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Front Cover
'Virginia Delp', *Kristin x Calsap,* A.W. Smith Seedling hybridized, grown and selected at his Dorchester Road home .

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Aerobic Requirements in Culture of Rhododendron Albiflorum Roots

By Nancy Halas

Because of its challenge in culture, it has been interesting to study and experiment with Rhododendron albiflorum. This species presents something of an anomaly, since it is very common where it is native but has not been successful in garden culture, so far.

All I could ever obtain, and that with difficulty, were seeds of Rhododendron albiflorum - certainly no live plants were ever available to me in spite of continued attempts to obtain one.

In experimenting, what I did discover was that the seeds germinate easily and are not difficult to handle. However, following germination, the seeds failed to grow and remained stunted. As is the case in all chance discoveries, I nearly by-passed the observation that there is a natural condition under which the seedlings thrive. I had for comparison different and separate methods of growing the seedlings; bearing in mind the old adage about not putting all my eggs in one basket, I mixed the plantings as much as possible instead of putting them into one pot. I used large 15 inch diameter pots, in a controlled environment. If I intended to experiment, I thought, the whole idea was to proceed with confidence and assume that you would, of course, succeed.

Of the six pots, the seedlings in five failed to thrive. They germinated quickly but then stagnated. Afraid to introduce a variable into the experiment, I did not fertilize.

The sixth pot of seedlings thrived and grew healthy, although they received nothing more than water and light. That is, I reasoned, all that a plant receives in the wild. The contrast between the five pots of stunted seeds and the one batch of thriving seedlings was startling.

I tried to decide why the seedlings were able to grow in one pot, but not in the other five, when all conditions were the same. The only difference that I could observe was in the method of root feeding. In the successful pot, there was what I believed to be aerobic feeding of the roots.

There are bacteria in the air which precipitate waste products in organic matter into minerals and more easily assimilable sludge of a sort. The principle is common in the treatment of garbage in waste disposal plants where nothing more than air is bubbled through waste water to precipitate the solids, separate minerals and ions from the waste material and remove the sludge. It appears that Rhododendron albiflorum takes advantage of this type of feeding.

The more common type of Rhododendron feeding is by mulching, which provides anaerobic germs that live without free air or oxygen

to precipitate the minerals and sludges from the organic matter in the mulch. This is very successful for most Rhododendrons, but will not be successful for Rhododendron albiflorum, from what I have observed.

In the presence of aerobic precipitation of the food that Rhododendron albiflorum needs, it simply starves to death. We always say that it grows very slowly, much like children that are undernourished. Whether we can successfully simulate the root culture that the Rhododendron albiflorum needs to grow in our gardens, is still an open question.

Mules of the Ericaceae World

Barry N. Starling, England

reprinted with permission from The Dunedin Rhododendron Group Bulletin, New Zealand

In the animal kingdom, ancient mythology has used the theme of combining man with other animals to create beings of exceptional form and character like the Centaur - half man, half horse; or, more recently, science fiction has produced monsters from similar themes. Remember the Triffids which supposedly spanned the gap between plant and animal kingdoms? Fortunately bigeneric hybrids within the family Ericaceae are (so far!) quite benign.

Given the many thousands of rhododendron hybrids that already exist and the almost unlimited potential for creating still more diverse crosses between species as yet unused, even the most ardent rhodophile might balk at the idea of introducing allies general to the Rhododendron. However, such alliances have already taken place with interesting results.

It was over twenty years ago that the first bigeneric hybrid involving rhododendron caught my eye. This was *R. macrophyllum x Kalmia latifoia*, a metre-high monster with contorted dark leaves and never a flower. Characteristics of both Rhododendron and Kalmia parents were evident but there was little desire on my part to find garden space for this oddity.

More recently I have become acquainted with a hybrid raised in the USA by Halfdan Lem in the 1950's. This is *R. williamsianum x Kalmia latifolia* and once more the blood of each parent is apparent in the offspring but to infinitely more beautiful effect. Trusses of flush-pink to white, wavy-edged saucer-shaped flowers are borne over foliage which owes most to the pollen parent, *R.williamsianum*. A long, curving style adds only elegance to each bloom as it is completely without function, the hybrid being quite sterile. The sterility of most bigenerics means that it is not possible to go to the F2 generation and thereby explore a range of seedling variations between both parents. As compensation, an advantage of sterility is that, whereas most flowers are very quickly pollinated after the buds open (in the case of rhododendrons the corolla usually drops within twenty-four hours or pollination), the sterile flowers of bigeneric hybrids will last in good condition for very much longer - sometimes as much as one month.

The as yet unnamed *R. williamsianum x K. latifolia* hybrid inherits from its *Kalmia* parent an unwillingness to root from cuttings and my only successful propagation to date has been by summer grafting on to *R. williamsianum stocks.*

Two further bigeneric hybrids involving Rhododendron originated from the USA. The first is a cross between *R. 'Elizabeth'* and *Ledum glandulosum x Ledodendron 'Brilliant'(1).* There is little evidence of *Ledum* apparent in the hybrid but certain of its features do indicate "long-distance" hybridity. It is sterile and the clear red corollas are often split and distorted. Stamens vary in number and in the length of their filaments; styles likewise may be short, long, twisted or even absent but for a rudimentary protrusion.

In appearance *x Ledodendron 'Brilliant'* is like a less vigorous *R. 'Elizabeth.'* Probably it was named for its new growth which emerges bronze-red, lighting up the small shrub throughout its growing season.

The second hybrid is one in which the two parents from separate genera are already superficially similar. *Rhododendron trichostomum x Ledum glandulosum* has given us *x Ledodendron 'Arctic Tern'(2)*, with multi-flowered pom-poms of tiny corollas of an incredible whiteness. Here the affinity with both parents is more obvious, the habit and foliage owing most to *Ledum* while the flower structure and greater substance to the corollas reflects the rhododendron parent. Cuttings root readily but can give rise to a very leggy shrub unless the growing point is pinched out after potting and then subsequent shoots are also pinched back for the first two years to establish a bushy framework.

Bigeneric hybrids within the family Ericaceae are nothing new. As long ago as 1845 *x Phyllothamnus erectus* was introduced from a liaison between the delightful but difficult European alpine shrublet *Rhodothamnus chamaecistus* and the western American *Phyllodoce empetriformis. x Phyllothamnus* has bright pink funnel-shaped flowers intermediate in size between the two parents and far more readily produced. Its bright green leaves are closer in shape to *Phyllodoce* but are longer and a little broader.

In 1960 a small, free-flowering shrub in Hillier's nursery first attracted attention, apparently as a form of *Kalmiiopsis leachiana.* Over the next decade, its identity was questioned on a number of occasions and material was finally sent to Dr. James Cullen at the Royal Botanical Garden, Edinburgh. After examination Dr. Cullen concluded that this was a bigeneric cross between *Kalmiopsis leachiana* - the type form from Curry County, Oregon - and *Phyllodoce breweri* from the Sierra Nevadas of California. It was a cross which could not have occurred in the wild so that the origin of the plant was something of a mystery. In April 1976 the hybrid received an Award of Merit from the Royal Horticultural Society and was formally named *x Phylliopsis hillieri 'Pinocchio.'* It has since gone on to receive a First Class Certificate, the RHS' highest accolade of merit.

'Pinocchio' is a sturdy little shrub, evergreen and well-clothed with bronze-tinged, oblong-obovate leaves which can be up to 2cm long,

8mm broad, but are usually a little smaller. Flower buds open over several weeks. They are borne in elongated racemes, the funnel-shaped corollas of about 1cm diameter opening from the lower end first. They are bright rose-pink and can easily hide the foliage completely. Cuttings root fairly readily in cool conditions but young plants must be pinched out to counteract a tendency to legginess. Pruning back of flowering shoots as soon as flowers have faded will also help to maintain bushy, compact plants. At first, young specimens will flower spasmodically throughout the year but after two or three years will settle down to a prolific display each spring.

'Pinocchio" is not entirely sterile, and occasionally a fertile seed is set. From the first of this seed to be sown an incredible little shrub has been raised. Just one seed germinated, the resultant seedling growing away strongly to produce a replica of the *Kalmiopsis* parent except that it is considerably larger in leaf and flower and has blooms of much deeper pink than most *Kalmiopsis*. It is proving to be a good garden plant and bears the cultivar name *'Hobgoblin.'*

Intrigued by 'Pinoccio' I set about making my own *Kalmiopsis Phyllodoce* cross. *Phyllodoce empetriformis* was used as the seed parent and the more compact *Umpqua* form of*Kalmiopsis leachiana* provided the pollen. In due course, four seedlings far outstripped others in the pot in vigour and when the four eventually flowered there was little to choose between them. It took several years of trial before one was selected as having greater all-round merit than its sisters.

It was Roy Lancaster who, in naming *'Pinocchio'*, had published the generic name *x Phillíopsis* for hybrids of *Phyllodoce* and *Kalmiopsis*. This name, of course, could be applied to my hybrid though the specific epithet *hillieri* did not apply as one of the parents was a different *Phyllodoce* species from that of *'Pinocciho.'* So far my hybrid has no specific name but is identified by the cultivar name *'Coppelia.'*

'Pinocchio' had appeared in Hillier's nursery out of the blue in much the same way as the puppet of the children's story from whom the name was taken. Coppelia too was a puppet or doll, the creation of the eccentric old Dr. Coppelius. Certain parallels seemed evident and as the music of the ballet Coppelia is among my favourites the new hybrid became *x Phylliopsis 'Coppelia.'*

'Coppelia' is just as showy as *'Pinocchio'* with a long-lasting display in spring and often again in early autumn. Its multi-flowered racemes are composed of cup-shaped corollas about 1cm in diameter, deep pink with a hint of lavender. The leaves are more like those of a large *Phyllodoce* but bear on their lower surfaces the characteristic glistening glands of a *Kalmiopsis* leaf. It makes a dome-shaped shrub no more than 30cm high with an ultimate spread of perhaps 50cm. In the

spring of 1982, *x Phillíopsis 'Coppelia'* received an Award of Merit from the RHS.

Still fascinated by *Kalmiopsis* and its relationship with other *Ericaceae,* I attempted a cross with *Rhodothamnus chamaecistus*. Using *Kalmiopsis* as the seed parent yielded nothing but the reciprocal cross gave nine seedlings ranging from almost pure *Rhododthamnus* to plants with characteristics midway between each parent. In one respect they are better garden plants than either parent - they are much easier to grow. They have the floriferousness of *Kalmiopsis* with wide open, clear pink flowers of over 1cm diameter in most seedlings.

Rhodothamnus chamaecistus is found on limestone alps in exposed situations. Its flowers are usually up to 1.5cm in diameter, clear pink but less commonly a form with smaller flowers each with a distinct red eye occurs. It was this latter form that I used in the cross and the red eye is evident in most of the seedlings. Its resemblance to a bird's eye struck me and inspired the specific epithet *ornithomma*. Using the usual procedure for generic names of bigeneric hybrids these plants have now become *x kalmiothamnus ornithomma*. Four of them have received tentative cultivar names - *'Kestor'",'Hyator", 'Foxtor'* and *'Cosdon'* all of which are Dartmoor tors within a stone's throw of my home.

Crossing the white form of *Phyllodoce glanduliflora* with *Kalmiopsis leachiana* produced two seedlings, one of which is yet to flower. The other flowered for the first time in spring 1988, with just a few spiky racemes of small, pink and white, bell-shaped corollas, each having five daintily reflexed pointed lobes. No buds are apparent for 1989 so that although, potentially, this is a delightful little shrub, it may prove too shy-flowering to be worthwhile.

The genera *Gaultheria* and *Pernettya* are very closely allied, some botanists believing that *Pernettya* should be sunk into *Gaultheria*. On that basis, hybrids of *Gaultheria* and *Pernettya* would no longer be regarded as bigenerics.

x Gaulnettya 'Wisley Pearl', the hybrid of *Gaultheria shallon* and *Pernettya mucronata*, has been in cultivation for many years as an easy-going garden plant which covers itself in summer with small white bells followed by rather sombre black-red fruits. A seedling of this fertile bigeneric is 'Pink Pixie' which is dwarfer, pink in bud opening to blush white and with more reddish-coloured fruits.

In New Zealand, where *Gaultheria* and *Pernettya* come together in the wild, natural hybrids occur and are not uncommon. Professor W. R. Phillipson in Rock Garden Plants of the Southern Alps *(3)*, provides a description of such a colony telling of natural hybrids between *Gaultheria depressa* and *Pernettya nana* in which the berry of the *Pernettya* is clasped by a large star, formed by the fleshy calyx of the *Gaultheria*. My attempts to repeat this cross in cultivation have been foiled by the refusal

of *Pernettya nana* to flower for me.

One plant in my collection was raised from seed of *Pernettya macrostigma* of wild origin. It is almost certainly a hybrid with *Gaultheria depressa* and is a plant which is attractive at all times. It has formed an intricate tangle of wiry branchlets, sparsely foliaged with chocolate-brown leaves broader than those of Pernettya macrostigma. The creamy-white bell flowers are pretty enough, though very tiny and not in sufficient mass to command attention from a distance. These are followed by sealing-wax red fruits in which the berry is gripped by the swollen calyx like a gem set in an ornamental clasp. These fruits remain on the shrub throughout winter and often well into spring.

The family Ericaceae has always held a special place in my affections. Exploring the relationship between its many genera not only throws up some interesting new garden plants but helps one to understand more fully the evolutionary pattern of the family.

(1)(2) For further descriptions of 'Arctic Tern' and 'Brilliant' see Cox, Peter A and Kenneth, N E, Encyclopedia of Rhododendron Hybrids, Batsford, 1988, pp29, 53.
(3) Philpson, W R & Hearn, D, Rock Garden Plants of the Southern Alps, Caxton Press, Christchurch, 1962, pp79-80.

Ottawa Rhododendron Album

By Gerald Taaffe, photos by Ruth Taaffe

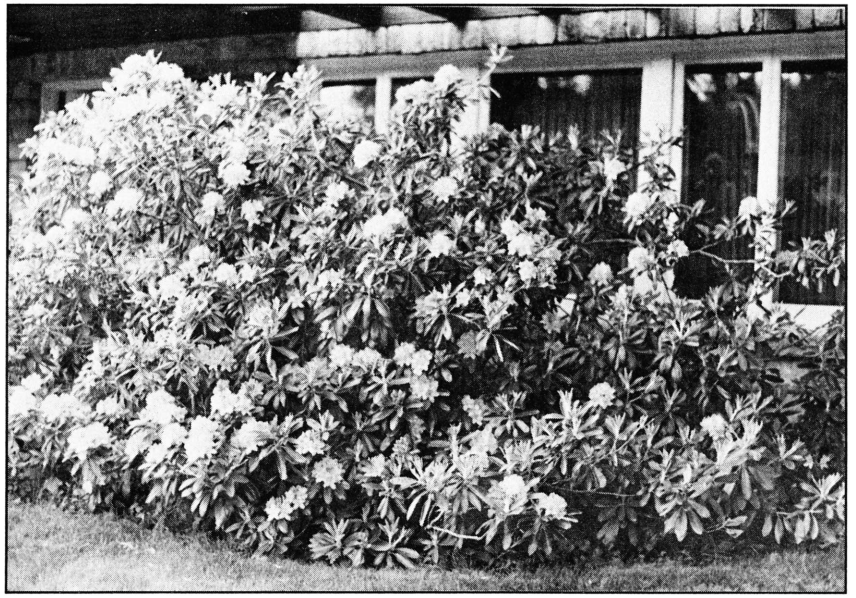
We spotted it before the taxi pulled off onto Island Park Crescent - a rhododendron far larger than anything my wife and I had imagined possible in our bitterly cold Ottawa climate. It was resplendent in full bloom, a nice purplish pink, not unlike a good form of "Roseum Elegans," and as we drove up to the house we expected to find the flowers wilting in the 31C. here, like all of the *catawbiense* forms and hybrids we had seen that day, including our own.

But they weren't, despite virtually full exposure to the late afternoon sun. And the plant wasn't one of the ironclads. The best discovery was yet to come. We gave silent thanks to our friend and neighbour, Ken Beatty, who had spotted this rhododendron earlier on in the spring and sounded out the friendly owner, Mrs. Gordon Armstrong, who said she would be delighted to have us come around to take some pictures.

The plans my wife and I had made to take photographs of some happy, healthy rhododendrons in the Ottawa area were complicated by unusually rotten weather in 1988-89. Searing heat and drought from May 1988 through summer had been capped by what turned out to be the biggest snowfall of the season, in mid-October, breaking weather records and beating many rhododendrons to the ground. Prolonged Indian Summer ensued, leaving the plants especially vulnerable to the first bitter cold, a sudden drop to -22C. in mid-December, which was followed by a winter notable for its lack of snow cover. It was cold and dry in March and April and then hot and damp in May. The normal stately progression of bloom from *mucronulatum* onwards was compressed into an unseemly rush.

In our garden, for example, the lingering pinks of 'Windbeam' and 'Malta' were shouted down by the glaring orange of a nearby 'Gibraltar.' There's normally a comfortable gap between their blooming times. What was intended to be a leisurely tour of many gardens had to be compressed into a few hectic days.

So it was with the heady feeling that our luck was changing for the better that we got out of the cab to take a close look at what must be the biggest rhododendron in this part of the world. While Ruth rang the bell, my pulse jumped at the sight of heavy indumentum, tan under mature leaves and thick and fuzzy white on new growth. They were like the leaves on our young *smirnowiis* at home (not yet at blooming size) except for rather more rounded leaf tips, and this, I see in David Leach's Rhododendrons of the World, is typical of the species. The bloom matched Leach's description of *smirnowii* as well, lightly ruffled, with deeply cut lobes and, as I said, unfazed by the afternoon sun.



Mrs. Gordon Armstrong's R. smirnowii is 7 feet tall and 18 feet wide

R. 'Yaku Princess' in the Dominion Arboretum is doing well, despite Ottawa's USDA Zone 5A location

R. narcissiflora in the Clark garden

R. yakushimanum 'Ken Janeck' in Glenn Clark's garden

By the time I had taken this in, we had been joined by the congenial Mrs. Armstrong, who had bought the house long after the rhododendron had been planted and knew nothing about its origin or kind. She did say, however, that as long time residents of the neighbourhood, she and her husband had seen the plant long before purchasing the property. They believe it was planted in the late 1940's, probably 1946 or 1947.

Mrs. Armstrong watched while we brought out the measuring tape and found that her plant was an amazing 18 1/2 feet wide and 7 feet high. How very unusual this is can be gathered from the fact that the largest *smirnowii* that David Leach had encountered when he wrote his classic work was a relatively diminutive 14 feet wide and 6 feet high. Earlier on we had the good luck to find a magnificent specimen of 'Yaku Princess' whose flower buds were just beginning to open at the nearby Dominion Arboretum. The winter had taken a heavy toll on the rhododendrons there, but this plant was almost unblemished. It came to the Arboretum's nursery in 1979 directly from its breeder, Tony Shamarello, and been put in the bed in 1987. Now it was 31 inches high and a good 6 feet wide, the only one of a number of Mr. Shamarello's 'Royalty' series in the planting to escape serious winter damage this year.

Another cab ride took us a few miles south along Bank Street to Glenn Clark's garden, the most enchanting we have seen yet in the Ottawa area. There is a planting of hardy cactus in front, part of a neat urban landscape; there are magnolias everywhere, *Halesia carolina*; a garage is covered with *Clematis macropetala*. His American Yellow wood *Cladastris lutea* bloomed for the first time this year, as did his diminutive *Laburnum*. If you want first-hand advice on whether *Stewartia* or *Styrax* will survive in the Ottawa area, Glenn is the person to ask. (They won't; he's tried them.)

As we moved around to the back of the property, Glenn explained that he started the garden in 1975, appalled at first by the soil - pure sand, apparently fifty feet deep. But then words became superfluous. We were in a different world altogether. There seemed to be no limit to the expanse of dappled shade illuminated by graduated masses of colour, mostly pastels of pinks, peach and light yellows, but with glowing patches of bright white, reds and orange. It was hard to believe that this seemingly endless area was less than an acre, 100 feet across and not much more than 400 feet deep.

Here was the best display of rhododendrons and azaleas we had seen in our bitter climate. The first individual plant singled out was a 28"x49" 'Ken Janeck' variety of *yakusimanum*, probably a hybrid and pinkest of all Yaks before fading to white. Nearby was the second largest rhododendron we spotted in Ottawa, a *brachycarpum ssp. tigerstedtii* 4 1/2 feet high and fully 10 feet across. It wasn't yet in bloom,

but according to Glenn this hardly mattered, since the clusters would be small, an uninteresting off-white and largely concealed by new leaf growth.

In contrast was a fine 'Edmond Amateis,' with nice purplish spotting in its big white flowers. Almost as fine were specimens of the yellow-blotched whites, 'Lodestar' and 'Ice Cube,' and a 'Boule de Neige' exactly twice as wide as high (5 feet x 2 1/2 feet). The cherry red of 'Nova Zembla' seemed just right in this context, and the dark green of a five foot wide carpet of 'Wilsoni' was the stuff of an idealized forest floor.

What gave the garden its unique flavour, however, was the innocent exuberance of the deciduous azaleas - the pinks of 'Rosy Lights' and 'Corneille,' the pure white of 'Oxydol' and nuanced whites of 'Sylphides' and 'Persil,' the complex peach or apricot of 'Mount St. Helen's' and 'Buzzard,' the soft yellow of 'Narcissiflora' and the bright tones of 'Girard's Crimson.' This is to name but a few, some of them 7 feet high and 5 1/2 feet wide. It was like a child's storybook illustration of a lollipop forest.

Because of the truncated blooming season, we had to take most of the pictures in our own central Ottawa garden. Even here, though, many nice plants eluded the camera's eye. The alpine rhododendrons, my favorites, proved difficult to capture in black and white film. They came through the heat and scant snow cover with surprising grace for the most part, but the contrast between flower and small, shiny leaf doesn't show up very well in monochrome; and they are planted in a tangle of mostly ericaceous plants, which compounds the problem. The problem was different with the two *keiskei*, the type species and the very low growing 'Yaku Fairy' form. They bloomed exuberantly, but the mass of bright flowers was in such stark contrast to the dark greens of surrounding plants that there is little definition.

Other plants bloomed too late for inclusion: the reliable 'Chionoides,' whose long-lasting white clusters seem impervious to the June sun, and, above all, the remarkable alpine, *nakaharae* 'Mount Seven Stars,' covered with its amazingly large red bloom for most of July. Both *forrestii* and *forrestii repens* also sailed through their first Ottawa winter in fine fettle.

Two growing seasons is hardly a conclusive test for these last three, but they've already done a great deal better than expected. The weather they shrugged off devastated some herbacious plants - sweet woodruff *Galium odoratum* and *Corydalis lutea* among them - that had been rampant and seemingly indestructible for a number of years.

Introducing the Savill and Valley Gardens

J.D. Bond, Keeper of the Gardens, The Great Park, Windsor

Reprinted with the permission of the Dunedin Rhododendron Group, New Zealand (Bulletin #14, 1986)

The gardens are set in Windsor Great Park within the county of Surrey, the Berkshire-Surrey boundary being just a few yards away from the western edge of the Savill Garden. The Great Park, which extends to some 4,500 acres, is part of the Windsor Estate administered by the Crown Estate Commissioners.

The climate of the area is reasonable; winters, in the main, are not excessively mild. The severe winters of 1962-3 and 1981-2 were exceptional. The rainfall is low, just twenty-two inches a year, and this creates a problem because of the very sandy, fast-draining soil known geographically as Bagshot Sand. The valleys and areas adjoining water courses are peaty and hold moisture throughout the year. All areas are acid, the wet ones excessively so. A mile or so north of the garden the soil changes dramatically to a heavy London clay, and Windsor Castle is built on an outcrop of chalk. In spite of the poor nature of the soil, it has proved to be ideal for the great beeches, oaks and sweet chestnuts and, of course, for the extensive range of ericaceious subjects which are so much to the fore in the Savill Garden.

Before relating the history of the Savill Garden, it is necessary to look at the period 1740-1820. It was during the reigns of King George II and King George III that William, Duke of Cumberland, the third son of King George II and after him Henry, Duke of Cumberland, brother of King George, both Rangers of the Great Park, transformed the wastes of Surrey bog and heathland into the superbly landscaped parkland we see now. The many ponds and lakes are artificial, time having produced the natural appearances of today, and they are all part of an intricate and, even now, most efficient drainage system. All of the great forest trees, the native beeches, oaks and exotics, such as the sweet chestnuts from Southern Europe, and a few rather more rare specimens, some of which still remain, were also planted during this period. The great elms, sadly all now having died from Dutch Elm Disease in recent years, were planted in the main at earlier dates. It is difficult today to accept that these great plantings are not natural, although over the years many natural seedlings have appeared, in particular the lovely, but weedy, birches. A lesson for all of us here, that is, to plant trees for the future.

This was the scene which confronted a new arrival to the estate in 1932 - Eric Savill - who took up the duties of Deputy Surveyor and was in a few years to become Deputy Ranger, a post he held until 1959. He

was made a K.C.V.O. in 1955 by Queen Elizabeth II, a reward for his fine achievements in the Great Park which included his horticultural activities. A previous honour, by command of King George IV in 1951, that the Bog Garden should be named the Savill Garden also gave him the greatest pleasure. Sir Eric held the post of Director of Gardens from 1959 until 1970, when he finally retired. He died on April 15, 1980, just two years before the Golden Jubilee of the garden was celebrated. The garden remains his monument.

Eric Savill's great horticultural strength was in his landscaping ability, and the many vistas, glades and open meadows which he created are of even greater importance today, now that many of the trees and shrubs have reached large proportions. Water also was very much to the fore in his design, and he made good use of the stream by making the Upper pond and extending the lower Pond, and improving the stream by widening it and adding weirs.

His great love of good plants ensured that the garden contained an outstanding range of woodland subjects which provide superb spring and autumn displays. The need for summer colour soon became obvious; the result, large herbaceous borders and rose gardens were promptly designed and planted.

The first area to be developed, in the north-eastern corner now known as the Willow Garden, was followed gradually by others. There was an inevitable 'hold-up' during the 1939-45 war, and the whole 35 acres were completed by 1950.

At this point, one must mention the parts played by King George V and Queen Mary. The Royal couple made a visit in the very early days and are reported to have remarked: "It is very small, Mr. Savill, but very nice." Sir Eric often related this incident and always considered that this was his 'green light.' King George IV and Queen Elizabeth gave tremendous support. Both were great gardeners who were themselves making a delightful woodland garden at nearby Royal Lodge, which allowed a happy association of ideas and sharing of plants.

As for the garden in recent years, changes have to be made and have been made, but the same goal, to produce the best and finest woodland garden, is the paramount aim of the current management.

Reference was made earlier to the completion of the garden. Although this statement is clear as it stands, it is also somewhat misleading, for a garden is never complete. Anyone who retires with smug satisfaction, having 'completed' a garden, will find his or her creation rapidly careering downhill. Some trees and shrubs deteriorate quickly, mistakes will be made by all gardeners, and replacing and thinning will be necessary. In some cases, new subjects will become available which are superior and more worthwhile. Ground cover shrubs, evergreen azaleas, for example, will grow rapidly together and need replanting, and

many herbaceous and bulbous items will require periodical lifting and dividing, clumps having become too large and the soil exhausted. In short, no gardener should ever become complacent and over-satisfied; there is always room for improvement.

The Valley Gardens are divided into three main areas: the Valley Garden, the Heather Garden and the Rhododendron Species Collection.

To begin the story, the reader is asked to return in retrospect to the end of the 1939-45 war. Virginia Water, a lake which was constructed in the 1750's by William, Duke of Cumberland, had recently been refilled (it had been drained at the outbreak of war in order to remove an obvious landmark). At the time the attractive series of valleys, which are situated on the north bank of the lake, were covered with impenetrable thickets of *Rhododendron ponticum* and countless birch and sycamore seedlings. Rising out of this undergrowth and towering above the valleys were numerous specimen beech, oak, sweet chestnut and Scots pine, the majority of these having been planted between 1750 and 1790.

The whole area, although most attractive in its wild and natural state, presented the landscape gardener with an area absolutely right for development as a woodland garden. It is not surprising, therefore, that in 1947 Sir Eric Savill, with the greatest encouragement from King George VI and many leading gardeners of the day, began to develop the area, having completed the Savill Garden. The undergrowth was grubbed and burnt; some of the larger trees, particularly those in ill health, were removed and others pruned. Rides and paths were made and areas prepared for planting.

Details of the history and the ensuing development of the Heather Garden site, once a gravel pit, are of some interest, and it is suggested that to begin the story the reader should attempt to picture the scene when the pit was in full production. The period, prior to the 1914-18 war. The means of transport - horse and cart. The tools - pick and shovel (no mechanical diggers then). The use of the gravel - to add metal to the rides in the Great Park.

Returning to more recent times; in 1954, when the decision was made to make a heather garden in the gravel pit, a very different scene confronted the Gardens Staff. The bell heather, ling, gorse, common birch and various moorland grasses had recolonized the area and completely covered the scars caused by the gravel working, and also provided excellent cover for numerous rabbits, hares and other wild life.

Much of the area has now been developed in an informal manner. The undulations of the floor of the pit (caused by the heaps of top soil left behind by the gravel diggers) have been followed rather than levelled, and the pit walls have been carefully left clothed with the indigenous vegetation. Areas chosen as planting sites were marked out

in irregular shapes and thoroughly trenched, considerable quantities of leaf mould being used, for the meagre amounts of poor top soil mixed with the pure sand would have provided little encouragement for the various new inhabitants to thrive and flourish.

The collection of rhododendron species was formed by the late John Barr Stevenson at Tower Court, Ascot during the period between 1900 and 1950. In 1951, following J.B. Stevenson's death, the collection was acquired by the Crown Estate Commissioners and subsequently transferred by the Windsor Estate staff to its present site in the great park, this mammoth task taking four years in all to complete. The many fine rhododendrons which had been introduced prior to 1900 formed the basis of the collection. However, the first half of this century produced a great wealth of new species, which were being discovered and sent home by the noted collectors, Farrer, Forrest, Kingdon-Ward, Ludlow and Sherriff, Rock and Wilson from the temperate regions of south-east Asia. This new material provided the major part of what is today considered to be the largest and finest collection of rhododendron species grown together in one garden.

Again, these gardens are a further memorial to Sir Eric Savill whose great foresight and landscaping ability made them possible.

And for the future, as in the Savill Garden, changes will be made to ensure that these vast gardens are kept up to date and in good order. The National Collections, namely the magnolias, rhododendron species, holly, dwarf conifer, pieris and mahonia, are of tremendous importance and it is possible that more of the great wealth of the plants grown here will be further designated as National Collections in the future.

Comments on indumented Rhododendrons. III
Rhododendron makinoi and *R. roxieanum*

by M. J. Harvey, Halifax, Nova Scotia

These two species are unrelated but I want to deal with them together because their characteristic foliage of long narrow leaves gives them a certain visual distinction. Actually *R. roxieanum* comes in both narrow and broad-leaved varieties as I shall explain shortly. The narrow leaves separate them from just about all other Rhododendrons and enable them to be spotted instantly in gardens.

R. makinoi

The name was coined by Tagg in 1927 to honour the Japanese botanist Makino who studied this and many other plants of the Japanese Islands. However, before and since that date this plant has had a long history of having its name changed. Taxonomists have played a game of musical chairs with these various names placing them first in the species position, then as subspecies, then as varieties of other species. I will refrain from going into details. The reason for all the prevarication was that scientists and gardeners alike (but mainly scientists) were unwilling to accept that the long, narrow leaves were a constant and distinguishing feature. They insisted that it must be an aberrant, narrow-leaved form of some other species, if only they could decide what that species might be.

Now historically, the above attitude can certainly be justified by reference to hundreds if not thousands of curious leaf forms which have been discovered in the wild and brought into cultivation. *Rhododendron* has relatively few examples, for instance *R. linearifolium*, but other genera such as *Acer* have been particularly prolific in producing leaf varieties. Humans seem to have it in their nature to treasure the freaks and neglect the common in their selection of garden plants. Hence an abnormally narrow-leaved plant can usually be assumed to be an abnormal form of a more normal-looking species. However, *R. makinoi* appears to be an exception to this rule.

Additional reasons why *R. makinoi* has never been happily subsumed in some other species is because it has a list of other non-trivial characteristics which mark it off from anything else. In other words, it is not just the leaves which are its distinguishing feature. There are, for instance, the persistent rings of bud scales (perulae) and a growth habit of not putting out its annual shoots until later in the summer. Oddly enough, I might note that the bud scales persist longer on my *R. yakushimanum* 'Yaku Angel' than on my *makinoi*.

I should mention that Frank Doleshy has struggled for many years with the problems of classification of the Japanese Pontica Subsection (to which *R. makinoi*, *degronianum* and *yakushimanum* belong). To a large extent, he has led the fight for the recognition of the distinctiveness of *R. makinoi*. I can only applaud his persistence. His main technical publication on the subject was published in Chamberlain, D.F. and F.L. Doleshy, 1987. 'Japanese members of Rhododendron subsection Pontica: distribution and classification'. J. Jap. Bot. 62:225-243; with a discussion by F.L. Doleshy 1988: 'How the Japanese Pontica Rhododendrons fit together', J. Am. Rhododendron Soc. 42:190-194, 234.

I follow him in considering that *R. makinoi* is a distinct and isolated species which has no intergradations to the other members of Subsection Pontica in Japan. Putting this into evolutionary terms, it presumably diverged a long time ago, well before the *degronianum-yakushimanum* complex which has given Doleshy so many headaches.

In nature *R. makinoi* is found in woodlands and more open areas at quite modest altitudes (180-700m according to Cox) in a fairly circumscribed region of Central Honshu (the central, main island of Japan). The reason for this limited distribution is not known, there may be historic as well as climatic reasons. Doleshy reports that it is frequent on the north-facing slopes of mountains. In terms of hardiness, it is flowerbud hardy to North American Zone 6. That is to say it is just a little more tender than *R. yakushimanum* which is a much higher altitude plant although further south.

In terms of variability there is not a great deal reported. A well-grown plant will have leaves almost 20cm long by 1.5cm wide. Less well-situated plants develop shorter leaves and this appears to be a response to growing conditions and not a genetic difference. However, there is some genetic variation in flower colour; my favourite is a good mid-pink but there exist paler pink and blush-white genotypes. The flowers are in a medium full truss opening in mid-season.

Although heavily brown-indumented on the lower leaf surface, the margins of the leaf are recurved and render the indumentum on the mature leaf of no ornamental significance. However, the young shoots in late summer are white-felted and add a surprising contrast at that time of the year. The white hairs on the upper surface are washed off by the rain as the leaves expand so the whole plant resumes a uniform green colour. The leaves persist 4-5 years, thus giving a good, dense plant when well-grown.

The adaptive significance of the leaf shape and growth cycle can only be speculated about. In most species of plants, narrow leaves and indumentum are the classic adaptations to dry habitats or, in evergreens,

to a drought stress at some time of the year (possibly winter). My knowledge of the climate of Honshu is limited to the graphs presented by Walter and Lieth in their Climate Diagrams (Klimadiagramm-Weltatlas, 1960+). Let us take Diagram 191 representing Asia as an example. This site is in the foothills of the central mountains at an altitude of 674m. This is the upper limit of growth of *R. makinoi*. The diagram tells us that the rainfall is 1959mm per year (over six feet). This is not exactly a drought-prone habitat. At lower altitudes the rainfall is a little less but never reaches a deficit. The maximum temperature occurs in June and July and the maximum precipitation in July and August when shoot growth occurs. At all times the precipitation greatly exceeds the potential evaporation so this is not a stressed locality from the evaporation point of view. Mean annual temperature is 9.8C, mean daily minimum of the coldest month is -4.3C and the lowest temperature recorded is -12.7C. I can thus see absolutely nothing in the climatic data that would appear to dictate a requirement for narrow leaves or a late leaf flush. Lower sites in Honshu have the same general climatic characteristics but are slightly less wet and milder.

It would seem that the greatest water stress on the leaves is in the winter, but the woodland habitat would in itself give considerable protection. One would predict a plant with that type of leaf to have a habitat of scree slopes and dry cliffs but such is not the case. Maybe keeping a good-sized bunch of leaves for 4-5 years results in a multiplication of the stress from the sheer number of leaves.

One curiosity of *R. makinoi* is that it is frequently subject to chlorosis. Cox mentions this in his Smaller Species of Rhododendrons. My own experience comes from a seedling bed which was formerly a vegetable garden on a clay soil. It had been limed with dolomitic limestone some ten years ago but since then I have dug in peat, oak and maple leaves so it is now acidic. It supports excellent growth of many Rhododendron species and hybrids. Under these conditions only two groups of plants show yellow leaves: the hybrid 'Canary' (*campylocarpum x caucasium*), and seedlings of *makinoi* and its hybrids. Locally 'Canary' does badly and I am not at all fond of it; in fact, I am pleased to report that my plant recently died. The *makinoi* seedlings stand out with bright yellow leaves among normal green seedlings of other species. This trait is also inherited through the pollen since *degronianum x makinoi* and *metternichii x makinoi* are also yellow. (*R. metternichii* is now a sub-species of degronianum.)

However some *yakushimanum x makinoi* in a different soil in seedling flats are normal green and as the seedlings in the seedling bed get older and develop better root systems they also turn green. The effect is therefore, a metabolic one and since there is plenty of magnesium in the soil, it is possible that some chemical system downstream from the synthesis of chlorophyll is responsible, most likely iron absorption.

Actually, looking at my chlorotic seedlings I sometimes regret that they are not genetically fixed. A Rhododendron with bright yellow foliage would be a welcome addition to our shrub borders. It would look good next to the blue-green leaves of *R. camanulatom var aeruginosum*.

In terms of general garden use R. makinoi is only for connoisseurs. It makes growth fairly slowly but will eventually make a good symmetrical bush in the open. One old plant I saw at Leonardslee was about 2m and slightly wider. The flowers are good for a species but not up to the standard of even old hybrids. Whether you want one or not depends on the value you put on odd foliage. As with most species, few nurseries stock it. Pronunciation: mak-in-O-ee, the two final vowels should be pronounced as separate syllables not as a diphthong.

R. roxieanum

Here we have a member of the Subsection Taliensia, a group which has traditionally been treated with suspicion because they have a reputation for being slow-growing, difficult to root and having small, unexciting flowers. Hybridisers in general have had no use for them since the usual aim is to produce rapidly growing plants with large, brightly coloured flowers. This is just what the Taliensia are not famous for. Many of the species grow slowly and take twenty years to produce their first flowers, although I must say *R. roxieanum* is not so bad in this respect. Certainly it is nothing like its close relative *R. proteoides* which is just about the most difficult in the Subsection.

As regards the leaves there is a range of widths from those at the narrow end of the spectrum, conventionally labelled *var. oreonastes* (a name apparently without much official standing) to the broader forms of *var. roxieanum*. The narrow and broad-leaved forms are reported as growing adjacent to each other, thus they cannot be made into geographical subspecies. There is also a *var cucullata* with broad leaves which D.F. Chamberlain thinks is most likely a hybrid of *R. roxieanum x proteoides*. The best display of the forms I have seen is in Windsor Great Park where some six genotypes are being grown together. In any case, the leaves are much shorter than in *R. makinoi* usually ranging from 5-10cm long.

In nature, the species is widely distributed at high altitudes (3,000-4,250m) in the region where Tibet, Yunnan and Sichuan meet. It can grow in exposed places such as cliffs where no doubt the ability of its

thick indumentum on the lower leaf surface to reduce water loss is of great survival value.

As regards its suitability for general garden use, the narrow-leaved form is becoming more widely grown because it makes a well-shaped rather narrowly pyramidal shrub. The leaves stick out rather stiffly and in this respect it has a better balance of leaves to branches than the rather mop-headed *R. makinoi.*

The other attractive miniature feature of *R.roxieanum* is its flower trusses which are small and rounded and produced quite generously when it is mature. I have seen the term 'golf-ball heads' applied to them.

Pronunciation: rox-ee-AH-num

Future developments: I now have a few seedlings of the hybrid *roxieanum x makinoi.* It is too early to assess their potential but they certainly have narrow leaves. If they have the expected hybrid vigour they should be easier to grow than either parent.

Note from the editor:

Our new printing process allows the use of both black and white and colour prints. Exceptional colour prints can now be reproduced in colour (although at considerable cost).

Your bulletin is in need of fresh articles concerning members' experiences with their rhododendrons. Please share your knowledge and joy about rhododendrons with your fellow members through your bulletin.

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E. FRANK PALMER AWARD Best Canadian Produced Hardy Rhododendron	Seedling Lyall Crober Queenston, Ontario
W.E.P. DUNCAN MEMORIAL AWARD Best Deciduous Hybrid Azalea in Commerce	"Klondyke' Howard Ruppender Westlake, Ohio
M. LESLIE HANCOCK AWARD Best Lepidote Rhododendron	'Ilam Violet' Al Smith Niagara Falls, Ontario
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ROBIN DUNCAN MEMORIAL AWARD Best Deciduous Azalea Species	R. japonica Richard Birkett Oakville, Ontario
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