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*'Fairy's Fairy (R. Keiskei 'Yaku Fairy x R. Keiskei)
clor 1C to 3C. Photo by Barrie Porteous*

Rhododendrons are a common sight in Edinburgh. Almost every garden seems to have a few, the woods are full of *R. ponticum* and some of the finest species and hybrids grow at the Botanical Gardens which are located several miles from where I used to live. It was hard to imagine a landscape without rhododendrons. That, however, was exactly what I found when I emigrated to Canada in 1968. In retrospect I should have headed west to Vancouver but, Toronto offered the best opportunities for work and I settled there. The prospect of long, hot Canadian summers and plenty of winter skiing seemed an attractive alternative to eastern Scotland's cold, damp summers and even colder, damper winters. Rhododendrons, I was told,

did not do well in Ontario.

Certainly a few iron clads could be purchased from local nurseries and 'PJM' seemed to flourish, but there was not the wealth of colour and form which I was used to seeing. Some optimistic and, doubtless, wealthy growers tried importing plants from the west coast but invariably a tender rhododendron in Toronto is usually a dead rhododendron by spring. Just as I was convincing myself that marigolds and petunias were the plants for me, I was fortunate to meet Joe Brueckner and things, rhododendron wise at least, took a turn for the better.

Dr. Brueckner was born in the Austro-Hungarian monarchy and developed an interest in rhododendrons during his visits to the Alps. In the late 1940's Joe, with his wife Martha, left Hungary for Switzerland and, after two years, emigrated to New Zealand. Several years later they settled near Saint John, New Brunswick, in Canada, where, in spite of the proximity of the Atlantic Ocean, winters are bitterly cold.

During his stay in Switzerland, but more especially in New Zealand, Joe became very interested in rhododendrons. He was determined to grow them in New Brunswick but recognized that there was no information available on raising plants in such a hostile climate. Some of the local gardeners had tried a variety of English hybrids with remarkably consistent results. Every plant died. In spite of this Joe felt certain that rhododendrons could be grown successfully in the area for, after all, they are to be found in nature in the tropics and the arctic and many places in between.

The first approach involved the raising of plants from R.H.S. seed and, although some successes were achieved, the results were not altogether satisfactory. It was at this time that fate intervened. Among the inhabitants of Saint John, who were treated to visions of dead and suffering rhododendrons, was a local gas station attendant. He remembered regularly filling up a converted Volkswagen mini-bus which looked very much like a greenhouse on wheels, loaded to the brim with rhododendrons. As it turned out, the van belonged to one of Canada's premier rhododendron hybridizers, Captain Dick Steele. A meeting was arranged and before long Captain Steele had explained the fundamentals of his hybridization program and the methods he used to select crosses and grow on seedlings.

Armed with this new knowledge Dr.Brueckner, at age 56, began to make his first crosses utilizing 'Mars' and *R. maximum*. Nothing especially significant was achieved and subsequently none of the plants showed the degree of hardiness necessary to insure success in New Brunswick, however, it was a start. Rhododendron maxi-mum was soon abandoned as it yielded inferior hybrids which seemed to be happy only within certain restrictive growing conditions.



'Nahanni' (*R. Racemsum* x *R. lapponicum*), colour 74C shading towards 78B. Photo by Barrie Porteous.

The following year crosses were made using 'Ice Cube' and the Exbury form of *R. yakushimanum*, which generated very interesting plants with definite cold tolerance. Subsequent observations have shown that the Exbury form imparts a much greater degree of cold hardiness to its off-spring than could be expected. Many other hybrids were tried but only 'Mrs. C. S. Sargent' was hardy.

The problem was, of course, where to start? Inquiries at the major nurseries yielded nothing of value. Arboretums were also of no help, in spite of the fact that collectors such as Rock, who explored in the Kansu region of northern China, had sent back seeds and plants of hardy species.

The first breakthrough came when Joe wrote to Dietrich Hobbie and discovered that he had visited the Great Slave Lake region of Canada's Arctic. It was there that an erect growing lapponicum had been located by him which, at a height of close to 20 inches was clearly not covered by snow at times during the winter months. Arrangements were made for plants to be collected and sent on to Saint John. The second interesting development came when Vladimir Vasak, a

Czechoslovakian botanist, was contacted. Vasak had collected in various parts of the USSR and had obtained seed and plants of *R. dauricum* and *R. aureum*. One of the dauricums collected northwest of Lake Baikal was used in some of the crosses. *Rhododendron ledebourii*, which is probably just a local variant of *R. dauricum* var. *sempervirens*, was also collected by Vasak in the Altai Mountains at the Kadrin River, and promised to have great potential as far as contributions to hardiness and quality were concerned. It was some time before *R. ledebourii* could be used in the program as it took several years to grow on plants to flowering size from Vasak's seed. Possibilities for the production of cold tolerant lepidote hybrids were enhanced with the discovery of literature dealing with a hardy form of *R. brachycarpum*. During the Japanese occupation of Korea, seed of various trees and shrubs had been collected by the Japanese Department of Forestry. Dr. Tigerstedt, in Finland, had obtained seed of a particular form of *R. brachycarpum* which had been collected from the northern part of Korea and he observed that the resulting plants were hardy, tolerating -45 degrees Fahrenheit. Frequent attempts were made, by Joe, to locate Dr. Tigerstedt's *R. brachycarpum* or to obtain seed though none were successful. Fortunately it was discovered that Orlando Pride had managed to obtain seed of *R. brachycarpum* from Finland, possibly from Dr. Tigerstedt himself, and a small seedling was sent on to Dr. Brueckner. Shortly afterwards, Pride destroyed all his *brachycarpums* presumably because they didn't do as well as expected. At a later date Nitzelius described *R. brachycarpum* ssp. *tigerstedtii*, and quantities of seed, as well as pollen, were also obtained from him. The basic ingredients for a successful lepidote and elepidote hybridization program were now in place. Apart from those mentioned, a number of other hardy species and hybrids were also used. Innumerable crosses and attempts were made over the years resulting in some 800 seedlots, about 2/3 of which germinated.

LEPIDOTES

R. lapponicum: In winter, temperatures in the Great Slave Lake area can drop to -70 degrees Fahrenheit. Desiccating arctic winds are common and, as a result, most plants seek refuge under snow. Although the average snowfall is in the region of 40 inches per year, the actual accumulation is significantly less. Typically, *R. lapponicum* grows to only several inches in height

and is a prostrate, compact, branching shrub. At 20" in height, the form originally discovered by Hobbie, on the south-east side of Great Slave Lake, must spend a large part of the winter exposed to the elements and can thus be considered exceptionally hardy. The flowers are somewhat larger and redder in hue than the type and the leaves are slightly longer. Young shoots from around the base of the plant may grow 3 to 4" in one season with terminal shoots on older branches growing at a rate of between 1/2 - 1". Flowering, in New Brunswick, takes place in early May and by early summer seed capsules are well developed and the following year's flower buds are set.

With the onset of winter, the leaves completely dehydrate and can be rubbed to a powder between the fingers, making it seem as though the plant has died. This appearance continues even through mild spells in winter and usually well into spring at which time the leaves fill out and the plant resumes normal growth. It seems likely that this dehydration mechanism is the reason that the plants can survive the harsh conditions in their native habitat.

Pollen, first collected in 1969, was used to make a number of hybrids but only a few were successful as they were very difficult to cross. None of the original plants of the Great Slave Lake lapponicum have survived in Toronto due to the hot summers and relatively mild winters, however, some very interesting hybrids have been produced.

This species, or at least the type that Dr. Brueckner is working with, was not the easiest subject for breeding purposes. The flowers are frail and easily break off on emasculation. In addition, there is also scant production and supply of pollen. Of the hundreds of individual attempts which were made, only a few proved successful and, in the end, 19 hybrids were obtained. Few of these have an overall garden value as they prefer cool and moist summers. However, crosses with *R. racemosum* (named 'Nahanni'), *R. calostrotum* 'Gigha', *R. carolinianum* (interestingly the hybrids of the white form seem to be more resilient than those of the pink form) as well as *R. chryseum*, *R. dauricum* and 'Ptarmigan', where *R. lapponicum* was the seed parent, all have merit.

R. dauricum

Both *R. dauricum* var. *sempervirens* and *R. ledebourii* are non-deciduous and grow to between 7 and 8 feet after 20 years. Flower colour is purple with a touch of pink, although *R. ledebourii* tends to be a little warmer. The original *R. dauricum* var. *sempervirens* was obtained from Moscow by David Leach, who gave it to Peter Cox, who gave it to Joe. It is a well behaved plant and is considered to be attractive all year, however; its most important contribution is its ability to pass on its cold hardiness to its off spring, but comparatively little of its morphological properties. The size and growth habit of the other parent, the foliage, the size and colour of the flowering come through in the hybrids to a marked extent. Because of their early flowering, *R. dauricum* var. *sempervirens* and *R. ledebourii* were mainly used as pollen parents in the hybridizing program. Both species performed equally well in Saint John and in Toronto. Deciduous *dauricum* (type) as well as several other forms, such as the white form from Hokkaido, were also used. *Rhododendron dauricum* proved vastly easier to work with than did *R. lapponicum*. As a rule, and with only a few exceptions such as *R. dauricum* var. *sempervirens* x *R. moupinense*, *R. dauricum* was the pollen parent since it is one of the earliest flowering rhododendrons. Of the numerous crosses selected for long term evaluation the following hybrids have proven to be most interesting. 'Azuray', a hybrid of *R. augustinii* x *R. dauricum* var. *sempervirens*, is a large, robust, very resilient and hardy bush. The flowers are similar to *R. augustinii*, in that they are large and open, however, the flower colour tends toward a light violet blue. The new shoots are distinctly yellow and provide an added dimension to the plant. 'Audacious' an open pollinated seedling of *R. dauricum* var. *sempervirens* is, after 12 years, 7-8 feet tall and just as wide. It is one of the first plants to bloom in the garden and the large lavender pink flowers stand up to full exposure to sun and are not affected by early frosts. In addition, it has bloomed every year without fail, even when 'P.J.M.' was nipped by late frosts.



R. x nikomontanum x R. forrestii repens, orange-red to yellowish semi-double. Photo by Barrie Porteous.

Rhododendron dauricum album crossed with R. fletcherianum has yielded a low to medium sized plant with lovely dense foliage which is attractive all year round. The buds, which are apricot pink, open to large white or creamy white flowers, suffused with pink in the initial stages.

Miscellaneous Lepidote Hybrids

'Fairy's Fairy' is the name for R. keiskei 'Yaku Fairy' crossed with a hardy form of R. keiskei. The shrub is a dense, flat, very low bush with deeper yellow flowers than those of R. keiskei 'Yaku Fairy'. In addition, the plant has come through many severe winters whereas R. keiskei 'Yaku Fairy' generally succumbs.

Rhododendron carolinianum album crossed with (R. chryseum x R. lutescens) is a low shrub with bright yellow, ball-shaped flowers. Both the white and pink forms of R. carolinianum have been crossed on to R. chryseum with good results, (R. chameunum x 'Cutie') yielded a nice plant with good pink flowers and a red flare.

ELEPIDOTES

R. aureum

Rhododendron aureum is mentioned here, not because of any successes achieved in growing either it or its hybrids, but because it failed dismally. Seed collected from the Baical Sea, Kamchatka and also from Japan produced plants which simply disappeared from the garden in Toronto. The only successful cross, out of the many that were tried, was R. catawbiense album x R. aureum. Further attempts were therefore abandoned in spite of the obvious contributions to hardiness which R. aureum could potentially make. Rhododendron x nikomontanum, a plant which is hardy in both New Brunswick (snow cover?) and Toronto, has proven to be a reasonable substitute, contributing both hardiness and compactness to its offspring. The original plant, obtained from Hobbie, is low growing, spreading out rather than up, and has a pale yellow flower with a greenish yellow blotch. Joe has some doubts as to whether or not this form is pure R. x nikomontanum, however, the flower does correspond as typical of the type according to descriptions by Japanese authorities.

R. brachycarpum ssp. tigerstedtii

Rhododendron brachycarpum ssp. tigerstedtii is known to be hardy to -45 degrees Fahrenheit and the original plant is now around 8 feet tall and 12 feet wide, after about 23 years from seed. Growth is initially very slow; however, this form eventually becomes a large, spreading bush, as wide as it is tall. Even in New Brunswick, it needs a fair amount of shade as the plant will tolerate very little sun. The flowers are white, relatively small and with a greenish blotch, not unattractive but certainly humble. The flowering period varies greatly depending on the weather, but R. brachycarpum ssp. tigerstedtii can be considered a medium bloomer. Certainly one of its great attractions is the foliage and in a wet year leaves are produced which are noticeably longer than those formed in a dry year. They are also very sensitive to weather conditions and will curl up, on a cool night, long before any of the other species.

From a large number of crosses over 60 hybrids were obtained, including a few F2, second generation crosses. Of all the partners with which this rhododendron has been paired, the following have proven to be the most promising.

Species: *R. catawbiense album*, *R. catawbiense album* 'Catalgla', *R. cerasinum*, *R. williamsianum*, *R. forestii* var. *repens*, *R. smirnowii* and *R. arboreum*.

Hybrids: 'Janet Blair', 'Mars', 'Pinnacle', 'Rodhatte', 'Elizabeth'.

Crosses with 'America' and 'Nova Zembla' led to vigorously growing, robust plants which were rejected, as flower quality, in the first generation at least, was poor.

All of the *R. brachycarpum* ssp. *tigerstedtii* crosses have proven to be leaf hardy in Mississauga and, with one or two exceptions, bud hardy. Most notable of the exceptions are crosses which involve 'Elizabeth' but even here second generation hybrids have shown a few hardy clones. The *R. arboreum* hybrids, from crosses made in 1978, have yet to flower.

Only *R. catawbiense album* 'Catalgla' x *R. brachycarpum* ssp. *tigerstedtii* has been exposed to temperatures as low as -35 degrees Fahrenheit. While the plant flowered without any bud or leaf damage it should be noted that it has not been subjected to any long term testing.

R. yakushimanum, Exbury form *Rhododendron yakushimanum*, has been established as a parent which lends hardiness to its offspring beyond expectations. A cross made in 1969 with 'Ice Cube' yielded a number of very satisfactory clones. Those that have been named are 'Albula', which has large ball shaped trusses, 'Igloo', which is a rounded bush always covered in flowers, and an as yet unnamed clone with spotless white flowers. All open from pink buds and have dark green leaves which are retained for 4 or 5 years. The clones are generally more vigorous than *R. yakushimanum* and 'Albula' is now 5 feet tall and 6 feet wide after 20 years, while 'Igloo' is 6 feet tall and 6 feet wide. This particular cross is a good example of the contribution which *R. yakushimanum*, Exbury form, makes towards increased hardiness. All the clones are sensitive to sun and should be grown in full to light shade where they will put on an impressive display of bloom every year. A number of interesting hybrids resulted when (*R. yakushimanum* x 'Mars') was crossed back to 'Mars'. All have red coloured flowers, some with most unusual tints. The names for two of these clones are 'Hot Dawn' and 'Ma Chere'. It is interesting to note that while 'Mars' is hopelessly tender in the Toronto area, all of these clones have flowered every year with absolutely no damage.

R. catawbiense compactum and miscellaneous hybrids When *R. catawbiense compactum* was crossed with *R. yakushimanum*, Exbury form, clones were produced which gave very hardy, well rounded bushes with good foliage. With two exceptions the flowers open from pink buds and then turn white. Not as hardy, but with a pleasant light yellow colour, are clones of (*R. faurei* x 'Inamorata') x (*R. wardii* x *R. brachycarpum*). They started flowering several years ago and have done so every year since, without damage. The same may be said of 'Lionel's Red Shield', a hybrid originating from a cross of 'America' x 'Carmen'. Ten-year-old plants are about 1 foot high and 3 feet wide with vivid clean red bell shaped flowers.

Summing up, the Brueckner garden is located in Mississauga which lies at the southern periphery of the greater Toronto area. It has noticeably milder winters than communities bordering Toronto to the north. Even so, since the time that Joe began the garden, temperatures as low as -25 degrees Fahrenheit, (in 1981) have been experienced. Last winter was relatively mild with a minimum of -9 degrees Fahrenheit, although there was no snow on the ground until well into March.

Testing for hardiness involves so many variables that it is hard to state categorically that a plant will survive, anywhere in the country, down to a certain temperature. Nevertheless, it is possible by comparing how existing varieties do, to say that a plant is better. There is no question in my mind that Joe has hybridized some superb, hardy plants, which offer gardeners in Eastern Canada, and elsewhere, an opportunity to grow rhododendrons just like 'back home'.

The author: Barrie Porteous, a member of the American Rhododendron Society, served as editor of the Bulletin of the Rhododendron Society of Canada from 1984 through 1989.