GREAT LAKES CHAPTER

North American Rock Garden Society (NARGS)

FALL NEWSLETTER, AUGUST 2009

CALENDAR OF CHAPTER MEETINGS **meeting details below**

****SATURDAY, September 12: FALL PLANT SALE & GARDEN TOUR**

MEETING:	**11:30 AM – ca. 3:30 PM**
PLACE:	**Bev & Robert Walters'** – see map insert
BUSINESS MEETING:	**11:30 AM**
BAG LUNCH:	**12:00 NOON (while touring garden)**
PLANT SALE:	**1:30 PM**

Please note that this is a football Saturday! Game time is 3:30 PM; so on the way home, roads will be clear. But starting late morning, traffic coming into Ann Arbor will begin to build. If possible for you, avoid US 23 south, and, of course, the State Street area when coming to Bev's.

****SATURDAY, October 17: FALL MEETING**

MEETING:	**10:30 AM – ca. 2:30 PM**
PLACE:	**Hamburg Senior Community Center** – see map insert
PROGRAM:	**10:30 AM – brief business meeting**
	11:00 AM Pam Eveleigh
	The Genus Primula
	12:30 PM – catered lunch
	1:30 PM Pam Eveleigh
	Alpine Flowers of Southeastern Tibet

MARK YOUR CALENDARS:

We will send out our usual timely winter postcard with details

****SATURDAY, January 16, 2010: Annual Winter Potluck**

We will be featuring a program by Nick Turland on ***Plant Hunting in the Mountains of Greece***

****SATURDAY, February 20, 2010:** at **Arrowhead Alpines** we will have a hands-on meeting about ***Plant Propagation*: *Seeds*, *Cuttings*, *& Grafting***

UPCOMING NATIONAL MEETINGS **See the Rock Garden Quarterly for details.**

- **The 2010 Annual Meeting will be hosted by the Rocky Mountain Chapter in Denver, and promises to be an exciting meeting. It will be July 11-14, 2010 at Denver & Salida, Colorado. See the notice in the body of the Newsletter.**

Western Winter Study Weekend: *Alpine Trails*: *From the Switchbacks to the Suburbs*
March 5-7, 2010 — Medford, Oregon. Hosted by the Siskiyou Chapter of NARGS.

Eastern Winter Study Weekend: *Rock Gardens of the Future. Great Plants + Fabulous Design*
March 19-21, 2010 in Devens, Massachusetts. Hosted by the New England Chapter of NARGS.

From the Chair

What kind of summer have you had? It took a while for the warmer weather to show up. Which saved me $$ not having to run the air conditioner. But I would like to have had more rain. So I spent my saved $$ on water for the garden. Yes, I know some of you have had your gardens turned into swamps. All in all I shouldn't complain.

I must take some space here to thank Jacques Thompson, Andrea Urda-Thompson, Tony, and Susan Reznicek for the great work they did to make our Spring Gala such a success. They were the ones who envisioned, scheduled, and flat-out made everything come together. Also thank you to those of you who graciously opened your gardens for our guests. We had people show up from many other Chapters including the current NARGS President Grazyna from Ohio. I have received many comments about the good time they had at the Gala. Again, thanks guys.

Our Fall Plant Sale is coming up. I'm asking (pleading) for you to pot up lots of plants for the sale. I have committed some of our funds on very good speakers for this fall, and next spring, and need to have a great sale to help pay for them. Our Oct meeting has Pam Eveleigh doing two talks. We will also be providing lunch for everyone between Pam's talks. Check out Pam's website www.primulaworld.com. For our January potluck we have Nick Turland, a botanist from the Missouri Botanical Garden. I got to hear Nick talk last spring at the Eastern Winter Study Weekend. He was very good. We also have a meeting set next February at Arrowhead Alpines that will be a hands-on meeting on Propagation, including Seeds, Cuttings, and Grafting. So you see to cover this we need a great turnout at Bev Walters' for the Fall Plant Sale.

Please remember to collect seed through out the year from your garden or other travels for the NARGS Seed Exchange. Also we are in need of places to hold our plant sales next year. So please pass on any ideas for locations or of gardens you would like to visit.

John Serowicz

March 28, 2009 Meeting – *Spring Alpines of the Pyrenees*

by Laura Serowicz

The March 28, 2009 meeting featured a talk by Todd Boland on "Spring Alpines of the Pyrenees". Jacques Thompson first gave a brief history of how he got into rock gardening, which started when he was a volunteer at Matthaei Botanical Gardens after he met Tony Reznicek. Jacques really became intrigued after Tony took him to visit Dick Punnett's garden, and he, and Andrea have since attended many NARGS meetings, and met many interesting people including our speaker for the day. Todd Boland, a Research Horticulturalist for the Memorial University of Newfoundland in St. John's, is an avid gardener. He has written several articles for the *Rock Garden Quarterly*, and is one of the main writers on the Dave's Garden website. He has an interest in orchids, and hybridizing Rhododendrons, as well as enjoying bird watching as an obsessive hobby.

Todd first gave a brief overview of the Memorial University of Newfoundland (MUN) Botanical Garden in St. John's, since technically his speaking tour was for his work at MUN. Newfoundland is the easternmost province in Canada, and St. John's, at the eastern end of the island, is at about the same latitude as Minneapolis so they are not really that far north, and their hardiness zone is listed as 5b. St. John's is stuck out into the Atlantic Ocean, surrounded by water, and has a very damp climate (60" of rain a year) with mild temperatures. MUN Botanical Garden which opened in 1977 has 110 acres, but only 10 acres are cultivated, the rest is a nature reserve. It is in a boreal forest so the trees surrounding the garden are primarily spruce, fir, eastern larch, and a scattering of white birch. There is a lake on the property, and several bogs, wetlands, fens, and true sphagnum bogs with pitcher plants. It is also an important research facility, which is where Todd does his work. They have a lot of educational programs, and have various gardens of every type that a gardener might be interested in. Their latest garden is a crevice garden that they put in place last summer with the help of a NARGS grant. Another garden is the Heritage garden which contains a collection of old varieties from Newfoundland gardens that date back to at least the First World War. Included in this garden is Fair Maids of France, *Ranunculus aconitifolius* 'Flore Pleno', which is rarely available in cultivation as it is sterile, and dies back in summer, and most surprising was *Alstroemeria aurea*, which dated back 120 years ago in Newfoundland. What they are more famous for is their Rock Gardens which were built in two phases, the old rock garden was built in 1972 in the traditional style with all the rocks placed by hand, and the new rock garden in 1989 was made from very large limestone which had to be moved by machinery. An alpine house was also built in 1989, and then the crevice garden was added last year. A small stream runs through the new rock garden, and flows into a bog. There is also a perennial border, a shade garden, and an ericaceous garden among the various gardens at MUN Botanical Garden.

Todd's talk on the Spring Alpines of the Pyrenees was actually from a bird watching trip he took in early May last year with a tour group which does birding tours in April/May, and then in June/July they do orchid, and alpine plant tours. As luck would have it last year was the wettest winter on record for Spain, normally by May everything in the lowlands is dried up but last year everything was still green, and lush. In the mountains the plants were at least three weeks earlier than normal so Todd saw all but three of the orchids that are normally seen on the June orchid tour. The Pyrenees are all limestone so all the plants he showed should be adapted to the soils in our area.

The first plant Todd saw was *Allium moly* growing in the gravel on the side of the road in the lowland pre-Pyrenees area near the Vadiello Dam at 1000 m/3281'. The two plants Todd really wanted to see on his trip were *Ramonda myconi*, and *Saxifraga longifolia*, which he found growing side-by-side in the vertical cracks on a cliff face. Most of the *Ramonda* had finished blooming but the *Saxifraga* were in full bloom with their long white panicles cascading off the cliffs. Some other cliff dwellers found in this area include: *Sedum album*, *Valeriana apula*, which is endemic, and very fragrant, *Asarina procumbens*, and *Sarcocapnos enneaphylla*, which is also endemic, and related to *Corydalis*. Growing in the gravel on the side of the road were *Saponaria ocymoides*, and *Adonis annua*, which is a red-flowered annual (but also can be yellow

or orange). He also spotted a couple of rockroses, yellow-flowered *Helianthemum canum*, which is more choice than the more common *H. nummularium*, and white-flowered *H. apenninum*. Another interesting plant found around the dam area was blue-flowered *Lithodora prostrata*, which is totally prostrate, and like a half-sized *L. diffusa*.

Todd then moved on to the valley in between the pre-Pyrenees, and the true Pyrenees at 1200 m/ 3937', where there were 3 or 4 species of *Narcissus*, mostly the jonquil-type, but they were already past blooming. There were some other bulbous type plants in bloom: *Asphodelus ramosus*, *Muscari neglectum*, *Fritillaria nigra subsp. pyrenaica*, *Asphodelus albus*, with glaucous leaves, and *Dipcadi serotina*. Todd also showed lots of woodlanders including: *Hepatica nobilis*, with white, pink or blue flowers, *Isopyrum thalictroides*, *Anemone ranunculoides*, *Chelidonium majus*, which is a vicious weed in Todd's garden, *Allium ursinum*, with 2 very broad leaves, *and Viola pyrenaica*, which is endemic. Three woodland *Saxifraga* are found in this area: *S. cuneifolia*, *S. geranioides*, and *S. granulata* (of which, the first, and last Todd has grown in his garden). There were lots of species of creeping Thyme (incl. *Thymus serphyllum*) growing any place the ground was dried up, and the scent would waft up as he walked along. *Paronychia argentea* is an unusual plant which looks like creeping thyme in foliage, but it has white, papery bracts which surround minute little green flowers. Some of the other plants seen in this area include: *Ranunculus gramineus*, *Valeriana montana*, *Arnica montana*, *Linum narbonense*, *Anthyllis montana*, *Antirrhinum majus*, *Onobrychis arenaria*, and *Eryngium bourgatii*. Among the first orchids Todd saw on this trip was *Orchis morio*, which is the least showy at only 6 inches high. *Ophrys sphegodes* is one of the so-called bee orchids, this species is known as the spider orchid. Todd saw lots of *Dactylorhiza fuchsii* there, as well as some *Orchis militaris*, *Orphrys scolopax*, which imitates a wasp, and *Anacamptis pyramidalis*, which is related to *Dactylorhiza*.

Todd's next stop was at the base of the Pyrenees in Hecto Valley at 1300 m /4265'. Several small ferns were growing in the rock walls surrounding the monastery in the town they stayed in, including *Asplenium trichomanes*, *Ceterach officinarum*, and *Cystopteris fragilis*, which is also native all over North America, wherever there is limestone. *Leucojum aestivum*, and *Muscari comosum*, with its purple tassel of flowers at the tip, were among the bulbs found in this area. *Pinguicula grandiflora*, with its large flowers, and *Parnassia palustris* were growing in a wet area. *Petrocoptis pyrenaica* is a pink- or white-flowered endemic, and *Cardamine raphanifolia* is a beautiful, highly fragrant, pink flower that was growing with its roots in a stream. The yellow-flowered *Gentiana lutea* is a tall plant (1-2 m/3-6') which takes a long time to bloom, its large *Veratrum*-like leaves were popping up here, and there in the grassy meadows. Todd also spotted a couple of broomrapes, *Orobanche amethystea*, and *O. alba*, which are parasitic plants that host on European beech, and possibly a pine species. Among the orchids found in this area were: *Dactylorhiza praetermissa*, *Epipactis atrorubens*, *Epipactis helleborine*, which is a weed even in St. John's, a couple of bee orchids, *Ophrys apifera*, and *O. fusca*, *O. fusca* being the least showy but still interesting, *Cephalanthera longifolia*, which can get up to 1 m/3' height, *C. rubra*, *Orchis coriophora*, *and* the tongue-orchid, *Serapias lingua*. Some of the orchids grow in wet meadows, some in gravelly roadsides, and some grow in areas that definitely get bone-dry in summer, especially the higher alpine orchids.

Further up the Hecto Valley at 1500 m/4921' was the land of the hellebores, everything from there on up we can grow here with no problem. *Helleborus foetidus* was well into seedpod at the time Todd visited, but green-flowered *H. viridus* was just coming into bloom. *Vitaliana primuliflora*, was growing in dense shade on top of a rotten stump in a beech forest – not at all where Todd expected to see it since he grows it in full sun. Also found were *Paris quadrifolia*, a European relative of *Trillium*, and *Primula veris*, and *P. elatior* which were all over the place in this area. *Arctostaphylos uva-ursi* also occurs throughout the Arctic region. The forest was a mix of beech, and Norway spruce, and a few other conifers, and among the woodlanders were *Pulmonaria officinalis*, and *Cardamine heptaphylla*. *Scilla liliohyacinthus* is like a *S. verna* but on steroids, quite large leaves, and flower stems 8-9" high, growing in quite dense shade. *Carduus carlinoides* is a wicked biennial thistle with a large rosette of spiny white wooly leaves 1 ½' across. All the *Linaria alpina* Todd saw were a beautiful rich purple-blue (not the washed out colors found in many of our gardens). *L. pyrenaica* [*L. supina*] with yellow flowers is also in this area. White-flowered *Pinguicula alpina* was found growing in a seepage, they also saw *P. vulgaris* as well. Some orchids found growing close to an alpine zone included: *Aceras anthropophorum* which is called the Man Orchid, and comes in two color forms, most commonly a pale form, but sometimes a darker maroon form, found growing on a rocky road cut, *Orchis purpurea*, called the Lady Orchid, is a stunning tall plant with petals that are almost black, *O. provincialis*, *Pseudorchis albida* which grows in Newfoundland but nowhere else in North America, *Coeloglossum viride*, the Frog Orchid, which is now reclassified as a *Dactylorhiza* although Todd does not think it looks at all like others in that genus.

Todd's next stop was enroute to the France border, close to, and above the tree line at about 1800 m/5906' in the cloud layer. *Androsace villosa*, and *A. carnea* were the only two *Androsace* species he saw in this area (others are native to the Pyrenees). *Arabis alpina*, *Cerastium ceratoides*, an alpine chickweed with glossy leaves, *Primula farinosa*, *Hutchinsia alpina*, *Iberis spathulata*, and *Anemone narcissiflora* were among the plants found here. Also in this area are: *Vicia pyrenaica*, a small prostrate vetch with one large rich purple flower about the size of a quarter, *Trifolium thalii*, *Lotus alpinus*, *Geum reptans*, with runners like strawberry plants, *G. montanum*, and *Ranunculus parnassifolius*, which Todd grows in their alpine house. Green-flowered *Daphne laureola* was the only daphne Todd saw there, it is marginally hardy here. *Thymelaea tinctoria* is the namesake for the daphne family, it smells like a daphne, and the individual yellow flowers look like daphnes, but when not in bloom it looks like a *Hebe*. It isn't in cultivation, but it should be hardy enough. There were spectacular *Gentiana verna*, and *G. angustifolia*, the latter grows much better than the former for Todd. *Veronica ponae* is quite a pretty blue Veronica, it was growing with *Saxifraga granulata*. Truly alpine orchids which grow above the tree line: *Dactylorhiza sambucina*, which comes in purple, and yellow forms but does not appear to hybridize, also *Dactylorhiza incarnata*, pale yellow-flowered *Orchis pallens*, purple-flowered *O. mascula* scattered all over a hillside

meadow with most plants only 6-8" tall, but one was 1 ½' tall, and *Plantanthera bifolia*.

At one of the higher peaks in the Pyrenees at the border with France at 2400 m/7874' there were still patches of snow so not much in growth yet, but this is the area where the tour group comes for their alpine tour in late June. They saw one little dwarf willow, an endemic, *Salix pyrenaica*. Among the plants that were in growth up there were: *Pulsatilla vernalis*, *Saxifraga oppositifolia*, *Silene acaulis*, a yellow *Draba* sp., *Helleborus lividus*, and *Hepatica nobilis*, growing well above the tree line out in full sun, most of them were white, whereas in woodland areas they are mostly blue. Also here are *Saxifraga paniculata*, and *Viola riviniana*, which was growing in a little crack. There were scatterings of *Narcissus pseudonarcissus*, with large flowers, and also *N. minor*. Another Primula they saw there was *Primula integrifolia* with tiny rosettes and one or two large blooms, and were quite hairy. *Soldanella alpina* were growing out in the full sun rather than in the woods. Lots of *Achemilla alpina*, and *Primula elatior* grew there as well as the choice *Ranunculus amplexicaulis*. *Scilla verna*, and *Erythronium dens-canis* were two other bulbs still in bloom there too. So overall Todd saw quite a few alpines even though he was not there at the peak alpine season in June.

May 16, 2009 Meeting – *The World of Saxifrages* by Laura Serowicz

The May 16, 2009 Spring Gala dinner meeting featured a wonderful talk by Malcolm McGregor on *The World of Saxifrages*. Malcolm was the editor for many years of the Scottish Rock Garden Club journal *Rock Garden*, and the Saxifrage Society's *Saxifrage Magazine*. He is the author of the new comprehensive book on saxifrages [*Saxifrages*: *A Definitive Guide to the 2000 Species Hybrids & Cultivars* from Timber Press], it is the first publication since 1919 to cover all the species, and hybrids. Malcolm has traveled around the world searching for saxifrages in their natural habitats, researching, and studying herbarium specimens as well as growing them in his own garden. Malcolm's talk was divided into three sections: An Introduction to the Saxifrage Family, then a Tour Around the World looking at various saxifrage hot spots, and finally a Look at Gardening with Saxifrages.

There are three characteristics of saxifrages that make them both interesting as a genus but also interesting for the gardener: they are a very varied group of plants – many of them very beautiful, they are widely distributed (which means not only will we find them in lots of places but also there are a lot of spots in the garden for them), and they are very easy to grow. The flowers are more varied, and dramatic than we sometimes realize, and some of the more recent hybrids from Japan have extraordinary flower forms as well. The basic structure of a saxifrage flower usually has 2 stigmas (with the ovaries below them), and around that are 10 stamens, and then 5 petals, and 5 sepals.

The saxifrage family, the Saxifragaceae, is a much more varied family than you would think, it includes 33 genera in 3 broad branches which can be further divided into 8 groups. Even though the plants may look quite different from each other if you look closely at the flower structure of all these plants you will see they are the same. The first branch is divided into 3 groups which include *Astilbe*, *Boykinia*, and *Telesonix*, *Leptarrhena*, *and Tanakea*. The second branch is divided into 3 groups based on *Darmera*, *Chrysosplenium*, and *Heuchera*. Within the *Darmera* group are several good garden plants including *Rodgersia*, which are the largest in size of the whole family, *Bergenia*, *Mukdenia*, *Astilboides*, and *Oresitrophe*. The *Chrysosplenium* group consists of *Chrysosplenium*, and *Peltoboykinia*, and they are the least typical of all the groups. The *Heuchera* group is a big group, and almost totally American with *Heuchera*, *Tiarella*, *Lithophragma*, *Tellima*, *Mitella*, *Tolmiea*, as well as several lesser known genera. The third branch, and final group is the *Saxifraga* group itself, or was until 2008 when, based on recent genetic work, botanists decided to split *Saxifraga* into two groups, *Saxifraga*, and *Micranthes*. *Micranthes* are actually much closer to *Heuchera* than they are to normal *Saxifraga*, so they are actually considered a new group in the *Heuchera* branch of the Saxifragaceae. Malcolm's talk (and his book) concentrated mainly on *Saxifraga*, and *Micranthes*, *Saxifraga* is further divided into 12 sections, and *Micranthes* into 5 sections.

The distribution of saxifrages is mainly north of the Tropic of Cancer but there are also a few found in Ethiopia, and South America. Plants were pushed southward by the ice ages, and then they followed the ice back northwards as the glaciers retreated after the ice age, and plants also move up mountains after the ice ages, and each time they move they evolve slightly, and get differentiated, and that is why there are all the different species. Saxifrages migrated from the Himalayas through Japan, and up through the Bering Straits to North America. This is where saxifrages are most recent, and here they diversified enormously into all the other genera like *Heuchera*, *Tellima*, *and Tiarella*. And one species gets all the way down into South America.

The European mountains, like all the areas Malcolm discussed, have saxifrage groups which are special to them. There are four groups in Europe: of the Silver Saxifrages [section *Ligulatae*] only one is found outside Europe, London Pride Saxifrages [section *Gymnopera*] are all European, a tiny number of Mossy Saxifrages [section *Saxifraga*] get outside Europe, and the Dwarf Cushion Saxifrages [section *Porphyrion*] are split between Europe, and the Himalayas.

Silver Saxifrages can be impressive plants. *Saxifraga longifolia* found in the Pyrenees, can have a rosette that gets over 1foot across. It differs from other Silver Saxifrages in that it grows for years as a single rosette until it flowers, and then it dies, it sets a lot of seed so you can grow it on again. *S. callosa* is a more typical Silver Saxifrage with beautiful long sprays of flowers but it has very variable foliage with some having long narrow leaves forming tufts that resembles the sea anemones found in tidal pools. Like all Silver Saxifrages it has lime encrusting the leaves, it also has side rosettes so when the main rosette flowers and dies the side rosettes continue growing, making it a better plant for your garden. Growing in probably the hottest conditions are *S. hostii* and *S. cochlearis* which grows on bare limestone in the south of France at relatively low altitudes. *S. hostii* is not a very big plant but if it is in the right place it can seed itself until it covers an area, such as in the photo Malcolm showed of it growing on the side of a bridge.

The London Pride group of saxifrages such as *Saxifraga cuneifolia*, *S. spathularis*, and *S. hirsuta*, are familiar, tough

plants that can cope with very adverse conditions, they can survive unattended for years. It has lots of little pink, bright pink, or white flowers. They grow in deep shade, and will cope with either wet conditions or long periods of dry weather. The actual hybrid known as 'London Pride' is the oldest artificial hybrid saxifrage in the world (from S. *spathularis*, and *S. umbrosa*), and dates back to the 1680s.

Probably the biggest section in ordinary gardening in Europe is the Mossy Saxifrages, they are very common at all the garden centers. Most of the garden hybrids are crosses with *Saxifraga exarata subsp. moschata* [formerly *S. moschata*] from the Alps which has small creamy yellow flowers. The first Mossy hybrid in cultivation was *S.* 'Elegantissima' with dark red-purple flowers which goes back to 1870s, and is still grown today. Since that time bigger, bolder hybrids have been created with some stunning colors from white to dark pink-red, and many variations in the size, and shape of the petals. Most of them form fairly nice little cushions, and some of them will cope with a bit of neglect.

The Mossy Saxifrage section also has many interesting species which have not been used in hybridizing. *S. carpetana*, forming little bulbs, and surviving the hot dry summers in Spain by dying down after flowering, and then coming up again with the autumn rains. It grows quite high in the mountains so it gets covered with snow at times, and can be grown here, although very few people grow it. *S. erioblasta* also grows in the Sierra Nevada Mountains of Spain, forming big cushions with flowers that turn from white to pink once they are pollinated. White-flowered *S. genesiana* self-seeds in Malcolm's greenhouse. *S. reuteriana* with the edges of its white petals folded under and looking like frilly petticoats grows in southern Spain. There are a lot of saxifrages out there still that we haven't seen in cultivation, such as *S. arachnoidea* which is a mass of hairy sticky stems that make it impossible to separate into individual plants. It grows in limestone debris under overhangs of cliffs, in hot spots that are completely protected from rain.

The group epitomizing in many ways what saxifrages are for the ultimate specialists is the Dwarf Cushion Saxifrages. The European species are generally white- or yellow-flowered. The dwarf cushions hybridize easily with one another so if they grow near each other, and flower at the same time there may be hybrids in the wild. It is extremely easy using species to hybridize them yourself. White-flowered *S. burseriana* which grows in the Alps, and yellow-flowered *S. aretioides* from the Pyrenees were used for the first dwarf cushion hybrids done in the 1890s to 1900s. If you want to start with one of this type, *S.* ×*apiculata* 'Gregor Mendel' is one to try as it is very robust, weather-resistant, and forms a vigorous cushion in the open garden.

The Himalayas also have Dwarf Cushion Saxifrages, and other groups as well. To the plant, because the atmosphere is very thin you get very bright ultra-violet light, so they get much more intense light (different from the Arctic where they get 24 hours of sunshine in the summer). Thus 12 hours of Himalayan sunshine is worth a lot more than our 12 hours of sunshine (if we get 12 hours here), and they tend to get this sunshine once it passes the monsoon season. Up in the high passes the plants are uncovered from the snow for about 3 months, so they have to do all their growing in 3 months. The Dwarf Cushion Saxifrages from the Himalayas are different in a number of respects: the center of the flower is cup-shaped, if they have white petals, they tend to have brown anthers (whereas the European white-flowered have yellow ones), and the petals seem to be sparkly, and thick textured, with larger surface cells which refract light. There have been a lot of these species introduced, and all have been used in the production of hybrids that have now become quite common in the garden. White-flowered *Saxifraga poluniniana* has been used in a lot of crosses, but Harvey Wrightman said that crosses involving that species are not the toughest here. Not all the species are white-flowered, *S. lowndesii* has deep pink flowers, and the recently introduced *S. pulchra* has light pink flowers with long stamens, and red anthers on an exquisite small plant. Malcolm showed two of his own hybrids based on crosses from this group, *S.* 'Dora Ross', and *S.* 'Cio-Cio-San'. He says they are not difficult to cross – you strip all the petals off one flower, then take the individual stamens from the other flower, and using a magnifying glass to ensure you applied them correctly, pollinate the 1st flower and cover it so that no insects get at it.

Most of the Himalayan saxifrages are from the yellow summer flowering group [section *Ciliatae*], which is a big, and interesting group. There are 250 species in this section, and of those, 240 come from the Himalayas, and China. *Saxifraga jacquemontiana* grows in tiny cushions high up in the mountains. *S. nigroglandulifera* growing in the Everest region of Nepal, has nodding yellow flowers, and resembles a *Bergenia* with its larger leaves. With drooping flowers plants in monsoon areas keep their pollen dry. *S. bergenioides* is similar but with purple flowers that are unusual in this section. Yellow-flowered *S. sediformis*, *and S. candelabrum*, with dramatic yellow, and red flowers, were shown in pots, so a few are being grown by specialists. This group is not easy to grow, and they really are pot plants because they struggle outside in the garden, although Malcolm doesn't think that the hot, humid summer conditions kill them.

If you go a bit further north in Asia towards Japan, there are late season saxifrages [section *Irregulares*] which generally flower in the second half of the year. The flowers are rather beautiful with incredible elongated petals, as seen in *Saxifraga fortunei*, and *S. rufescens*. There are a couple of dozen species, and a lot of new hybrids as well. Many of them are plants you would find on the woodland fringe with large leaves to gather a lot of light, these kind of leaves would get shredded if they were growing on the mountainside. Among the new species that are appearing are *S. mengtzeana*, photographed on the cliff of a gorge in Tibet that has stolons hanging down with plantlets at their tips. *S. epiphylla* was in cultivation [by Heronswood], and being sold before it was even formally named. It is distinctive in that plantlets are formed on the base of the leaf blade so it is incredibly easy to propagate.

The Bering Straits might not seem the most obvious place in the world for a variety of saxifrages, but it is like a bottleneck – the habitats squeeze together as you go through it and the conditions are extreme so you get diversification. There are three groups of saxifrages up there, Yellow Summer Saxifrages [section *Ciliatae*], Rough-leaved Saxifrages [section *Trachyphyllum*], and *Micranthes*. *Saxifraga hirculus* the archetypal Yellow Summer Saxifrage, is found in North America, and in Europe. Usually it is just a single stem but if the conditions are right, such as they are around the Bering Straits, you find mats of it. *S. eschscholtzii* is a species which only grows just on either side of the Bering Straits, it is a

small plant with tiny cluster of foliage that in severely cold weather closes in on itself, insulating the center of the plant. They have an intriguing little cluster of flowers, delightful when it flowers, but not a plant you would cultivate. *S. funstonii* [*S. bronchialis subsp. funstonii*] is a rough-leaved saxifrage growing in the tundra near Nome, Alaska on open limestone. It has nice flowers with yellow spots on pale yellow petals, whereas *S. tricuspidata*, and *S. vespertina* have red spots. When you look at *Micranthes* it makes sense that they were split off from *Saxifraga*, and put in the same branch as *Heuchera*, because they look more like that form. Typically they either have clusters of flowers on the stems like *M. hieracifolia* or a head of small flowers like *M. nelsoniana* which are both found in this area.

In North America the most prominent group in the saxifrage family is *Micranthes*, and they are the most common saxifrages in western North America [after that is *Saxifraga*, *Heuchera*, *Boykinia*, *Tellim*a, *Mitella*, and *Lithophragma*]. In North America it is this incredible diversification that is the most noticeable characteristic. In the Rocky Mountains is one of the Yellow Summer Saxifrages, *S. chrysantha*, which for various reasons seems to be difficult to grow although it has been grown by a few specialists in Europe. Possibly the species from the Rockies which is most desirable is *Micranthes rhomboidea*, known as the snowball saxifrage for the dense white ball of flowers held on solid 8-9" tall stems, making a good display on the rocky slopes above Denver. More like a congested *Heuchera* is the Yellowstone saxifrage, *M. subapetala* which has no petals, it is closely related to *M. oregana*. *Heuchera bracteata* a seriously heat adapted plant grows in hot dry places in the mountains of Colorado, Arizona, California, and New Mexico. *Telesonix jamesii* grows in the granite on Pike's Peak.

Micranthes nidifica from the Cascades is what Malcolm called the "bad side" of *Micranthes*, with its tiny inconspicuous flowers 8" above small shiny leaves. Another species from the Cascades, and the Coastal Ranges is *S. mertensiana* which has weird clusters of red bulbils on the stems. These bulbils are what you usually receive from the seed exchanges rather than true seed, just scatter them in a damp patch of woodland, and they will grow, and form colonies. They die down in the summer after flowering so they can potentially get through the summer period quite well. In the Cascade, and Olympic Mountains you find another variety of *M. nelsoniana* [*var. cascadensis*], away from the harsh climate of Alaska they have much softer leaves. *M. tolmiei* is a snowmelt plant which may explain why it is difficult to grow.

On the Pacific coast side of the Olympic Mountains it is a cold, damp rainforest. *Tiarella trifoliata* can be found growing on fallen tree trunks, and *Boykinia occidentalis* grows in the shade. By contrast, the eastern side of the Olympics is in so much of a rain shadow that all they have are lavender farms there. One of the *Saxifraga* found in the Olympics is *S. cespitosa* [which is on the cover of Malcolm's book], it is a very widespread species but the plants found here are the most beautiful that Malcolm has seen anywhere. Further up in the Arctic they become very dwarf plants. Another saxifrage found on the same mountain slope as *S. cespitosa* is a Rough-leaved one, *S. bronchialis subsp. austromontana*.

The final photo Malcolm showed for this section of his talk was of *Micranthes tischii* which is the most threatened saxifrage in the world, and was only just discovered in 1986. It grows on the bare rocky ledge of a steep slope at about 5000' above sea level where it had retreated up the mountains. It only grows on the highest most north-facing ledges of the Olympic Mountains, and in one place on Vancouver Island. It grows where there is permanently a slight dampness, but it has nowhere else to go if there is any rise in temperature, so is in real danger of extinction. Malcolm admitted that it is not an impressive plant as it is only 1 ½" tall, but it shows the size adaptation a plant can take since nothing else grows on these ledges where it has found its niche.

Malcolm's own garden at his home in the UK is quite small, and he shares the space with his wife Monica [who happens to be currently teaching in Vietnam, so is likely to discover Malcolm's portion of the garden has increased when she gets back home…]. When gardening with saxifrages there are various characteristics which make them useful. There is a wide range of plants available, probably 800 *Saxifraga* are available, and if you add in the whole family there are probably 1000 plants in the family that you can grow or at least try. Part of the fun is seeing what you can grow especially if you are not sure you will succeed with it. Basically saxifrages are pretty easy to grow, much easier than *Primulas* at least in general terms. They are very good for small gardens, and they have a long season, the first saxifrages in Malcolm's garden flower at the end of January, and the last ones flower when the first hard frost comes. It's not just flowers that make them attractive, foliage is part of it, even into autumn when frost highlights the structure of the plant.

The flowers of Dwarf Cushion Saxifrages are very weather resistant in most cases, and will cope with late snows. In general the bright yellow cushions cope better with full sun because the species in their background come from Turkey, and Greece. The pink-flowered cushions usually have Himalayan plants in their heritage, and tend to want moister or more shady positions. As you go from early- to mid-spring the Mossy Saxifrages come into flower, they vary quite a lot in color as well as size. And the effect can be very different depending on whether the flower stem is tall or right above the cushion. You really notice the differences when you grow them close to each other. Typically mid- to late-spring you get the London Pride Saxifrages, and they tend to grow better in a place where they get a bit of shade at least some of the time since they come from the deep shade of forests. At the end of the season the section *Irregulares* saxifrages flower from September until frost [or to December if no frost]. The Japanese love these native plants, and have many hybrids with elaborately dramatic flowers such as *S.* 'Cotton Crochet' with white doubled petals, and *S.* 'Cheap Confections' with pink flowers. In addition to the variety of flower colors available there is also variety, and variegation in the foliage colors. Even in winter saxifrages add to the garden if you leave the seedheads on to show their structure in the snow.

Malcolm grows his plants in rock gardens, troughs, containers, and large pots. *Bergenia ciliata* is a nice one because its leaves die down at the end of autumn, and when it blooms for him in February the leaves are just starting up again so the flowers are much bigger than the leaves, which is opposite of how most *Bergenia* look in flower. Mainly Saxifraga are grown in tufa or on horizontal rock gardens, and the precise balance between the mix you use, the aspect (north, south, east, or west), and the amount of water you give them is an amazingly local issue. The way he does it is not

how someone else would do it, even 30 miles away. You must evolve to do it, and you will lose a few along the way. His 20 year-old plant of *S.* 'Gregor Mendel' is in ordinary rock garden mixed with grit, as he got more specialized he added more sand, and grit to his base. *Micranthes integrifolia* has been in his rock garden for 4 years, and is now self-seeding, the plant dies down in summer to a resting bud, and the leaves come back up in autumn. *S. continentalis* is a white-flowered Mossy Saxifrage which few people grow, it is highly drought adapted, and in the summer the green rosettes close right up, and the backs of the leaves are scaly, and resist water loss, then in the spring it opens back up again.

Malcolm grows a lot of plants in troughs of various sizes, he likes as much stone in a trough as possible on the basis that it stops moisture loss. And whenever he can he uses the same kind of stones for the mulch as for the larger pieces in the troughs. Malcolm says if you get the rockwork looking good, it doesn't matter which plant dies. He uses sort of a crevice style for the stone work, and sets them in a long diagonal. Careful siting of troughs matters, and it is a lot easier to get it right the first time than to have to keep moving it. They are ideal for small gardens, and can divide a big garden up into a lot of little gardens.

Saxifrages are easy to grow, and long lived which is a useful characteristic since we are rock gardeners not gardeners that have to replace everything every year. We want to establish, and enjoy it. Saxifrages come from a wide range of habitats, from mountains, woodlands, meadow conditions, really hot places, and really cold places. A garden is like a model of that in miniature, with woodland fringe, and meadows, bits of mountain, and the wider the range of habitats plants come from the more likely you are to find ones that fit into your gardens. There are lots of Saxifrages available, and there are lots of them you can get from the seed exchanges. Saxifrage seed is tiny but it is not difficult to grow from seed, if you get fresh seed they germinate in 12 days, and flower in the second year.

We sometimes think we have got all the plants in cultivation that we will ever get, *S. dinnikii* was first described in 1890s from the Caucasus but it has only been in cultivation since 1990s from the Czech collectors. It has since been used in several new hybrids which have interesting characteristics that we haven't seen before. Unfortunately not all species which we bring into cultivation are we able to keep, *S. sherriffii* from Bhutan was in cultivation in the 1950s but has been lost since, and one collection of *S. meeboldii*, a tiny little species from northwest India, which was strongly scented, may be lost. *S. rotundipetala* from Tibet was just described in 1985 by a Chinese botanist, and is not yet in cultivation.

It is finding, photographing, and working out what it would take to grow some of these fascinating saxifrages that will continue to keep Malcolm intrigued with this plant family for years to come.

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