THE 958th MEETING OF THE BRODIE CLUB
MINUTES

The 958th meeting of the Brodie Club was held on May 15,2001 in the Ramsay Wright Zoological Laboratories of the University of Toronto.

Chairman: Jean Iron
Recording Secretary: Oliver Bertin
Attendance: 13 members and two guests

GUESTS:

Ron Pittaway, guest of lron
Rosemary Addison, guest of Ed Addison

ANNOUNCEMENTS:

The members decided to hold the annual field day at Joker's Hill, an extensive area west of Newmarket, on Dufferin St. just south of Hwy 9. The estate was donated to the University of Toronto and is currently being used for research by the Department of Botany. It is a natural area, suitable for walking, with forests and old fields and 45-meter white ash trees. Our host, Peter Kotanen of Erindale College, has provided a list of birds, reptiles and flora that we can expect to see. It will be handed out at the beginning of the trip to save on postage.
Members will meet at noon on Sunday, June 17. They are invited to bring a picnic lunch.
Joker's Hill is located in King Twp, roughly one hour north of Toronto. The property is on either side of Dufferin St., between Hwy 9 and SR 19 (Mulock Dr.). The simplest access is from Hwy 9. From Toronto, go north on Hwy 400 to the Hwy 9 exit (exit 55). Go east on Hwy 9 to Dufferin (the third road on the south), a small gravel road. Turn south and around the dogleg to get to the property. We will meet at one of the houses we are using for field work. The address is 16921 Dufferin St., posted on a green sign on the roadside, opposite the gates into the centre of the property. It is the first house on the east side, south of the Dufferin dogleg.

Minutes of the previous meeting were approved with minor changes.

SPEAKER:

The speaker was long standing member Harry Lumsden, who spoke on his recent trip to eastern Russia, Sakhalin Island and the Kamchatka Peninsula.

Russia 2000

My visit to the Russian Far East was to collect plants and seeds particularly of species not now cultivated in Western gardens.

The Pleistocene and Quaternary history of the North West Pacific has had a profound effect on the vegetation. There are many narrow endemics as well as species at the periphery of a vast range. While much of northern North America was completely covered by glacial ice, eastern Asia suffered from only local glaciation and important refugia preserved whole floras. The glacial maxima locked up so much water as ice that sea levels dropped as much as 100 meters during the

Wisconsin advance and 135 meters during the Illinoian period. This created a broad area of dry land between Alaska and Siberia known as Beringia.

Beringia provided an important passage way for northern plants and mammals between the continents. A refugium for fauna and flora existed in Kamchatka through the Kurile Island chain to Japan, from which plants radiated as far as the Aleutians (three to five species) and to the south as far as China and Taiwan.

Glaciation had an effect other than over-running plant communities. Ice caps, even when confined to mountain tops, were the centres of high atmospheric pressure as in the Magadan-northern Sea of Okhotsk area today. The cold, dry winds, circulating from these high-pressure areas, became drier and warmer as they descended to lower elevations and lost their capacity to carry moisture. In continental areas, they created semi-desert conditions. In North America and China, these resulted in dust storms which led to the formation of loess soils. Such an effect was probably negligible in the Russian Far East but the dry cold winds probably had some influence on the flora.

Sea temperatures must also have had a strong influence on the distribution and diversity of vegetation. The warm Japanese current (Kuro Siwa), equivalent to the Atlantic Gulf Stream, flows north along the east coasts of the Japanese islands ofKyushu, Shikoku and the southern and central part of Honshu. It then turns north-east, crossing the North Pacific and eventually circulating counter-clockwise round the Gulf of Alaska. It thus modifies the climate of southern Alaska and the Aleutians. This current splits south of Kyushu, flows across the southern tip of Korea, along the north shore of the Japanese islands and eventually passes between the southern tip of Sakhalin and Hokkaido.

Today, there is a cold ocean current, originating in the Arctic, that flows through the Bering Straits and south along the coast of Chukotia, Kamchatka and the Kurile Island chain as far south as Hokkaido and northern Honshu. At the height of the glacial epoch, this current would have been cut off by Beringia. We can surmise that the warm Japanese current flowed much further north than it does today, probably along the east coast of the Kuriles and eastern Kamchatka. With lower sea levels, up to 130 meters lower than today, many of the Kurile Islands would have been joined and the few sea gaps would probably have been so shallow as to prevent much circulation of warm water into the Sea of Okhotsk. Because of this history, we find a relatively rich flora extending through the Japanese Islands to Sakhalin, the Kurile Island chain, the eastern part of Kamchatka and the Aleutians into Alaska.

On the mainland of Asia, a rich flora exists in the Amur-Ussuri region which experiences a monsoon climate. Progressively to the north, many species drop out because of the severity of the climate and eventually the presence of permafrost. In the Magadan region, there are species which range from the Himalayas on successive mountain ranges, to low elevations close to the Sea of Okhotsk to Magadan.

(I flew from Toronto via Seattle and Anchorage to Magadan on July 12 and returned on August 16, 2000. The mountains near Anchorage, Alaska, were still covered with snow in mid-July and the fiords were still frozen. The Bering Straits were ice-free and the islands along the Chuckchee coast were incredibly barren. Snow drifts still filled the gullies.

Magadan was the administrative centre of the Gulag and controlled a large number of mines with male workers and lumbering camps with female workers. It has the only good harbour which will handle large ships on the Sea of Okhotsk. There is no railway to Magadan and only a very indifferent road to the west to Irkutsk. Otherwise, you can only fly or go by ship to Magadan.

The first field trip we did was to a mountain about 50 km north of Magadan. This is the type locality for Pulsatilla magadanensis. It seems to have no English name. Rhododendron kamtschaticum was abundant and coming into full flower. Loiseleuria procumbeus, an ericaceous species, alpine and subarctic in distribution, does not seem to be listed in any seedlist and is apparently new to horticulture. Primula cunifolia is found in the north-east Asian mountains of Japan, the Aleutians and Alaska. Phylladocce caerulea is circumpolar and not easy to grow in gardens. Sieversia pusilla is found in eastern Siberia and is often put in the genus Geum. It may not be in cultivation. Seed was offered by Dr. Berkutenko, my host and director of botany at the Institute of the Studies of the North. Salix saxitilis was growing in rocky stream beds on July 15, still with catkins opening. Patrinia rupestris is found on Asiatic dry stoney slopes. Epilobium latifolium is an Arctic form of fireweed and is circumpolar. Silene stenophylla is in East Siberia but not in general cultivation yet. Pedicularis amoena is not in cultivation. Legummonis saxifraga nudiculus was on very dry stoney sites, pink in bud. Pinus pimula was not more than two meters high and an indicator of permafrost, growing at the tree line, lovely in flower, with large seeds on which Nutcrackers feed. Cridium ajanensis is not in cultivation.

I have become very interested in the genus Corydalis, which has recently been monographed by Liden and Zetterlund (1997). It has been placed in the family Papaveraceae. At present, Corydalis of the subfamily Corydaleae contains 465 species but new taxa are being discovered and described all the time. About a quarter of the genus grows from tubers but others grow and spread from stolons, while still others from a mass of roots which can be propagated easily by division. The seeds do not survive drying and normally should be sowed as soon as collected. Damp storage is a possibility but needs controlled experiments. Some species have explosively dehiscent capsules and scatter their seeds several meters. At germination, only one cotyledon develops in some of the tuberous forms and development is slow, a single leaf appearing in the second year.

The flowers of Corydalis have a spur which contains a nectary. The colour of the flowers is very variable. They are found around the Northern Hemisphere. One native to Ontario is Fumaria afficianalis. Lumsden collected seed of this species at Snug Harbour, north of Parry Sound in very poor, gravelly soil beside a bush road. C. solida is common in gardens and is European in origin. C. limstowiana is a biennial from the Sichuan highlands. C. buschii is found in Vladivostok and vicinity. C. speciosa is a biannual from Japan. C. nudicaulis is from the Tadjikistan and the Palmir mountains at high altitudes. C. flexuosa is now common in gardens and is from Sichuan.

One of the purposes of the trip to Magadan was to determine the status of Corydalis magadanica. Liden and Zetterlund (1997), in their monograph on Corydalis, state that "it is apparently a very rare plant in the wild, being found in only a few suitable places near Magadan." They add that "the distribution of the species may therefore be wider than we know today" because of poor access and the isolated location of the area. This region is not a vast spaghnum moorland, as stated by Liden and Zetterlund. It is a stoney, rolling area with many mountainous screes. It does, however, have low amounts of soluble nutrients with very acid soils. We collected 15 soil samples from the various sites we visited and found the pH values ranging from 6.48 to 4.36, well below the neutral value of 7, and none above. C. magadanica occurs only along the coast of the Sea of Okhotsk. Most of the shoreline consists of a narrow beach of cobbles or sand, backed by the cliffs, eroding scree slopes or eroding sandy slopes, all steep and difficult to negotiate. C. magadanica grows in a narrow band, 3 to 20 meters above sea level. It has been recorded 80 km south to 8 km north of Ma gad an.

There is one specimen sheet in the herbarium at Magadan which gives a locality in the Ola River, 5 km east of Magadan. The location given does not record how far up the river the collection was made. This may be the only specimen taken away from the coast. It may have been from a similar steep, eroded river bank. There were three kinds of site in which we found it growing. On sandy, eroded slopes, it grows with the Far Eastern forms of Raspberry (Rubus sakhalineum), Spiraea (S. betulifolia), Fireweed (E. latifolium), Tansey (Tanacetum boreale), Geranium (G. eranthum), and the grass Calamagrostris langsdorfii. C. magadanica is one of the first plants to start growth in the spring. It blooms before its competitors have started to grow and the flowers form a conspicuous white band along the steep cliffs and banks of the coast. By July, the grass (Calamagrostris) is so tall and provides such a tangle that it is very difficult to find the dying remnants of Corydalis. A second site on which we found it was an open scree slope in association with Campion (Lychnis ajanensis), Anemone (Pulsatilla multifida), Baby's Breath (Gypsophila violacea), Wormwood (Artemesia lagopus) and Patrinia sibirica. All are low-growing "rock garden" plants. The third site in which C. magadanica grows is in crevices in cliffs and outcrops. There it shares the cracks with a beautiful pink flowered Stonecrop (Sedum cyaneum) and a Saxifrage (S. derbeckii).

Seed dispersal by this and many other species of Corydalis is interesting. The seeds of nearly all species have fleshy appendages known as elasiosomes, which are rich in fat. These are highly favoured by ants which carry them away when shed to eat the elasiosome. We found ants abundant in all sites where the Corydalis grows and expect that the crevice sites are colonized with the aid of ants. Flowers of C. magadanica start yellowish-white but turn white as they mature. Insects chew into the spur if they do not have long enough tongues to reach the nectary. In July, it was difficult to find the plants which were dying down. The tubers were located remarkably deep and a long stem twisted through the stones and earth to reach the light. The tubers varied in size probably because of age. Mean mass was 1.8 gm but those grown in my garden in richer soil without competition had a mean of 14.9 gm (n=9) after two growing seasons.

Corydalis gorodkovii grows in the Russian Far East in the upper Kolyma River drainage in the Cherskogo mountains. The southemmost site is about 100 km north of Magadan in the Kolymiskey mountains. It grows at high altitudes in the subalpine zone. We found it at 1000 m growing on the ala Plateau on an extremely barren, gently rolling scree area surrounded by steep slopes. The scree is composed of a consolidated volcanic tuff which had been broken into small pieces about 4 to 6 cm in diameter by the extreme cold in winter (-50C). This tuff is quite old. It consolidated perhaps 4,000 years ago and originated from eruptions among the volcanoes on Kamchatka across the Sea of Okhotsk. Among the broken stones and generally level with their surface, we found single or double very glaucous leaves. We found only one plant in flower but we found some seed pods and I bought back about 100 seeds. We had to dig carefully to reach the tubers. Removing stone by stone, taking care not to dislodge them into the crater, we reached the tubers about 18 cm below the surface. There we found a layer of humus in which the tubers were lodged.

The pH of two samples of the soil was 6.40 and 6.48. Liden and Zetterlund (1997) reported that this Corydalis can grow up to a height of 20 cm but we found none growing more than 12 cm above the scree surface, perhaps because of the exposed nature of the site. The tubers are much smaller than those of C. magadanica with a mass averaging 0.6 gm each. Their mean measurements were 1.5 mm x 0.9 mm. The seeds are rather large, black and shiny and less than 2 mm long. The plants are not self fertile and must receive pollen carried by insects from another specimen. Seed dispersal is achieved as with other species by ants which we found running around

in the scree. We found 43 species associated with C. gorodkovii. These are a few examples: Dicentra peregrina, Dianthus repens, Cassiope ericoidis, Rhododendron aureum and Vaccinium vitis-idea.

Sakhalin:

Sakhalin lies just east of the north coast of Hokkaido and runs parallel to the Primori coast. It belonged to Russia until the Russo-Japanese war of 1904 when Japan occupied the island and treated it as a possession under a Viceroy. The Viceroy's palace in Yezno-sakalinsk, the capital of the island, was very much in the Japanese architectural style with a "trophy" gun from Port Arthur.

The flora of Sakhalin is distinctive. The southern part of the island has a "monsoon" climate with much rain and constant humidity. Under this regime, a giant flora has developed. Petasites amplus lines the road sides like giant umbrellas. Veronica longipetala grows over 2 m high. Heracleum linatum reaches 3 to 4 meters in height. Eupatorium lindeleanum is a familiar genus to us. We saw a colourful caterpillar, species unknown. Linaria maritima, however, creeps on the shore. Daphne yezoensis has yellow flowers but is rare in gardens. Hemerocallis middendorfii var. esculante is good to eat. Lilium sakhalinensis Syn. philadelphicum was very large indeed.

Slides ofMulgedeum sibericum; Lilium pseudotignium was very like the European species. Cicuta virosa (Poison Hemlock) was common and very poisonous. Socrates died from drinking it. Lilium debilor takes two to three years to establish in a garden.

Kamchatka:

On Aug. 4, we flew to Petropavlovsk and were taken by the forestry staff to Elzevo, a small town west of the city at the foot of the Avatcha Volcano complex. Our host was Vladimir Andreevich, who was assistant chief of forestry in the southern district of Kamchatka.

The Nalichevslyi Nature Park, a World Nature and Cultural Heritage site has been established on the south-east part of the Avatcha volcano. This is one of the most active volcanoes in Kamchatka. It erupted in 1827, 1909, 1926, 1954, in 1945, a big one, and in 1991. Avatcha is 2,751 m high, but not the highest of all the volcanoes of this complex. Koyakaski is 3,456 m high but has not been active for a long time. The crater of A vatcha is filled with lava and there are small lava flows on the south slope and larger ones on the south-west and north. Snowfall is high in the mountains and may be up to 3 m on A vatcha with high water content. Sudden storms may produce up to 1 m of snow in 24 hours. Volcanic eruptions lead to fast-thawing of snow and hot streams of dust and stones (Lachars) cover large areas, killing everything in their path. In August, when most of the snow has disappeared, the stream beds are dry enough to be used for travel. We drove to the slopes of A vatcha on one such stream bed.

The Avatcha Volcano had many snow drifts in August and Mr. Putin came there to ski a week before we arrived. The flora was marvelous. Oxytropis kamtschatica, a legume, has a long tap root and is almost impossible to transplant. Gentiana algida: The better known gentians are blue but this is one of the exceptions. Catilleja hyperborea is parasitic on the roots of other plants and very difficult to grow. Penstemon fruitescens is the only species of this genus to be found in Eastern Asia. Saxifraga kruhscana has a wide attitudinal range in eastern Asia from sea level to over 2000 m at A vatcha. Astrocodon kruhsceanus is related to the bell flowers.

Ground squirrels: 'Sik siks' were abundant above the shrub layer. Although snow sheep ranged these mountains some time ago there are none there now. Common crows (Corvus corone) and Ravens (Corvus corax) were conspicuous round the peaks.

A species very rare in horticulture is Daphne kamtschatica. There is some natural woodland which has never been logged or burnt about 100 km from Elyavo. We found many clumps of Daphne which have extremely long roots up to 2 m long with almost no root ball. Outside the woodland where fires had burnt the forest in the past, there were extensive stands of Lonicera edule and many family parties picking them. The fruit is delicious and unknown in the West. We found Trillium kamtschaticum which was not in flower or seed but we collected tuberous rhizomes which flowered this spring in my garden. Aconitum delphinifolium was a conspicuous and beautiful flower among the Lonicera. Vladimir's garden at his dacha was unbelievably productive with potatoes, huge strawberries, crab apples, currants, cabbage, beets and onions. He had a fruit tree, Hippophae chaminoides, which I had never heard of before with delicious yellow berries.

Stellars Sea Eagles:

Dick (surname unknown) is working on Stellars Sea Eagles. They return to their nesting grounds in Kamchatka very early in the spring when almost everything in Kamchatka is still frozen. They feed on seal afterbirth and dead pups. Where there is a winter fishery through the ice, the fishermen discard the species they do not want on the ice. When they move to a new hole, the eagles descend and eat the discarded fish. Eagles also parasitize salmon-netting operations, fishing like an osprey.

Losses of eaglets are caused by bears which climb to the nests. When they cannot reach the nest, they scavenge around the base of the tree or cliff beneath the nest. There is nearly always bear signs round nest sites.

Stellars Sea Eagles which winter on Hokkaido are not doing well. The Japanese have overfished the salmon runs and there are not enough fish for the eagles. They have moved inland to scavenge on the remains of Sika deer shot by Japanese hunters. The hunters take only the haunches and the best parts. The eagles eat what is left and are poisoned with lead.

Dick charters Russian naval vessels. All he has to do is pay for the fuel and they will take him anywhere he wants to go.

Magadan:

The almost abandoned village of Atargan, once the site of a fish-processing plant can be reached by water about 30 km east of Magadan. It now has only seven residents. They live largely off the land. Two residents had a seal which drowned in a salmon net. We got a lift by motorbike along the peninsula to the area in which we wished to collect. Below the scree slopes and cliffs, we found a well-trodden trail created by Brown bears. The species we wanted to collect was Caragana jubata, a legume which does not seem to be in cultivation. It is a central Asian species which may grow to 2 m at the centre of its range, but is barely 20 cm on the coast of the Sea of Okhotsk. It is an unusual Caragana in that nearly all the genus has yellow flowers, but it has very large pink flowers. Its thorns are unbelievably long and sharp as we found when we collected seed. We found a beautiful red form of Saxifraga punctata, and an unusual sedum-like plant, Orostychis spenosa. Solidago spiraeifolia was one of the colourful components of the slope. On a flat, we found Cornus suecica, very like our Cornus canadensis, but for its black anthers. C. canadensis also occurs in eastern Russia.

About 23 km west of Ma gad an, there is a salmon fishing camp which we visited on July 23. On an extensive sandy area covered with shrubs and open areas, there were Skylarks (Alauda arvensis), White Wagtails, and an unidentified finch which behaved as if it had a nest. The open areas had a very extensive stand of Iris setosa, normally blue. Among many thousands, we found one pale-pinkish white. There was a very large Buteo flying in the distance.

We went on to a very interesting and productive lake called Deaf Lake in translation. Here we found Carrion Crows (Corvus corone) and Common Gulls (Larus canus) nesting. There were six Arctic Loons on the lake, several broods of European Common Teal, four Greater Scaup, and one Great Knot, conspicuous with its white rump. The flora is rich and interesting. Abundant Utricularia, Ranunculus pallasi, and a narrow endemic of the coast of the Okhotsk Sea, Nupha pumila. This is a tiny white water lily with a flower that is only about 2 cm. in diameter. Blooming later, there was also a tiny yellow water lily only about one-third the size of our common one here, Nymphia tetragona.

Liden and Zetterlund: 1997. Corydalis: The Gardener's Guide and a monograph of the tuberous species. Alpine Garden Society publication. Dorchester, U.K.

Hauiten, Eric: 1937. Outline of the History of Arctic and Boreal Biota during the Quaternary Period. Stockholm: 168 pp.

Kanno and Oka: In press.

QUESTIONS:

- The living conditions are getting better in eastern Siberia, a welcome change from the difficult times Russians were experiencing during Lumsden's previous trip to Siberia. People at the biological institute are now being paid, but there is a lot of poverty and hunger, and people are still scrounging for food in the forests. There are plenty of seals and salmon on the Kamchatka peninsula and people can buy the right to fish for them.
- Lumsden lived in empty apartments and oceanographic buildings as a guest of the Russian scientists.
- Some Russians spoke English, a language that is taught in the local schools. Others spoke on Russian, Inuit or the local native dialect. The official policy is to absorb the native people as fast as possible.

The speaker was thanked by Bruce Falls.

NOTES & OBSERVATIONS:

- Falls recently visited the Carden Plain, east of Lake Simcoe. He found a Loggerhead Shrike and an Upland Sandpiper, but failed to see the Yellow Rail that lives in the area.

- Hugh Currie saw a Mississippi Kite on Long Point, a rare visitor to Canada.

- The first warbler that Mary Boswell saw on her trip to Point Pelee was a Blue-winged Warbler.

- Pittaway saw a Scarlet Tanager, a Rose-breasted Grosbeak, an Indigo Bunting and a Chestnut-sided Warbler on a recent birding expedition.

- Ron Scovell saw a Parasitic Jaeger flying right down to the end of Point Pelee.

- Jennifer Young saw a Yellow-crowned Night Heron in Fort Myers on a recent visit to Florida, an exciting catch.

- Bertin saw a pair of Mute Swans nesting on Rattray Marsh, a heron patrolling the breakwall at the bottom of Bathurst St. and a huge number of Cormorants along Toronto's waterfront.

- Lumsden had two broods of geese hatch the day before the meeting. Cranberry Marsh near Oshawa has been drained, an attempt to rehabilitate the marsh which has suffered badly lately. It used to be a lovely marsh with many varieties of interesting wildlife and plants, but the barrier beach broke 10 years ago and carp got in, leading to botulism and many bird deaths.

- Boswell visited Prince Edward Point bird observatory and saw two Pileated Woodpeckers that were caught in mist nests.

- Iron saw a Chuck-will's- Widow at Pt. Pelee.

The meeting adjourned at 9:50 pm.

ANNUAL FIELD DAY:

The annual field day will be held at noon on June 17 at Joker's Hill, on Dufferin S1. just west of Newmarket and south of Hwy 9. Bring a picnic lunch and expect an easy walk.

Have a good summer and see you all in the fall!

-30-