VanDusen Bloedel
BOTANICAL GARDEN CONSERVATORY

Botanical Oddities and Surprises
Self-Guided Tour, Winter 2015/2016
Contributed by Sunday Guides

To be so tough, and take the light so well
Freely providing forbidden knowledge
Of so many things about heaven and earth
For which we should otherwise have no word
— *Trees*, by Howard Nemerov

The natural world, where physics, chemistry, geology and biology intersect, is complex and diverse. Many plants have odd and surprising features, evidence of the endless possibilities of life, including contorted forms, unusual adaptations and intricate relationships with other organisms. As you follow the numbered signs along this tour, look around you for more examples.

Enter the Plaza from the Visitor Centre and head toward the right corner of the plaza, where a **1 – purple osier or arctic willow (*Salix purpurea*)** is planted as an informal hedge along the ramp. Look closely at the swellings along the stems, a type of gall. Galls are abnormal growths caused by insects, mites, fungi, bacteria or viruses that live within the plant's tissues. The galls you see here are caused by a midge, a tiny fly that inserts its eggs into the stem's actively growing meristem. After hatching, the feeding larvae stimulate growth of the surrounding stem cells, forming a gall of raised tissue. Look for small holes in the galls where mature midges have emerged.

Turn left on the gravel path, then right onto the flagstone path into the Woodland Garden, toward two unusual tree trunks. The trunk of **2 – Sprenger's magnolia (*Magnolia sprengeri*)** seems to twist around itself and has slightly exfoliating bark. A few steps ahead on the left is a **3 – shore pine (*Pinus contorta*).** Its double trunk has grown together, apart, then together again. Look way up to see its needles.

Turn right at the gravel path. Past the bench on your left is a **4 – corkscrew willow (*Salix babylonica* var *pekinensis* 'Tortuosa')**, a small tree grown for its twisting branches. Continue right to the junction, bear left and then right at the lawn to a cultivar of **5 - black locust (*Robinia pseudoacacia* 'Tortuosa')**, also grown for its "tortured" form. Cultivar names like 'Contorta', 'Monstrosa', 'Tortuosa' and 'Cristata' highlight deviations from normal growth patterns.

Return to the path. Beside the entrance to the floating bridge, note the **6 - bald cypress trees (*Taxodium distichum*)**, bare of foliage in winter. Protruding from the ground at their base are their burnished, reddish-brown "knees". The function of these root projections has been debated for more than a century. A 2014 study found that more oxygen was present in submerged roots of *Taxodium* if their knees were above water, but other studies suggest these knees may play more of a structural role, buttressing the trees to prevent them from toppling over in wet soggy soils. There is no consensus yet as to whether these "knees" can accurately be called *pneumatophores*, defined as aerial portions of roots that allow respiration in trees whose roots are mostly submerged.

Cross the floating bridge and immediately cross the lawn to your left to the bark mulched path leading into the Mediterranean Garden. On the left side of the path note the knobs and bumps protruding from the trunk of the **7 - cedar of Lebanon (*Cedrus libani*)**. Some may be due to bark growing around old branch unions. Others might be developing burls, abnormal growths caused by irregular growth of dormant buds. The unusual grain pattern in burls is prized for woodworking and drives a black market in burls, many of which are cut illegally from redwoods, black walnuts, big leaf maples and others.

Continue up the stone steps and left on the gravel path. At the paved path to your right is **8 – butcher's broom (*Ruscus aculeatus*)**, whose flattened spine-tipped modified stems are called cladodes (sometimes phylloclades) and look like leaves. Flowers borne in the centre of the cladodes look oddly like flowers in the middle of a leaf. A member of the asparagus family (Asparagaceae), it is a monocot, not a eudicot. Monocots are herbaceous (e.g. lilies, tulips, grasses) with one seed leaf (cotyledon), compared to two in eudicots, and parallel leaf veins. Traditionally, the stiff stems of *Ruscus* were gathered in bunches and used to clean butchers' blocks.

Head left on the path through the Southern Hemisphere Garden and continue around the curve to the right. Just before the bridge is a **9 – alpine bottlebrush (*Callistemon sieberi*)**, native to Australia. The small bumps clustered along the ends of the shoots are capsules containing hundreds of tiny seeds. These can persist on

the plant for years or be released by the heat of a wildfire.

Cross the bridge and head uphill, then right through the Grotto into the Heather Garden. On your right is **10 - hedgehog broom (*Erinacea anthyllis*)**, a blue flowered legume planted in alpine gardens. Naturally occurring in the limestone mountains of the Pyrennees and Morocco, its cushion of spines provides excellent protection from herbivores.

Enjoy the varied textures of the dwarf conifers as you head toward the Scottish Shelter and the stone bridge to the **11 – Harry Lauder's walking stick or contorted hazelnut (*Corylus avellana* 'Contorta')** on your left. This mutation or sport was first found in a hedgerow in Gloucestershire about 150 years ago and has been propagated since by cuttings, layering or grafting. Look at the base of these two plants for straight shoots that are growing from below the graft on normal hazelnut rootstock.

Turn right on the paved path and continue to the towering **12 - snakebranch spruce (*Picea abies* 'Virgata')**. Norway spruce forms many variants in the wild, including dwarf varieties that arise from witches' brooms. There are more than 120 named cultivars of the species. The snakebranch form was named in France in 1853 and cultivated, mostly as a grafted clone, ever since. Variants occasionally appear in the wild and more than one clone has been distributed under the name 'Virgata'.

Just ahead to the right of the path is a bed beside the lawn with a group of compact dwarf conifers **13 – dwarf mountain pine (*Pinus mugo* var. *pumilio*),** clones of a witches broom, a natural mutation, found at VanDusen.

At the lawn to the left of the paved path is the Ash Collection. Cross the lawn to three ashes **14 – golden European ash (*Fraxinus excelsior* 'Jaspidea')**, planted in 1972. Each has a high graft where the branching begins. To your right is a low graft on a **blue noble fir (*Abies procera*)**. All four trees show a mismatch in growth rate between the graft understock and the cultivar, making this a group of "odd grafts".

Proceed to the paved path and left to the entry to the Perennial Garden. Look across to two large **15 - weeping beech trees (*Fagus sylvatica* 'Pendula')**. The broadly pendulous branches make this a popular photography spot. Head through the Perennial Garden and beneath the canopy of beech branches.

On your left are two **16 - Camperdown elms (*Ulmus glabra* 'Camperdownii')**, top-grafted trees typically growing to 15-25' tall with a rounded crown of weeping, contorted branches. The rough bark of the understock contrasts with the smoothness of the grafted cultivar. This elm's ancestor was found around 1840 in Dundee, Scotland in the forest of the Earl of Camperdown. The young contorted elm was replanted in the Earl's garden, where it is still growing on its own roots.

Follow the paved path between the elms and at the junction turn right onto the Laburnum Walk, which forms a tunnel of golden blooms each May. Shortly past the curve in the path on your left is a **17 – golden laburnum (*Laburnum* x *watereri* 'Vossii')**. At about eye-level is a long bolt holding two upright limbs together. These laburnums tend to have narrow branch angles, which can cause included bark, interior rot and weak branch unions. Several of these trees have needed the extra support of strong bolts.

Continue straight on the paved path under the weeping beech toward the restaurant. Stop at **18 - cristate Japanese cedar (*Cryptomeria japonica* 'Cristata')** beside the stone pillar. Notice its wide, flattened branch tips, an abnormal growth pattern called fasciation. Fasciation is usually a mutation on the meristem but can also occur on leaves, flowers, fruit, or roots and also is sometimes caused by injury or disease.

Pass between the stone pillars, then left down the stairs and right into the White Garden. At the edge of the bed on the left is a spiky plant with photosynthetic stems **19 – Japanese bitter orange (*Poncirus trifoliata* 'Flying Dragon').** Its formidable thorns readily invite comparison to dragons!

Continue down and right to the tall ceramic planters of **20 - pitcher plants (*Sarracenia* species) by** the Phyllis Bentall Garden pool. Try peering into the pitchers, which are special modified leaves**.** See if you can find some that are full of dead insects. Insects provide extra nutrients that are not available to these plants in their native swamps and marshes.

This concludes your tour. Thank you for visiting VanDusen Garden today. To enjoy some botanical oddities and surprises from tropical climates, we welcome you to visit the Bloedel Conservatory at Queen Elizabeth Park.