

BOTANIC GARDEN PROFILE:

DAWYCK BOTANIC GARDEN

David Knott¹

Dawyck became the third Regional Garden and part of the Royal Botanic Garden Edinburgh in 1978. Today the garden extends to some 25 hectares (60 acres) (See Map, Fig. 1) and is the woodland garden of what was once a considerably larger designed landscape centered on Dawyck House, which is currently a private residence. The garden today has some of the oldest plants in the Royal Botanic Garden Edinburgh's living collection including an *Abies alba*, planted in 1690, and several *Larix decidua*, planted in 1725. It has recorded perhaps the greatest extremes of temperature, -19.8°C in December 1995 and 29.9°C in August 2006, of any of the four gardens.

HISTORY

The first mention of Dawyck is in 1214, when it consisted of 416 acres or 32 ox-gates or davachs. Davachs were then a unit of land measurement and it is considered by historians to be where the name Dawyck is derived from.

The designed landscape inherited by the Royal Botanic Garden Edinburgh (RBGE) is the result of the planning and planting by three families during the last three centuries. The first of these families, the Veitchs, were responsible for the first introduction of several exotic trees into Scotland including *Aesculus hippocastanum* in the 1650's and *Abies alba* in the 1680's (Fig. 1) one of which still survives today in an area of the garden known as Heron Wood.

Ownership of the Dawyck Estate passed to the Naesmyth family in 1691. They continued Dawyck's tradition of being among the first estates to introduce new exotic tree species. These included *Larix decidua* in 1725, of which today three still survive, *Pinus pinaster* in 1742, *Abies balsamea* also in 1742, *Populus nigra* var. *italica* in 1765, *Acer saccharum* in 1754 and *Picea glauca* in 1759.

The Naesmyth family also subscribed to the plant collecting trips of David Douglas and Thomas Lobb. At least two of the surviving *Pseudotsuga menziesii* are reputedly original Douglas introductions planted in 1835 and many of the large *Sequoiadendron giganteum* are reputedly plants from Lobb's seed.

Their attention to tree planting was not solely confined to the introduction of exotic tree species. The planting of *Pinus sylvestris* on the south side of the Scrape Burn and extending beyond the present day garden boundary dates from the 1820's and was

¹David Knott is Curator of Dawyck Botanic Garden and the Outdoor Living Collections at the Royal Botanic Garden Edinburgh

Address: Royal Botanic Garden, 20A, Inverleith Row, Edinburgh EH3 5LR.

Email: D.Knott@rbge.ac.uk

undertaken with plants grown from seed originally collected from the Forest of Mar, Aberdeenshire.

It was also during this period that a fastigiate *Fagus sylvatica* was discovered growing on the estate. This was transplanted to a position just to the south of Dawyck House where it still stands today. It was not until the early part of last century that the then new owner of Dawyck Estate, F.R.S. Balfour, distributed propagation material from this tree that it was given the clonal name 'Dawyck'.

Mrs Alexander Balfour acquired Dawyck in 1897 and it was her son, F.R.S. Balfour, who became keenly interested in the garden and its plants. Among his introductions to Dawyck was *Picea breweriana*. He was so impressed with it that after seeing it growing in the wild in the Siskiyou Mountains, Oregon, he arranged for plants to be dug up in the wild and transported back to Dawyck where they were planted in the garden. The results of this work can be seen today as there are several still growing in the garden.

F.R.S. Balfour also subscribed to Ernest Wilson's plant collecting expeditions to the Far East and, in particular, China. When Wilson collected for the Arnold Arboretum, Boston Balfour organised the European seed distribution for the then director of the Arnold, Charles Sprague Sargent. Dawyck's links with the Arnold Arboretum continue to this day, as part of the garden is known as 'Sargent's Garden'. Wilson himself visited Dawyck in 1911 and 1922, no doubt to see how well his plants were becoming established and his legacy can still be seen in the shape of a fine *Abies koreana* in the southeast corner of the garden and the many large old rhododendrons.

F.R.S. Balfour died in 1945 and his contribution to the plant collections at Dawyck can still be seen in the many fine *Rhododendron*, *Cotoneaster*, *Sorbus*, *Betula* and *Acer* he planted in the garden.

In 1968 southern Scotland was ravaged by storm force winds which left many trees uprooted in its wake. The effect on Dawyck Estate and, in particular, its arboretum was immense with a considerable number of trees uprooted or destroyed. In 1979, the son of F.R.S. Balfour, Lt Col Alastair Balfour gifted the arboretum to the nation. There were



Fig. 1 *Abies alba* planted in the 1680's growing in the area now known as Heron Wood. Photo: David Knott.

several reasons why Dawyck became part of RBGE. The first was the nucleus of fine specimen trees that had survived the 1968 storm and their history. Second, the almost continental climatic conditions, which differed markedly from oceanic Benmore and subtropical Logan. Finally, the space it offered to cultivate many new plants especially those from cooler, drier parts of the world.

LOCATION, TOPOGRAPHY, SOILS AND CLIMATE

Dawyck is located 45 km south of Edinburgh in the Scottish Borders and is situated on the banks of the upper reaches of the river Tweed in an area known as Upper Tweeddale. Located within the Southern Uplands, the surrounding hills have distinctive rounded tops and steep slopes as the result of glacial action. The garden lies on the northwest slope of The Scrape, a hill rising to 719m and is an outlier of Broad Law which at 840 metres is the highest point in Tweeddale.

The soils within the garden have been created by this same glacial action and, as a result, are quite variable. The largest area of the garden comprises of a shallow stony loam with the stone size ranging from gravel to quite large boulders with several pockets of peaty soil along the streamside. The soil pH is naturally low and acidic.

The ground within the garden map (Fig. 2) rises from 165m at the car park to 250m at its highest point in the south east corner. From the entrance the ground rises steeply to

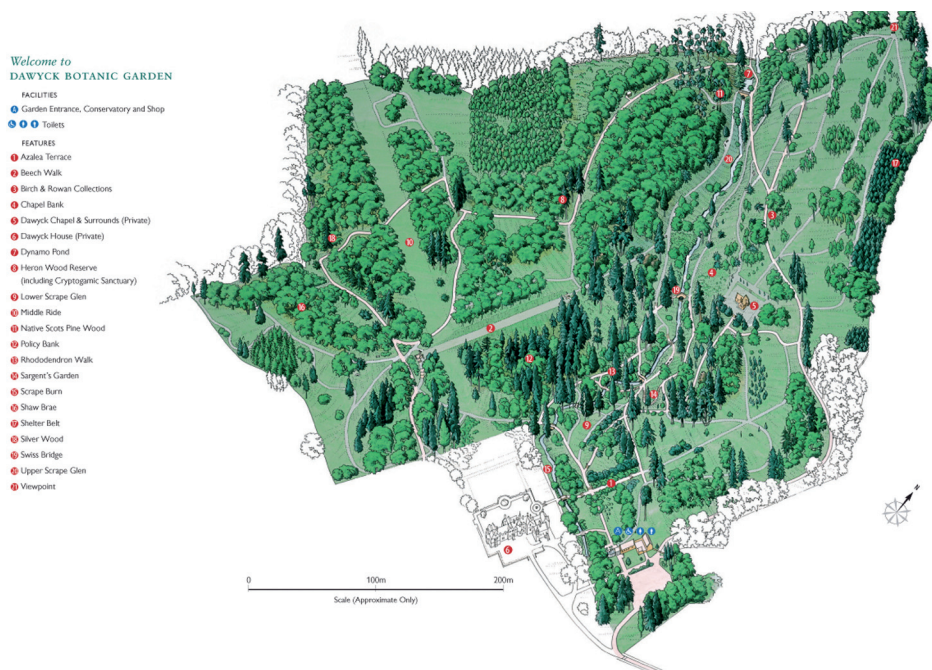


Fig. 2 Map of Dawyck Botanic Garden. Map: David Mason.

the southeast before dropping down to meet the Scrape Burn which bisects the garden. From the burn the ground rises steeply again to the south east until reaching its highest point. These slopes afford varying aspects and, with the burn providing further microclimates, a wide range of suitable locations are available for planting.

The relatively high altitude of the garden with its inland location results in Dawyck having an almost continental type climate. This means relatively warm dry summers with temperatures exceeding 27°C being common and relatively cool dry winters with air temperatures falling below -15°C on occasion. The last air frost can be expected during the last week of May and with the first air frost expected during the last week of September, the growing season is relatively short. In some years spring frosts can cause considerable damage not only to flowers but to growth as well. Small trees in full growth can be killed outright.

Annual rainfall is in the region of 1000mm but owing to the shallow soil and the sloping aspect a week without rain soon becomes a drought.

A REGIONAL GARDEN OF THE ROYAL BOTANIC GARDEN EDINBURGH

Dawyck Botanic Garden officially came into being in 1978, with the aftermath of the 1968 storm very much in evidence. There was much work to be done, many of the remaining trees required extensive remedial arboricultural work and the most dangerous trees had to be removed. This work provided invaluable arboricultural training to a generation of RBGE D.H.E. (Diploma in Horticulture Edinburgh) students. Large tree roots were also scattered widely throughout the area of the garden and they had to be removed. Many areas had also become overgrown with *Rubus spectabilis* (Salmonberry), a North American raspberry, and this had to be cleared. It was first introduced to Dawyck in 1908 by F.R.S. Balfour as a plant for game cover but with the increased light levels and disturbance created by the storm it spread rapidly through large areas of the garden creating impenetrable thickets.

After the successful clearance of several large areas came the opportunity to replant with a limited number of specific genera suited to the harsher montane climate including conifers such as *Pinus*, *Abies*, *Picea* and *Juniperus*. Other genera planted included *Betula*, *Berberis*, *Cotoneaster*, *Spiraea*, *Sorbus* and *Prunus* with a limited number of *Rhododendron* species. Many of these new plantings were of known wild source, having been grown from seed collected in the wild. These new plantings of wild origin material meant that Dawyck had started to fulfill its role as a Regional Garden of the Royal Botanic Garden Edinburgh.

Dawyck is extremely fortunate in having a natural water feature, the Scrape Burn, running through the garden (Fig. 3). Clearance work on the Burnside allowed existing plants to be rescued and perhaps the finest of these was a form of *Meconopsis* x *sheldonii*, whose origins are unknown. They have now been nurtured back to vigour and in recent years large bold plantings of this *Meconopsis*, now called 'Slieve Donard' have produced eyecatching displays along the streamside.

Other moisture loving herbaceous plants such as *Astilbe*, *Hosta*, *Ligularia*, and *Rodgersia* were introduced and in some cases re-introduced. They are now fully utilising this exciting microclimate. The other aim of these herbaceous plantings was, with the careful selection of plant material, to extend the seasonal interest into the later summer months for garden visitors. With plants of the previously mentioned genera this was relatively easy as they flower naturally during this period.

As the quality of the living collection increased so too did the number of visitors and, as a consequence, improvements were continually made to the facilities for visitors. From 1985, with a new car park and the construction and clearance of a number of new paths Dawyck was ready again to welcome a limited number of visitors. In 1993, a small conservatory was built, and a member of staff employed to collect admissions, serve refreshments and sell plants and gifts. The facilities have proved extremely successful resulting in visitors increasing to 23,000 and at the time of writing the garden has plans to further improve the facilities.

Since 1995, in tandem with the improvements to the visitor facilities further advances have been made in improving the physical and intellectual access to the garden. Several new bridges were constructed and, with their associated paths, improve visitor access

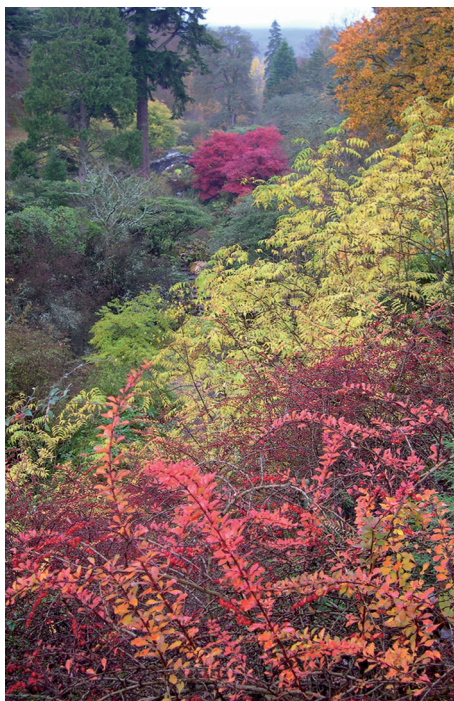


Fig. 3 Scrape Burn looking up to the Swiss Bridge in autumn showing berberis, *Sorbaria* sp., *Sorbus alnifolia*, and *Acer palmatum*. Photo: David Knott.



Fig. 4 *Platananthera bifolia*, the greater butterfly orchid has reappeared after a 10 year absence from Dawyck, following a change in the grass cutting regime. Photo: David Knott.

along the Burnside. In the rest of the garden, a network of mown grass paths give visitor access to the living collection.

In 1996 Dawyck's first ever guidebook was written, complete with a way-marked recommended route. In the same year the world's first Cryptogamic Sanctuary within the Heron Wood was established in 1996. 1999 was the bicentenary of the birth of Scottish explorer and plant collector David Douglas and with generous funding from the Scottish Forestry Trust a trail marking his achievements, collections and his impact on the Scottish scenery was launched. To highlight the pressures on our own native flora 'The Scottish Rare Plant Trail' was created in 2000 in collaboration with Phil Lusby, this being subsequently upgraded during 2006 to take account of RBGE's work with Target 8 of the GSPC by Natacha Frachon and Heather McHaffie.

Today a team of 5 staff undertakes the maintenance of the garden that would have been undertaken by a team of perhaps 15 or 20 staff in earlier times!

Needless to say a number of labour saving practices and techniques have been introduced. These include the use of bark mulch on all new plantings and a complete change in the grass-cutting regime that not only saves time but has also increased the biodiversity of the sward. Several new vice-county records have been made in recent years including the Greater Butterfly Orchid *Platanthera chlorantha* (Fig. 4) and the Broad-leaved Helleborine, *Epipactis helleborine*. An investment in the right machinery for the job such as the purchase of a tractor and flail unit capable of cutting grass on the steepest slopes (Fig. 5) has again saved a considerable amount of time. However none of this would have been possible without the dedication of the garden staff over the years.

THE PLANT COLLECTION TODAY

The plant collection at Dawyck is part of the living collection of the Royal Botanic Garden Edinburgh, as are the plant collections at the other Regional Gardens, Benmore Botanic Garden and Logan Botanic Garden. To ensure that the living collection is well managed and curated both in the present and in the future RBGE has had a Draft Acquisition Policy written in 1994, and now a more comprehensive Collection Policy for the Living Collection. (Rae *et al.* 2006).

Since 1994 the following plant groups and genera have been and are still being actively added to the living collection at Dawyck: *Abies*, *Acer*, *Berberis*, (Northern Hemisphere species) *Betula*, *Cotoneaster*, northern temperate Ferns, *Larix*, *Metasequoia*, *Rhododendron* subsection's *Fortunea* and *Taliensia*, *Picea*, *Spiraea*, and *Sorbus*. A more detailed list of the family and genus designation for Dawyck appears in Appendix VI of the Collection Policy (Rae *et al.* 2006). From the entrance either side of the Scrape Burn to the Swiss Bridge all new plantings, apart from the historic core of the garden have, and are being, planted according to their phytogeographic regions (Fig. 3).



Fig. 5 Cutting grass with new equipment reduces maintenance time and increases the diversity of native plants growing at Dawyck. Photo: David Knott.

The emphasis has been on sourcing and planting plants of known wild origin, with associated minimum data standards at the time of collection, see Fig. 6 and Thomas and Watson (2000) for further information. The number of wild origin accessions as a percentage of the total number of accessions has increased from 38% in 1988 to 61% as of February 2007.

Many plants added to the living collection at Dawyck since 1988 have been collected on RBGE led expeditions (see RBGE Catalogue of Plants 2006 for a more complete expedition list) and in particular on the following expeditions:

- 1989 – KEKE to Kanchenjunga region, eastern Nepal
- 1990 – CLD to Yunnan, south west China
- 1991 – EMAK to Makalu region, eastern Nepal
- 1991 – CEE to Sichuan, south west China
- 1995 – FED to Yunnan, south west China
- 1996 onwards GSE expeditions to Gaoligongshan region, Yunnan, south west China
- 2001 – ENEP to central Nepal
- 2003 – EJE to northern Japan
- 2004 – DNEP to Khumbu region, Nepal

Now, after over 25 years of sustained planting of new wild origin material, we have reached a particularly exciting stage in the living collection at Dawyck, as each year

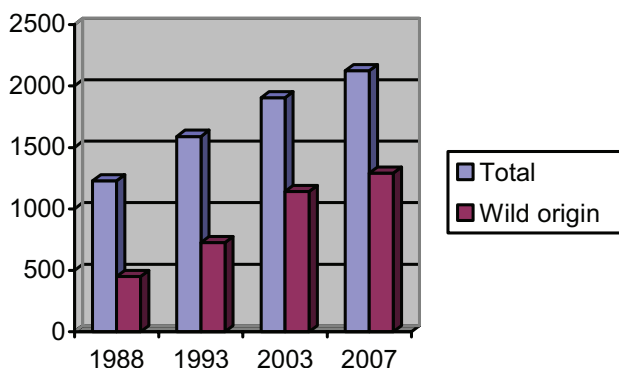


Fig. 6 Total number of accessions and number of accessions of wild origin growing at Dawyck 1988-2007

plants are flowering and fruiting for the first time and it is particularly exciting if it has been a long wait or if it is a plant with which you have had a particular involvement. It can take 10–30 years for woody plants to flower for the first time. An example of the former is the first flowering of *Cornus kousa* 19810784C in 2003. Seed was collected in 1980 in the Shennongjia Forest Region Hubei, Central China on the Sino-American Botanical Expedition, one of the first plant collecting expeditions allowed into China after the revolution. An example of the latter is the first flowering of *Rhododendron calophytum* 19952865F in 2005 (Fig. 7). Seed was collected in 1991 on the Erlang Shan in Sichuan, China on the Chengdu, Edinburgh Expedition.

THE FUTURE

Gardens are truly dynamic places and no two days are the same, let alone any two weeks, months or years. Planning for the future is, or should be, an integral part of any garden manager's job. However anticipating where future problems will occur is perhaps not quite so easy. One night's severe weather, be it flood, gale or heavy snow, can create enough clear up work for 3–5 years with the resultant effect on resources and forward planning. That the climate is changing is undisputed and at Dawyck we are beginning to see and record the initial short-term effects such as more intense rainfall, longer drier spells and record maximum temperatures. What the long term effects on the plant collection will be, particularly on the oldest trees at Dawyck, we cannot be sure but like previous generations of custodians we will continue to plan and plant for the future.



Fig. 7 *Rhododendron calophytum* a CEE collection flowers for the first time. Photo: David Knott.

REFERENCES

- MCBEATH, R. *et al.* (1994). *Draft Acquisition Policy*. Royal Botanic Garden Edinburgh. Unpublished.
- RAE, DAVID *et al.* (2007). *Collection Policy for the Living Collection*. Royal Botanic Garden Edinburgh ISBN 1 872291 60 0.
- RAE, DAVID *et al.* (2006). *Catalogue of Plants 2006*. Royal Botanic Garden Edinburgh ISBN 978 1 872291 75 9.
- THOMAS P. & WATSON M. (2000). *Data management for Plant collections – A handbook of best practice*. Royal Botanic Garden Edinburgh ISBN 1 872291 58 9.
- WATLING, R. (2007). Cryptogams in a horticultural setting. *Sibbaldia* Vol.5: 109–114. ISBN 978-1-906129 08 8

