simply because most people know of them as such. The main problem with this however, is the fact that there is a species called Reticulata. Thus it's sometimes confusing to know whether one is speaking of Reticulatas as a whole, or just the species. To make matters worse, I. *Reticulata* is quite variable in the wild. It's not just the single deep violet-blue commercial form we know so well because of it being grown on a very, very large scale in Holland. So, if one is speaking of the species, are they refering to the species in all it's variations, or just the commercial form?

One further twist of sorts is the fact that many of the hybrids we see listed in nursery catalogues are shown as Reticulata XXXXXX (eg. Reticulata SPRINGTIME); suggesting they are clones of the species *Reticulata*. This is not the case. Many are in fact hybrids involving other species such as *Bakeriana*, or *Histrioides*.

Fortunately when one refers to the species *Reticulata* in text it can be shown in italics to distinguish it from Reticulatas as a whole.

**The second point concerns the climate of Toronto, Canada.**

Toronto's climate is referred to as 'Continental Cool Summer' in "The Times Atlas Of The World". This is defined as: rainy climate with severe winters. The average

temperature of the coldest month is below 0°C, and the warmest month's average is below 22°C. Rain fall in the driest month is more than 60mm.

I would have sworn our warmest month's average temperature is **above** 22°C; which would mean we are 'Continental Warm Summer'.

Spring bloom starts off at the end of March / beginning of April. We can get the odd snow fall into early April, which makes for beautiful pictures of Reticulata Irises poking up through snow. April tends to be a wet month. The saying "April showers bring May flowers" is very appropriate.

During June and July it gets quite hot and dry, with daily temperatures occasionally reaching >30°C. Lawns turn brown as a result. Generally about the end of August fall rains start up. Occasionally we have a snow fall in mid October, but it melts within a day or two.

It used to be that we would get permanent snow in early December, which meant we were assured of having a white Christmas. Now, that is pretty well the exception. Snow stays from the end of December until mid March, with the chance of snow fall into April, as mentioned above. The coldest it gets during winter is -20°C. The past three years have seen spells of warm weather during January / February that melts all of the snow cover. It can be +5°C for several days and then -20°C the next. I lost all of my Dutch Iris hybrids and seedlings to just such conditions!

**The third point concerns a hut I use for growing Junos.**

I grow my 'more difficult Junos', as well as a few of the easy species, in a hut that is approximately 3' high (4' at the centre) x 7' wide x 8' deep. It is constructed of a 2" x 4" wood frame, with the sides covered in metal sheet. The top is open, but during the summer clear plexiglass panels are fastened on top to keep rain off. The clear panels allow sunlight to get to the plants while they are dying down. The panels are removed about the beginning of October.

The hut is filled with about 10 inches of medium coarseness sand.

The idea is for the hut to provide a microclimate similar to what the Junos would experience in the wild.

Note: Acrylic plexiglass panels must be used because of the sun's ultraviolet light. Other types of plastic panels last less than a year because they turn yellow and become brittle.

More will be said about the hut later on.

## Aucheri from Leylek Station, Turkey

The most important news is that two bulbs of the **purple form of Juno Aucheri** from Leylek Station bloomed this year! They were very striking. The colour of each was the same bluish purple. The only obvious difference between the two was some variation in the length of the fall, and the amount of white area around the crest.

I was slightly disappointed with the overall poor bloom on the Leylek *Aucheri* bulbs. Only two other bulbs bloomed, for a total of 4 bulbs out of about 80[1]. I had been expecting a lot more bloom this year; three years after having collected them in Turkey. In a way, all that this is saying, is that my growing conditions are not quite optimum. Right now all of the bulbs are being grown in sand. Half are in the open and the other half are in the hut. The Leylek *Aucheri* bulbs seem to do well under these conditions, but obviously not quite well enough. Later this year I hope to move half of the bulbs to loam soil, where I expect they will do better. I also have my *Aucheri* hort.[2] in the hut. For the past two years none of the ≈6 *Aucheri* hort. bulbs have bloomed. As soon as I saw that was going to be the case again this year, I moved 4 of the bulbs to loam soil, in hopes that this

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1 I was fortunate to be able to collect about 80 bulbs in 1986. The site was extremely heavily populated. It was also the only site where I found bulbs growing in clumps. Each clump averaged about 5 bulbs. Mathew's "The Iris" indicated that colour forms ranging from white to purple could be found at the site. Since the Leylek *Aucheri* wasn't in bloom when I collected it, I hoped that by taking bulbs from at least a dozen clumps, I would in particular get some of the white form and some of the purple.

2 "Hort." refers to the form available in the nursery trade.

would allow the bulbs to increase up to bloom size for next year. The loam soil has helped increase the bulb size of two other varieties over the past year.

Perhaps, since the bulbs have done reasonably well under the sandy conditions, it may just be that they need a slightly longer growing season to bring them up to bloom size. The Toronto climate may not quite give a long enough growing season. This seems to be true in particular of Reticulata iris. We can't come close to getting the size of bulbs that are produced in Holland. My bulbs of GEORGE only bloom every second year (grown in sandy soil).

As a point of interest, several Juno species which are in the hut, have very high bloom to bulb ratios. Ideally, it would be nice if all plants would do well in the various environments we put them in. For Junos, it would be nice if all species were as hardy as *Bucharica* and *Magnifica*. Those two can be grown outdoors under a wide range of soil conditions and they bloom consistently every year. I suppose we have to keep in mind that each species evolved under specific conditions in the wild; some of which were very precise. In order for the plants to do well, we need to duplicate those conditions in our garden. eg. In Turkey Junos tend to be found on barren stony hill sides (ie. good drainage). It has been suggested that some species may be found at certain elevations, and other species at other elevations in the same area.

Interestingly, the Leylek *Aucheri* site is quite unusual in that it is on a flat plain with no hills for miles around! In fact all of the land around is used for farming. The only reason the site still exists is that it contains lots of large boulders that just rise above the surface of the ground. The site is several thousand feet in diameter.

Mathew's 'The Iris' has a picture of the site (plate 28). The water in the foreground is in a ditch-like depression. I was at the site when the stalks were starting to die down. By that time the water had all dried up. There had obviously been a good bloom, but there wasn't one seed to be found. Sheep had likely eaten all of the pods. A shepherd with his small flock went by the site while my wife and I were there.

Not too far away I. *Masia* can be found growing in fields. It survives because it is physically very tough and because it's rhizomes are very deeply seated. The soil seemed to be a very sticky clay. I have been surprised to find that *Masia* is frost tender (probably the reason it isn't available commercially), while the Leylek *Aucheri* is hardy. I'm certainly glad about the later, since it means the Leylek *Aucheri* can be grown outdoors without any frost protection. I do find that before snow sets in it has already grown 2 cm above ground. All other Junos are still below ground, including *Aucheri* hort. By spring, the noses of the other Junos have just emerged, but the leaves aren't yet showing. The Leylek *Aucheri*'s leaf tips are out and have turned yellow from lack of sun. This doesn't seem to really affect the plants because the leaves soon turn green.

By contrast, Reticulata leaves that have turned yellow from being under straw without sunlight remain yellow. Once the leaves have been exposed to sunlight, new growth emerging from the ground turns a nice healthy green.

Of the additional two Leylek *Aucheri* bulbs that bloomed, one was of a pale blue colouring, along the lines of the hort. form (2 bulbs like this bloomed last year), and the other was noticeably paler. Unfortunately, the very pale form had poor substance. The flowers were very short lived (only about a day), compared to several days for the other clones.

Another piece of good news is that I got quite good seed set on the Leylek *Aucheris*. This is in contrast to last year when I got 1 lone seed on 2 bulbs (6 flowers) that bloomed then. This year, out of 12 flowers (3 flowers per bulb), 7 produced seeds. 5 of these were Leylek *Aucheri* crossed with itself (average of 31 seeds per pod). The other 2 crosses involved using pollen from other species, and gave only one or two seeds each:

| | | | | |
|---|---|---|---|---|
| 1 seed | Leylek *Aucheri* - Pale Blue | X | *Persica* |
| 2 seeds | Leylek *Aucheri* - Purple | X | *Bucharica* |

Of the 5 crosses that didn't work, most formed some seeds, but the seeds were hollow. A number appeared to have good embryos, but all lacked endosperm. In future years I will have to see if I can embryo culture the seeds from such wide crosses.

A couple of other Juno crosses gave seeds that were hollow ie. *Bucharica* X *Vicaria* and *Bucharica* X *Albomarginata*.

## First Bloom of 'Graeberiana x Bucharica'

The second most important piece of news is that I got the first bloom on one of my hybrids. One of my *Graeberiana* X *Bucharica* bulbs bloomed. Many of it's characteristics are intermediate to *Graeberiana* and *Bucharica*. A few of these are:

Haft: Semi-winged (*Graeberiana* is winged, where as *Bucharica* is not)

Colour: Pale yellow, with a little "greyed spot" at the very tip of the fall (the effect of *Graeberiana*'s purple on a pale yellow background). Just a hint of purple in the style arms. The crest is yellow, but paler than *Bucharica*'s. A few veins run beside it into the perianth. They start out yellow near the tip of the fall, and change to black beside the crest.

Standards: Pale purple, held horizontal, obovate in shape like *Graeberiana*'s (*Bucharica*'s are lanceolate or three-lobed).

It's an interesting plant, but not very showy. I am looking forward to seeing how the other siblings from the cross compare to this one. Based on it's parents the bulb should do well. As expected, it's two flowers did not set any seed (quite likely it is sterile).

It blooms at the same time as *Bucharica* and *Graeberiana*. There were only 3 days between the start of all three blooming.

Incidentally, the reverse cross, *Bucharica* X *Graeberiana*, does not work. I have tried it many times in several different years, and have never been able to set seed.

## Turkish Juno Bloom

Other Turkish Junos that bloomed included several forms of *Persica / Galatica*:

ANMc2065 Greyed light yellow overall, with the blade of the falls being dark reddish purple. The blade pinches about a day after the flower opens. There is a yellow-orange ridge down the centre of the fall. (*Galatica*)

ANMc2075 Style arms have large branch lobes which are brushed light greyed-purple. falls are off white with grey veins, and a dark greyed-purple blade. An orange ridge runs down the centre of the fall. (*Galatica*)

ANMc2110 Similar to ANMc2065

ANMc2138 Wine red, with a yellow-orange ridge along the centre of the fall. On either side of the ridge the fall is near-white with thin grey veins. (*Galatica*)

ANMc2274 Overall cream. falls have a greyed red purple blade with a white outer edge. There is a prominent yellow ridge on the falls. (*Persica*)

ANMc2288 Off white. The fall has a wine red flush in front of it's yellow-orange stripe. Overall the flower parts are narrow. (*Persica*)

ANMc2298 Grey with a touch of brown. The blade of the fall is dark reddish purple. An orange ridge runs down the centre of the fall, with a white area on either side. (*Persica*)

ANMc2305 Overall light red-brown. The blade of the fall is darker brown. A yellow orange ridge runs down the centre of the fall, with a white area on either side. Quite a lovely flower! Another clone was grey-brown overall. (*Galatica*)

ANMc2314 Off white. The falls have grey veins, an orange ridge, and a dark wine red blade. The very tip of the fall has a 2 mm edge of white. (*Galatica*)

One species that has done very well, as expected, is *Caucasica* subsp. *Turcicus*. I was not lucky enough to collect any *Caucasica* subsp. *Caucasica*, though I tried; I ran into difficulties in both 1985 and 1986. *Caucasica* subsp. *Turcicus* appears to be fairly consistent, with variation only in the amount of green on the style arm rib and in the green dotting on the falls.

Unfortunately, *Pseudocaucasica* has not yet bloomed. Perhaps it will do better in loam soil. Bloom seemed to be sparse in the wild. A blue form of *Pseudocaucasica* bloomed for Maurice Boussard from a bulb I collected. It is overall soft purple with a large yellow blotch around a yellow crest. To the side of the yellow blotch, running down into the perianth, is a white strip. The tip of the fall is solid purple. It is mentioned in the Alpine Garden Society Bulletin (Volume 52 Number 4, page 384), as having won a Preliminary Commendation.

This is a good place to speak about the variation of species. Originally I was under the misconception that some species came in one form and only one form, with only slight variation; and in some cases perhaps 2 or 3 colours. This stemmed from the fact that a lot of species available in the trade are only available in this fashion. For example, there is only one *Aucheri*, three *Bucharicas*[1], one *Caucasica*, one *Graeberiana*, one *Magnifica*, etc. In terms of Reticulatas, generally speaking there seemed to be only 2 colours: wine red, as in PURPLE GEM, and shades of blue that are somewhat similar to one and another. Excluding of course the yellow of *Danfordiae* & *Winogradowii*, and *Bakeriana* (plus hybrids from it), with it's velvety dark purple tipped falls.

In a sense, one thinks that they can grow all of the species that exist of a particular plant genus / subgenus. The reality is quite otherwise. Generally speaking, plants in the wild vary significantly and, so-to-speak, those in commerce form only the "tip of the iceberg". This is actually very exciting. Think of the beautiful things that are just waiting to be discovered. Think of all the beautiful hybrids that could be created ...and when one looks a little deeper, the potential for developing better hardiness, thicker substance, more reliable bloom, etc.

In 'The Iris', Mathew says in reference to *Hyrcana*, "unfortunately only the pale blue form of this has survived in cultivation, giving the false impression that I. *Hyrcana* is always this colour!"

The one thing in particular that "opened my mind" was Martyn Rix & Roger Phillips 'The Bulb Book'. In it they show several collected forms of I. *Reticulata*, and the Junos *Persica* and *Stenophylla*.

Some of the Junos that are just starting to come out of Russia have me wide-eyed staring in awe "...amazing!" Heaven only knows what species they are. In a letter last year Dr. Rodionenko said, "since 1961 28 years have passed. Many new Juno species have been discovered. Currently I know of 45. I must write an article on Junos, but when I can do it, I don't know."

I certainly hope he is able to write something soon!

## Other Juno Bloom

The first Juno to bloom this year was again *Rosenbachiana*, with the first flower opening on April 20th (about a week behind previous years). A total of 5 bulbs bloomed. For the first time I got some seed set on it: once with itself, and once with *Nicolai* (I had tried unsuccessfully for the past two years). Each of those same crosses also failed once. The fifth flower was left unpollinated due to bad weather.

I believe that the success of the crosses, especially in April, is weather dependant. Typically, we get quite wet and damp conditions during April. I know for certain that April 20th, the day the *Rosenbachiana* X self cross was made, was a perfectly bright and sunny day.

Speaking of hybridizing success, surprisingly, two *Graeberiana* X *Bucharica* crosses I made this year failed. I suspect the reason to either be weather related, or due to something along the lines of the pollen or stigma being immature when the cross was made (I tend to make my crosses just as soon as the flowers open).

I should mention that this year I took the anthers off each Juno flower soon after the flower opened, so it is unlikely that bees interfered with any of the crosses. I actually put the anthers in small jars and then worked with the anthers from the jars in doing my hybridizing.

Note: It is important that the jars' lids are fastened loosely so that moisture can not build up and ruin the pollen.

One cross I wonder about is *Bucharica* X *Rosenbachiana*, which gave 2 seeds. This is quite a wide cross. It would be really nice if it were true. I'm keeping my fingers crossed. We'll see what it turns out to be like in 4 or 5 years time. I can't really say that the seeds are, or aren't, any different than *Bucharica* X self seeds. They don't have a white ridge, as is typical of *Rosenbachiana* and *Nicolai* seeds. But then *Rosenbachiana*'s

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1 The three are: *Willmottiana Alba* hort., which is believed to be a white form of *Bucharica* (it is sterile); *Orchioides* hort., which is actually an all yellow form of *Bucharica*; and *Bucharica* itself.

seeds are small (at least this year's were), so I wouldn't really expect them to have much influence.

The second Juno to bloom were two bulbs of *Nicolai*, the first of which opened on April 21st. They were blooming for the first time. There was some variation between the two in the amount of red-black on the tip of the falls. A clone with solid red-black tips was stunning!

The only thing that I don't like about a few species is that their falls pinch after being open for more than a day; which takes away from their beauty. *Rosenbachiana, Nicolai,* and some *Persicas / Galaticas* are like this.

I was pleased to have *Albomarginata* bloom for the second year, and I was especially pleased to be able to set seed on it using five pollen parents:

*Graeberiana* *Kuschakewiczii* *Bucharica* *Magnifica* self (later)

I had selfed it 2 days later in case all else failed, so that I would at least get some seeds. However, I expect it was one or more of the four pollen parents from the first day's crossing, that were successful.

I had particularly good bloom on *Kuschakewiczii*, which I have found to be quite easy. It first bloomed in 1987. At that time I had two bulbs and they both bloomed. Last year I obtained a dozen more, four of which bloomed this year. All told, seven bulbs bloomed, including one I got from an English Nursery as *Albomarginata*. The thing I find most interesting about this species is the variation of the pattern on the fall. Some patterns are quite striking. Thus far I have only gotten one flower per bulb. I will have to try it out in the open in loam and see if it does even better. The two bulbs that started blooming in 1987, have bloomed every year since. This is the performance I like to see!

I am quite interested in a Juno I got from a friend in Czechoslovakia as "*Willmottiana*". It is a fairly clean white with blue veining on the falls, and a yellow blotch around the crest. The veining is quite attractive. It would be nice though if the veins stood out a bit more strongly. I doubt that it is actually a form of *Willmottiana*. I wonder if it is *Tadshikorum*.

A cross of *Kuschakewiczii* X "*Willmottiana*", resulted in 3 seeds. It will be most interesting to see if the siblings end up with some veining. Incidentally, a single seed from *Kuschakewiczii* X *Graeberiana* should also be interesting, since it's quite likely that *Graeberiana*'s mauve will be additive to *Kuschakewiczii*'s dark blue.

This year, for the first time, Potterton and Martin listed *Willmottiana* in their catalogue. No description was given. It was listed in addition to the normally available *Willmottiana* Alba (which is a white form of *Bucharica*). Brian Mathew has mentioned that there are many plants in cultivation under the name *Willmottiana* which are probably forms of *Bucharica*.

I ordered a few bulbs in hopes that it is indeed *Willmottiana*.

This year was the first time that *Orchioides* (true) bloomed (the hort. form is just an all yellow form of *Bucharica*). Five bulbs bloomed, including one from the Göteborg Botanical Garden in Sweden. The flowers are quite strange with their immensely winged hafts. Mine have quite clean flowers, with no hint of purple, as suggested in Mathew's 'The Iris'.

6 seeds from *Orchioides* X *Kuschakewiczii* should be quite interesting, though I wonder if they will in part give muddy siblings... the yellow mixed with blue / dark blue. Time will tell.

One Juno that blooms fairly consistently apparently came from the Kara Kum Desert. I don't know much about it other than I got it from Frank Kalich (he passed away in January), who got it quite a few years ago from Dr. V. Tkachenko of Kirgiz SSR, Russia. Brian Mathew mentions this same Juno under I. *Hippolyti* in 'The Iris'. It seems to be quite sterile, and I very much wonder if it isn't actually a natural hybrid. It's pollen is not consistent, but some grains appear to be complete (ie. the pollen contains a lot of "garbage").

My bulbs haven't multiplied in the 5 years I've had them. Last fall I moved one to loam soil, out in the open. That seems to have really helped it. I just checked and found two bulbs. One is nice and large, and the other is of moderate size.

One other Juno I got from Frank Kalich he referred to as "Blue Bucharica - Stage 1". This he said, was from *Bucharica* X *Vicaria* X *Magnifica*. Unfortunately he couldn't give me any further details. The reference to blue comes from the fact the standards are a

light blue. Frank had said he was also sending me some "Blue Bucharica - Stage 3", which apparently had blue on the falls, but I have come to the conclusion that unfortunately all of the bulbs he sent were of the "Blue Bucharica - Stage 1".

I still keep the bulbs separate, under the names I received them as.

Frank also mentioned, "it seems the more blue I get into this plant, the more sterile it becomes". The "Blue Bucharica - Stage 3" was said to be sterile. He also mentioned, "the plant I got as *Vicaria* has a little blue in it. Crosses made with it failed in most instances, but good on *Magnifica*". *Vicaria* was obviously providing the blue to Frank's "Blue Bucharicas".

It may be that Frank's "Blue Bucharica - Stage 1" is *Bucharica* X (*Vicaria* X *Magnifica* ) because *Bucharica* shows up quite strongly in the seedling. "Blue Bucharica - Stage 3" may have been two generations of back crossing to *Vicaria* to try to bring in more blue.

My *Vicaria*s are quite clean whites, with the only colour being in the lines beside the crest. I bought a couple of bulbs of Vicaria from Potterton and Martin last year which were describe as "pale blue flowers with darker lines and yellow blotch". This is really just a generic description, which leaves me wondering whether they will turn out to be *Vicaria*. None bloomed this year.

*Baldschuanica* bloomed last year, but unfortunately didn't do so this year. I am looking forward to seeing it next year. It was quite striking. One of the two bulbs that bloomed perished. I had tried to cross one flower with *Rosenbachiana* and the other with *Persica*, but neither set seed.

## Juno Culture

As mentioned above, I grow my more difficult Junos in an enclosed hut. In past years I have put the plexiglass panels on the hut as soon as *Rosenbachiana* started to bloom. In some ways this has been quite prudent, because we have had the odd snow fall a week or more after bloom has started. The plexiglass also keeps rain off the flowers for hybridizing purposes. I have been feeling though, that by doing this, it limits the ability of the bulbs to regenerate (regenerate to bloom size, and to the size of being able to form increases). An obvious impact of putting the plexiglass on early is that the ground dries out sooner than it would otherwise, ie. effectively giving a slightly shorter growing season.

This year I didn't put the plexiglass on until the beginning of June when *Rosenbachiana* and *Nicolai* were dying down. What I did to get around the problem of rain affecting blooms for hybridizing, was simply to cover the flowers with pots or dish pans. In general this worked out quite well. The only draw back was that without sun for a few days, some bloom stalks became "leggy". It took them a while to recover. If I had, had two or three times the number of blooms it might have been awkward handling all of the pots. One thing that made things a bit easier was the fact that a number of the species bloom at different times.

I plan to try a number of Juno species out in the open in loam soil. I expect they may do better than they are currently doing in sand. I hate to try this with the one very small bulb I have of *Microglossa*. I very much want to get it up to bloom size, but I don't want to risk losing it. I expect I'll continue to grow it were it is currently, for at least another year, just to be on the safe side.

The idea behind using the hut is that the more difficult Junos tend to rot if they aren't protected from summer rain. At the same time it is usually best to let nature provide the proper growing conditions. The hut allows this by keeping rain off during summer and early fall, and then, once the plexiglass panels have been removed, letting nature start new growth with late fall rains. Over winter snow builds up on top of the ground, ready to provide the burst of moisture needed to allow the bulbs to rapidly leaf out and flower.

As a "just in case" measure, I cover the Junos with 5 to 10 cm of straw. I would be devastated if I had any major losses, and the last few years have seen some very unusual winters; especially where temperatures have risen above freezing for several days, and then plunged overnight to -20°C. As mentioned earlier, I lost all of my Dutch Iris, named varieties and seedlings to just such conditions.

I have found that during the summer the sand in the hut can get quite dry. Last year for example, the sand was so dry that I thought it best to flood the bed with water on two

occasions. I didn't want the sand getting so dry that it would suck moisture out of the bulbs. This year on the other hand, we had some rain during the normally dry spell, so that there was ground moisture 3 inches below the surface of the sand. By the end of August however, the sand was dried out to the point that I was considering flooding the bed so it wouldn't get any drier.

One advantage to growing Junos and Reticulatas in sand is that they are much easier to lift. There is much less chance of roots breaking, and there is very little work required to get the bulbs clean.

Just before I went to Turkey in 1985, for the first time, a beautiful purple *Stenophylla* bloomed. It was quite something to see, especially since shortly I was to leave for Turkey, where I planned to collect forms of *Stenophylla*, plus the related *Persica* and *Galatica*. When I got back home, I was quite disappointed to find that the *Stenophylla* bulb had rotted. At the time I felt it rotted because the Persica group are notoriously sensitive to moisture. But this happened during the growing season, and the *Stenophylla* was in sand (ie. good drainage). Plus, I had set up a plastic sheet over a crude frame to keep the rain off (the hut hadn't yet been built at this point). However, rain could easily have blow in at the sides, and the ground very nearby was unprotected, so the moisture level could have been as high as if there hadn't been a cover.

It's hard to say for sure what caused the rot. From more recent experiences I feel that the problem may have been due to some other cause. At the time, I had even wondered if the rumour that some Junos die after flowering or setting seeds, was the cause. But now I know that isn't true, because I've had bulbs of *Persica* and *Galatica* bloom and set seed, then bloom again the next year (or a year later). The same is true of *Rosenbachiana*, though this is the first year I've set seed on it. The bulbs are all quite healthy. The bulb of *Nicolai* which set seed is also doing very well.

Probably the more difficult Junos appear to die after blooming and setting seed simply because they weren't given proper dry conditions during the summer similar to those they would receive in the wild. The bulbs are likely more susceptible to rot because of having put a great deal of effort into blooming and developing seed, causing them to be weakened.

The experience with *Stenophylla* illustrated how difficult some Juno species can be if not given the conditions they need.

I have had *Aucheri* hort. and *Graeberiana* in the hut because the first year they were to bloom I found that a single bud of *Aucheri* had rotted. Needless to say, I was extremely disappointed. I had been very much looking forward to seeing it in bloom. From the next year on, I covered the Junos as soon as the first one started to bloom. The only exception being *Bucharica* and *Magnifica* which are quite hardy. Now that the hut is pretty well full, I'm going to move out species that should be hardy here in Toronto, to make way for other questionable ones that I'm acquiring.

I do use fertilizer, but it's hard to say whether it makes much difference. Obviously it should, but I've never done a comparison to know how much it does help.

Usually I divide my Junos every 2 to 3 years. I have sometimes wondered if this is a good practice because I feel they don't bloom as well the next year (I have never kept any records to know for sure). In part it seems like a second bulb or a side shoot is needed to help the flowers bloom. Quite likely though, this is just a misconception. It may appear this way because, if one checks bulbs that have bloomed, they find the bulbs often have either "split" into two, or at least have a side shoot (the bulbs don't actually physically split, they just give the appearance that they have). Since I haven't been willing to experiment because of wanting to have good bloom, I've tended to take the conservative approach, and divide clumps leaving either two bulbs, or a bulb and side shoot together.

Interestingly, I have noted that with species like *Aucheri* and *Bucharica*, when they don't bloom, the same bulb simply puts on more growth. This is seen by the fact that the bulb's dried leaf stalk is found attached to the top of the bulb at the end of the growing season. With bulbs that have bloomed, the flower stalk can be found coming up from the basal plate, indicating that the old bulb was transformed into a flower stalk. The bulb puts it's energy into getting the flower stalk up, and all that's left of it are paper thin tunics. The bulbs one finds at the end of the season are completely new. As they form, they push the flower stalk off to the side (in the case of one bulb forming). In cases

where two bulbs were formed, the flower stalk is found attached to the basal plate between the two bulbs. Dr. Rodionenko shows some of this in figure 66 of his book "The Genus Iris".

I found it interesting to note that the leaf stalk of *Aucheri* and *Bucharica* is quite different in appearance to the flower stalk. The leaf stalk reminds me of long stemmed cut flowers in a vase. The flowers arch out from the point where they touch the vase. Leaves on a leaf stalk arch out similarly from the point where they emerge from the

| Pod Parent \ Pollen Parent | Albomarginata | Aucheri | Aucheri - Leylek | Baldschuanica | Bucharica | Caucasica | Graeberiana | Kuschakewiczii | Magnifica | Nicolai | Orchioides (true) | Parvula | Persica | Rosenbachiana | Vicaria | "Willmottiana - Jar" | "Blue Bucharica - 1" |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Albomarginata | | | | | | | √ | | | | | | | | | | |
| Aucheri | | ✓ | | | | | | | | | | | | | | | |
| Aucheri - Leylek | | | ✓ | √ | √ | | X? | X? | X | | | | X? | X | | | |
| Baldschuanica | | | | | | | | | | | | | X | X | | | |
| Bucharica | X? | | X | | ✓ | X | ✘ | X | √ | | √ | X | X | √ | √ | √ | X |
| Caucasica | X | | X | | | ✓ | X | X | X | | √ | X | X | X | X | X | X? |
| Graeberiana | | | X | | ✓ | | ✓ | X | X | | X | | X | | | X | √ |
| Kuschakewiczii | | | X | | | | √ | ✓ | | | | | √ | X | | √ | |
| Magnifica | X | | X | | √ | X | X | X | ✓ | X | X | X | X | X | X | X | X |
| Nicolai | | | | | | | | | | ✓ | | | | X | | | |
| Orchioides (true) | X | | X | | | | | √ | | | ✓ | | | | | | |
| Parvula | | | | | | | | | | | | X | | | | | |
| Persica | | | X | | | | | | | | | | ✓ | √ | | | |
| Rosenbachiana | | | | | | | | | | √ | | | X | ✓ | | | |
| Vicaria | √ | | | | | | X | | | | X | | | | | | |
| "Willmottiana - Jar" | √ | | X | | | | X | | | | √ | | | | | | |
| "Blue Bucharica - 1" | | | | | | √ | X | X | √ | | | | | X | | | X |

**Figure 1 Juno Crosses Tried**

**Legend**

- X Did not work, but possibly may work if conditions are right
- ✘ Definitely, positively, doesn't work
- X? May work. Seeds had no endosperms, but may have good embryos
- √ Works, but not always
- ✓ Very easy cross; though occassionally doesn't work

ground. The Juno flower stalk on the other hand has a very stiff stem onto which the leaves and flowers are attached. One can't help but think of them as looking like corn stalks. Because of the difference between the two stalks, as the bulbs start to leaf out, one can tell which plants will bloom and which won't.

If a bulb is growing poorly, all that happens is that it puts energy into producing a leaf stalk and the bulb is lucky just to replenish itself by the end of the growing season.

One question I'm not yet clear on is whether Junos will bloom the following year if their fleshy roots are broken off. Often, Junos purchased in the trade arrive with no roots. It's hard to fully assess the impact of no roots since there may be other factors involved such as: whether the bulbs were of bloom size to begin with; how early or late the bulbs were planted; whether the soil has lots of nutrients for good root growth; etc.

I hope to try a few experiments over the next year or two to see if I can get an answer to this question.

Each year a new set of fleshy roots is produced at the end of the growing season. The old roots wither, leaving a blackened mass. These accumulate over several years. In the fall, rootlets develop off of the fleshy roots. It is through these rootlets that the Junos are able to pick up nourishment.

One wonders what the purpose of the fleshy roots is, especially since the bulb provides a storage mechanism to allow the plants to survive in a dry climate.

## Juno Hybridizing

Figure 1 shows the crosses I've tried. As you can see a lot were unsuccessful!
Note: crosses involving *Galatica* have been grouped under *Persica*.

The only problem with the chart, is that just the first pollen parent is shown. It may have actually been, that a second pollen parent was successful, and not the first. Thus the chart can be a touch misleading.

I use several pollen parents when making most crosses simply because I don't have enough flowers (pod parent) for all the crosses I want to try. By using more pollen parents I'm hoping that at least one will work. The Junos are so diverse genetically that many inter-species crosses just don't work. The trick is to find out which ones will work. As a result, the highest priority is simply to get seeds. In later years, when I have more of each species I'll be able to afford the luxury of doing crosses using only a single pollen parent. At that time, I'll be able start off with the successful multiple parent crosses, trying each pollen parent separately to see which might have been the successful one. Also, by then the seedlings may have bloomed, which will give further clues to the pollen parent. It takes 4 to 5 years to get flowering bulbs from seed.

The only species of which I currently have lots of flowers, are *Bucharica* and

| #Seeds | Pod Parent | First Pollen Parent | Sec Pollen Par | Third Pollen Par | Fourth Parent |
|---|---|---|---|---|---|
| 10 | Bucharica | Magnifica | | | |
| 35 | Bucharica | Orchioides | | | |
| 14 | Bucharica | Vicaria | | | |
| 10 | Bucharica - yellowish | "Willmottiana" | | | |
| 3 | "Bucharica Stage 1" | Magnifica | Bucharica - yellowish | | |
| 3 | "Bucharica Stage 3" | Magnifica | | | |
| 3 | "Bucharica Stage 3" | Magnifica | Graeberiana | Caucasica | |
| 9 | Caucasica | Orchioides | | | |
| 5 | Galatica (ANMc2075) | Rosenbachiana | Nicolai | | |
| 1 | Kuschakewiczii | Graeberiana | | | |
| 2 | Kuschakewiczii | Persica (ANMc2075) | Persica (ANMc2138) | Persica (ANMc2314) | |
| 3 | Kuschakewiczii | "Willmottiana" | | | |
| 13 | Magnifica | Bucharica - yellowish | | | |
| 30 | Vicaria | Albomarginata | "Willmottiana" | Kuschakewiczii | Aucheri - Leylek Purple |
| 13 | "Willmottiana" | Albomarginata | Kuschakewiczii | Aucheri - Leylek Purple | |
| 15 | "Willmottiana" | Orchioides | Caucasica | Aucheri - Leylek Blue | |

**Table 1 1989 Successful Crosses Not Already Mentioned**

*Magnifica*; especially *Magnifica* with it's 11 to 13 flowers per stalk. With these two species I've been able to repeat a number of the same crosses several times. This wasn't indicated on Figure 1. Before I mark that a given cross definitely does, or doesn't work, I want to have tried it several times, over several years. It may, for example, be a weather related reason that the cross didn't work. For crosses that did work, there is a question of whether the seeds will germinate. Then the next question is was the cross true, or did an insect interfere and cause my *Magnifica* X *Bucharica* to, in reality, be just *Magnifica* X self.

Table 1 shows a list of some of this years more interesting successful crosses that haven't already been mentioned.

## Juno Seed Observations

I have studied Dr. Rodionenko's division of Junos into 3 sections: Juno, Physocaulon, and Acanthospora. I had wondered if a further division could be made based on seed type. Indeed, it would seem that the section Juno can be divided in two: one that has round / square seeds, and the other that has seeds with an aril (see Table 2). It is somewhat difficult to distinguish between round (oval), and square (more specifically: irregularly cubical), because the seeds that are square have somewhat of a tendency to dry to a rounded shape. For the time being I have shown round and square separately below. Further study will be needed.

Interestingly, seeds of the Physocaulon group appear to all have a white edge on them. In literature their white edge is referred to as an aril, but it is quite different from the aril on Oncocyclus and Reglias Iris. The seeds of my new section have a nub which is similar to the aril of Oncocyclus Iris.

One of the biggest difficulties in trying to do a study of seeds is getting material to study. Then there is a question of whether the seeds are correctly named. In order to do a thorough study, seeds of all of the known species are needed. Currently, this is impossible, due, in particular to the war in Afghanistan, but also there seems to be great difficulty in getting material of a number of Russian Junos.

Note: only species that I have good information on are listed in Table 2.

The seed from *Graeberiana* X *Bucharica* looks intermediate to *Graeberiana*'s and *Bucharica*'s. It is noticeably elongated and thinner than *Graeberiana*'s, with a white nub (aril) on one end, which is slightly different in appearance from *Graeberiana*'s.

| | ≈Square (Juno) | | ≈Round (Juno) | | | White Nub (Aril) (Juno) |
|---|---|---|---|---|---|---|
| √ | Bucharica | √ | Aitchisonii | smallish | √ | Albomarginata |
| √ | Magnifica | √ | Aucheri | large | √ | Graeberiana |
| √ | Warleyensis | √ | Caucasica | smallish | D | Linifolia |
| | | √ | Galatica | smallish | ≈ | Parvula |
| | | √ | Kuschakewiczii | | | |
| | | √ | Microglossa | | | |
| | ≈Round (Acanthospora) | √ | Orchioides | smallish | | White Edge (Physocaulon) |
| √ | Palaestina | √ | Persica | smallish | I | Drepanophylla |
| √ | Planifolia | √ | Regis-Uzziae | | √ | Kopetdagensis |
| | | √ | Vicaria | | √* | Nicolai |
| | | | | | √ | Rosenbachiana |
| | | | | | √ | Zaprjagajewii |

**Table 2 Juno Seed Types**

Legend

√ I am confident this is correct
√* *Nicolai*'s seeds are quite distinctly large!
≈ I believe this is correct, but I could be wrong
D From W. Dykes' 'The Genus Iris'
I From 'Flora Iranica (Iridaceae)', by P. Wendelbo & B. Mathew

This spring I noted that I had reasonable germination of my last year's hybrids. Some Russian seeds on the other hand did not show any signs of germination. Likely because they were several years old before I got them. I had been getting the feeling that Juno seeds require at least two years to germinate; which is what I have found to be the case with fresh Reticulata seeds.

I have tried starting seeds in plastic dish pans, but the effort has not been very successful. The reason for using dish pans was one of necessity ...I had no room in the garden at the time.

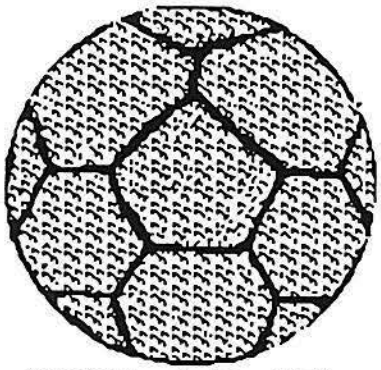
The technique used was as follows: I drilled holes in the sides and bottom of each dish pan for drainage, and then filled the pan with sandy loam soil to within 2 inches of the top. A .25 inch bed of sand was added, onto which the seeds were planted. Another .25 inch layer of sand covered the seeds, followed by .25 inch of sandy loam. The later was in part to help prevent the sand from drying out.

The pans were left on our patio over winter so the seeds would go through a good chilling period. I have had some germination, but it has been disappointingly poor. Some bulbs, notably Reticulatas, germinated last year but did not appear this year. I believe this was because of a cold snap we had this past winter. Seedling bulbs likely started into growth during a warm spell and were lost when the cold weather returned suddenly. I don't know whether this happened to any of the Junos because some did come up this spring. They could either be from seeds germinating for the first time, ones from last year, or a combination of both. I marked the ones that came up and plan to move them to the garden before fall.

As a result of these experiences, I now also cover my seeds and seedlings with straw, "just in case".

## Juno Pollen

This spring I bought a microscope for examining pollen. I had wondered if there are any distinct differences between the various Juno species, like there are with seeds. In his book "The Genus Iris", Dr. Rodionenko recorded three different structures. I found only one. However, none of the species I examined were in Rodionenko's Acanthospora section, or Physocaulon section series Drepanophyllae. Both of these he lists as having different structures from the one I saw. Less than 15% of Juno species are in these two groups, which would account for why I saw only the one structure.



Typical Juno Pollen

All of the species I examined had pollen grains that looked like little soccer balls when mature. This last point is important. It appears that as Juno pollen matures (ie. as it fluffens up), it changes from round spheres to "soccer balls". Once an anther has been removed from a flower and allowed to dry, it's pollen can not ripen any further. Next year, prior to doing any hybridizing, I'm going to check the pollen to ensure that it is mature. Some of the pollen I used this year may have been slightly immature.

The only differences I saw between various species pollen were in the size of their plates. *Bucharica*'s are very large for example, while *Rosenbachiana*'s and *Parvula*'s were much smaller, and thus more numerous. The plates appear to have a "pebbled" surface and are normally 5-sided; occasionally 6-sided.

## New Bulbs From Roots

In the fall of 1986, when I went to plant the Junos I had collected in Turkey that May, I was fascinated to find some roots had started to develop bulbs on their own. This happened on pieces of broken roots that I brought back out of curiosity. The roots were some that had broken off when the bulbs were being cleaned for importing into Canada. They had been well dried and were kept in plastic bags along with the bulbs. Because the bulbs and roots had been well dried I didn't have any problem with them sweating in the plastic bags. They were stored in our house's basement, which tends to be cool. I checked them occasionally, but didn't find any problems.

Interestingly, I also found that some quite badly damaged bulbs of the Leylek Aucheri had root nubs growing out of their base. The bulbs had been damaged when they were dug: their roots and basal plate had been torn off. One of the station masters had helped me dig the bulbs. He didn't realize they needed to be dug carefully and that the roots break easily. He had been loosening the soil around the bulbs using a pick with a broken handle. It only allowed the upper ≈4" of soil to be broken up. The chap then tried to pull the bulbs out, but the roots were still firmly anchored in the ground. As a result, the bulbs tore off just above their basal plates. I spoke very little Turkish, so I couldn't tell the station master what he was doing wrong, but after I demonstrated the way I dug the bulbs up, we proceeded with him loosening the soil and I doing the actual removal.

I had to throw away the most badly damaged bulbs. Some that weren't as bad, but had their basal plates missing, I brought home. It was these that developed lots of new root nubs around the tissue at the edge of where the basal plate had been.

I was quite surprised and happy to see the nubs.

I had heard that by cutting off a Juno root with a bit of the basal plate attached, a new bulb would form. I tried to do just that several times, but I never had any success. The roots just seem to rot. I never found any trace of them in the spring. Obviously I had been doing something wrong. It would seem that the root and plate need to be left in a cool dry place for three to five months. Then, after the new bulb has started to form, the whole thing should be planted. For my tests I had always cut off the root and plate when I dug the bulbs up and replanted them in the fall. I planted the pieces right away after they were cut, because I didn't think they should be allowed to dry out. Now I know the proper way to do it.

It would be a good idea to use a bit of systemic fungicide on the cuts to help prevent infection. Mathew mentions in 'The Iris', "...great care is needed or the parent bulb can be killed by rot setting in to the wounds."

Last fall I received some Junos from Paul Christian that had been packed in plastic bags with some very slightly damp peat moss. The bulbs had started to develop new fleshy roots! Perhaps one could take roots that had been properly dried (ie. their wounds sealed), and place then in plastic bags with slightly damp peat moss to get them to start growing (ie. to form new bulbs).

The following appeared in a recent Alpine Garden Society Bulletin (Volume 57, Number 1, page 10: "Uncover bulbs in mid summer and carefully detach some of the fleshy roots with a portion of basal plate. Put these in warm dry sand at a temperature of ≈22°C. By Sept / Oct a small bulb should have formed which can be grown on to flowering size some four years later".

## Final Remarks

I hope that you've found this article interesting and that it has encouraged you to try some Junos. *Bucharica* and *Magnifica* are the easiest and can be grown pretty well anywhere. If you don't already have any Junos make an effort in 1990 to try a few species / hybrids, such as the beautiful SINDPERS. I think you will find it a rewarding experience.

It's encouraging to see more Juno species becoming available in the trade. I hope this trend continues!

### About the author

Alan lives in Toronto, Canada. In 1978 he graduated in electrical engineering at the University of Toronto. Since that time he has been managing the development of computer application software for Ontario Hydro, a provincial electrical utility. Partly as a result of working in an office all day, Alan developed a keen interest in gardening. His main interest is Iris (particularly Junos and Reticulatas), although he is also quite interested in bulbs; from Crocus to Erythroniums, to Tulips, etc. He says, "Iris are especially fascinating because of the tremendously different types: from Arils, which want desert-like conditions; to Dwarfs and Tall Beardeds, that are very easy to grow; to Japanese and Louisianas, which want moist conditions; etc. And then there is the fun of hybridizing, including intercrossing some of the different types."

Alan and his wife Lynda have a one year old son, Jeffrey.

# 1989 TREASURER'S REPORT

| RECEIPTS | | DISBURSEMENTS | |
|---|---|---|---|
| Membership | $ 1,994.44 | Publications | $ 150.00 |
| Publications | 10.00 | 'SIGNA' | 2,100.00 |
| Seed Exchange | 1,308.50 | Officer Expenses | 141.27 |
| Donation | 300.00 | China Project | 750.00 |
| Interest | 241.20 | Miscellaneous | 103.40 |
| Total | $ 3,854.14 | Total | $ 3,244.67 |

| | |
|---|---|
| Cash in Checking | $ 5,412.77 |
| Time Deposits | 9,241.20 |
| Total Assets | $ 14,653.97 |

# FIRST HALF 1990

| RECEIPTS | | DISBURSEMENTS | |
|---|---|---|---|
| Membership | $ 1,293.15 | Seed Exchange Mailing of List | $ 507.98 |
| Seed Exchange | 1,267.00 | Translation of Chinese Iris Text | 500.00 |
| Interest | 481.19 | Preparation of Portfolio | 4,352.85 |
| | | 'SIGNA' | 1,000.00 |
| | | Officer Expense | 95.06 |
| Total | $ 3,041.34 | Total | $ 6,455.89 |

| | |
|---|---|
| Cash in Checking | $ 1,519.03 |
| Time Deposits | 9,722.39 |
| Total Assets | $ 11,241.42 |

## EDITOR'S COMMENTS

So many new things are happening with SIGNA--the portfolio of Jean Witt's watercolors being the most exciting and now complete. We're also excited about the proposal for species awards and think even more species and hybrids will be selected and introduced when decisions are made and awards forthcoming. We hope many more ideas and suggestions will be received from the membership--names, rules, standards, etc. will need to be decided on. You may, of course, send your ideas directly to Bob Pries, but your editor would welcome being used as a forum for exchange of these with other members.

We have received a request from publishers Stewart, Tabori & Chang for suggestions of gardens which highlight special collections of species iris.. They will be publishing in 1992 a series of books entitled GARDENS IN AMERICA OPEN TO THE PUBLIC. If anyone has suggestions, their rep is Mary Jenkins, 32 Moses Lane, Southampton, NY 11968. Additionally this brings up another idea the membership might want to consider--Display Gardens. Anyone want to follow up on that one?

Colin has mentioned and I think I should repeat--we will need a new Seed Exchange Director for the coming year. It is interesting, educational and requires some available helpers, especially for the packaging--perhaps your local iris society would be interested! Another job that someone could ease into for the next year or two is the editing and publishing of this publication. Ideally someone with desk top publishing equipment could take over and do a better job than anyone so far. For most Section publications, getting material is the big problem, but not so SIGNA. There is a wealth of material out there just waiting to be used.

Speaking of the Seed Exchange, I want to share some of my successes from last year's bloom season. The most interesting were several I. laevigatas from seed sent by Eberhard Schuster in what was East Germany. Among them was a lovely pale lavender double, unlike any laevigata I have seen before and a lovely white single with purple only on the style arms. Among a group of I. lutescens seedlings, many of which appeared to have gotten chummy with an aphylla was a nice small dark violet and a nice small clean light yellow. My one I. tenax seedling was not much like any tenax I have seen before but very pretty besides having five flowers on its one stalk! It bloomed for a long time and formed empty seed pods. I. ensata hortensis from Korea had the tallest stalks I have ever seen on any ensata and was otherwise similar to the dark violet forms usually sold as the species. Many worth saving I. setosas as well as sibericas, sanguineas, and chrysographes section species and hybrids also produced first bloom. Most of the spuria species and a few other seedlings have yet to bloom. I. koreana proved to be a miniature siberian type and not that species, but it might be interesting to those interested in miniature siberians. Also seed labeled I. siberica from Poland proved to be garden-type siberians, but a couple of very interesting ones, a pale lilac and a pale lilac and white bicolor. If you haven't yet tried the Seed Exchange, you're missing a lot of fun.

Joan C