Exchange visit between Dresden Botanic Garden and Royal Botanic Garden Edinburgh

Pat Clifford **June 2013**

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In May 2013 I was fortunate enough to spend a fortnight working and learning in Dresden Botanic Garden (DBG.), this was made possible through funding provided by "Stiftung Internationaler Gartneraustausch". The previous September, Mr Dirk Fietsch, the Glasshouse Supervisor in Dresden visited the Royal Botanic Garden Edinburgh (RBGE) and work shadowed me for a fortnight. I believe that Dirk thoroughly enjoyed his time spent in Edinburgh and I was hoping to come away from Germany with a similar positive experience - I was not to be disappointed.

At the RBGE we employ an Integrated Pest Management (IPM) strategy and we endeavour to use as many biological agents as we can to control any pest problems, whereas in Dresden biological controls are used exclusively. I was particularly interested to see how effective this strategy proved to be in practice, and was hoping to learn more about Dresden's approach to pest control and implement these innovative practices in my own workplace. Another aspect which really interested me was the cultivation of aquatics particularly the genus *Victoria* and *Nymphaea,* as these are my specialist plants in my glasshouses in Edinburgh. I was also very interested in the aquarium set-up as in addition to the two public display glasshouses and back-up collections I also maintain 15 large tanks back home in the R.B.G.E.

After an eventful flight into Dresden via Frankfurt I arrived a day late in a torrential rainstorm, of course nothing new to me as I live in Scotland. As I arrived over the weekend I was able to spend the first two days wandering around the picturesque city centre familiarising myself with Dresden and its many places of interest.

Historical Dresden

I caught a tram on Monday morning and arrived bright eyed and bushy tailed for work. The garden in Dresden was founded in 1817 and grew rapidly under the Directorship of Heinrich Gottlieb Ludwig Reichenbach who was in charge for a remarkable 59 years! The garden moved to its present site in 1891 and here it has flourished. The first thing I encountered was the historic entrance gates which were incredibly impressive. Next was a whistle-stop tour of the garden to get acquainted with all the areas I would potentially be working in and a member of staff gave me a short induction including health and safety protocol. On initial observation, I was really impressed with the maturity of the trees in the garden and Dirk pointed out the two *Gingko biloba* trees which were transplanted from the original site in 1893. As RBGE was relocated to the present site in 1820 we also have some very mature specimen trees out in our garden, however in the glasshouses we have one of the oldest plants in our collection of which we are particularly proud. The centrepiece within our Tropical Palm House (which was built in 1834), is our *Sabal bermudana* which stands around 20m in height. We believe that this plant is well over 200 years

old as it was transplanted from our previous garden site in Leith in 1820. Interestingly, there is speculation this *Sabal* was a seedling imported from Germany in the late 1700's. Leith at that time was a major trading port with Northern Europe. The plant needs careful management as its crown fills the Victorian dome and by monitoring the growth rate over the years we can speculate that within 10-15 years it will have to be removed as it will have outgrown its space which will be a sad loss to the garden, planning is already in place for a replacement specimen.

The Sabal bermudana reaching maximum height in Edinburgh

The move to our present site was only our latest. Our garden in Edinburgh has moved four times since its conception as a physic garden in 1670 and had the Royal Warrant bestowed upon it by King William III in 1699 before moving to its second site nearby Edinburgh Castle and then on to Leith in 1763.

Needless to say DBG is a much smaller garden than RBG and to illustrate the difference I have included some facts and figures:

	DBG	**RBGE**
Total Area	3.5 hectares	31 hectares
Public Display Glasshouses	1000m	5000m
Annual Visitors	100,000	800,000
Number of taxa	10,000	18,000

Looking at these figures, you can see how the gardens compare in size, but the amazing statistic is the relatively small difference in plant taxa for their comparative size. Although DBG is a very small and intimate garden it is jam-packed with delightful surprises and rarities. We have four remarkable gardens that comprise the Royal Botanic Garden Edinburgh, each one representing a different climatic zone; again this is similar to the set up in Dresden and as well as spending time working in the main garden I also visited two of the satellite gardens, one at Fichtelberg and the other at Bosel , both of which I will mention in more detail later.

The main job I was involved with in the glasshouses was preparing the Victoria House for planting a selection of aquatic plants, getting everything ready for the subsequent opening in the summer season. This involved planting up an epiphytic tree and moving several large containerised plants back into the glasshouse, which had spent the winter months in alternative display and back-up glasshouses. There was some frustration from the staff moving all these huge containerised plants back and forth twice a year, but I'm sure once the adjacent ground finally becomes available and funding is secured a Temperate Glasshouse will be the top priority. It will make life so much easier keeping the Victoria House permanently tropical and I think an all year round display will enhance the whole garden.

Epiphytic tree fully planted

Time consuming job, moving the large containerised plants.

Another job I helped with was planting out some summer bedding around the hard standing area where the vast temperate collection is displayed throughout the milder months. I was helped in this task by some of the apprentices who kept me on the right track as I can't remember the last time I was involved with any of this style of planting outside. I'm really only half-hardy as I have worked in tropical glasshouses for so long.

I was really impressed with the apprentice scheme the garden participates in and all the trainees seemed very knowledgeable and highly motivated. We have just started a similar programme here in Edinburgh and although still in its infancy I'm sure we could learn a lot from DBG who have been successfully running their scheme for some time.

On a daily basis I undertook the watering of the main public tropical house which was a fairly easy and enjoyable task, this meant every morning I could spend some time familiarising myself with the plants in the house, some of which were new species to me. Unlike back home the water was treated to a high degree whereas we use water straight from the tap, we are lucky in Scotland that we have soft water which contains very little Calcium Carbonate. The water treatment facility was state of the art and completely baffled me; thank goodness Dirk understood the system as his job was to maintain it as well as making sure everything operates smoothly. Thankfully we have a Maintenance Department in Edinburgh who take care of all our climate control problems including the water supply.

This leads me onto the fish aquariums which really interested me as we have a similar amount of tanks and fish to care for. It must be said that compared to DBG Edinburgh has a little catching up to do and the tanks were a credit to staff that cared for them in Dresden. In defence of RBGE we don't have the same up to date equipment, or resources as our aquaria were built in the early sixties. Since my return I have tried to push through some changes, using some of the knowledge gained in D.B.G. The aquariums are now much improved and I have to thank the staff in Dresden for their suggestions and encouragement. I am now in the process of creating a specific tank to house Malawi Cichlids, which will be quite a challenge, although interesting to show these fish alongside their native plant species. Also I have just learnt from Dirk that they are now installing another new filtration system in Dresden, oh to have such investment!

Beautifully landscaped

Amazing Aquariums

While being shown round the glasshouse I was amazed to hear the story of the Cycad: *Dioon spinulosa.* This plant was the only pre-war glasshouse exhibit to survive the catastrophic bombing of the city which occurred on February 13th 1945, when 19 high-explosive bombs landed in the gardens. The administrative building and most of the glasshouses were destroyed and legend has it that one brave gardener used a wheelbarrow to transport the plant through the city streets to Pillnitz 10km away which still had an intact glasshouse. This story was a poignant reminder of one of the blackest days in Dresden's long history.

Dioon spinulosa, the rescued cycad

The biological control of pests in the glasshouses seemed to be working quite well and made me re-consider our use of pesticides. The problem with using only bio-control is when there are sudden outbreaks of pests it can be very difficult to get on top of them again. Whilst this may be slightly more acceptable in our public houses we cannot allow this to happen in our back-up areas where plants are grown to support our eight major research collection groups including globally important collections of Zingiberaceae and Gesneriaceae along with several PhD and MSc projects, therefore a zero tolerance approach is the standard. I fully realise as laws become stricter in the use of pesticides this is an issue which will need to be addressed, I think we need to start by educating the general public on natural eco-systems. It won't be easy though as in my experience many people have a very false idea of how tropical plants look in the wild i.e. perfect. Fortunately both the public display houses I take care of in Edinburgh have large ponds containing lots of fish which rules out the use of pesticides, so I only use bio-control and I'm sure that Dirk and I learned some valuable tips from each other over the course of the

exchange. One of the more novel bio-controls is the use of Asian Dwarf Quail, which undoubtedly must reduce the cockroach numbers significantly; I fell in love with them and really want some in Edinburgh.

My new friends the Asian Dwarf Quail

As I watered the Tropenhaus in the morning they would follow me around chirping and scraping in the leaf litter as I disturbed the various insects. I am a little wary about putting them in my glasshouses though because neither of the ponds have barriers around them and I can imagine visitors getting the shock of their lives as they scurry out the undergrowth which may have undesirable and slightly damp consequences!?

Tropical glasshouse in Dresden

Clerodendrum speciosissimum in Tropenhaus

As more and more pesticides are removed from public and professional use the subject of pest control in glasshouses is one that Botanic gardens throughout the world will have to consider and plan for in the near future and D.B.G. is certainly leading the way!

Fichtelberg Garden

This tiny garden (10m x 30m approx.) was founded in 1917 and is situated at the highest point in Saxony at 1014m altitude; here DBG cultivates their native alpine flora. Amazingly we drove right up to the gates and the little plot was only a stone's throw from a 5 star hotel, very handy indeed. In Scotland we have a similar plot of land situated in the Cairngorm mountain range about 200km north of Edinburgh, where we do a similar type of planting. This site is incredibly remote and is pure physical torture to access and the only thing within a stone's throw is, well absolutely nothing. (Probably another stone?)

I went to the plot with a party of apprentices led by the Curator Barbara Ditsch, whose knowledge of the local flora was extensive and very impressive. This was great because my knowledge of this type of flora is non-existent; I also think my feet are too big to successfully work with Alpine plants!?

This was the first visit of the growing season so the main tasks were weeding and making an inventory of all the plants, mainly to check they had all survived the harsh alpine winter. There were labels to order, some for new plants which had survived their first winter, and some replacement labels for those damaged by the snow. The weather was unbelievably bad, in fact so much so that I was nearly feeling homesick.

Lovely 'Scottish' weather

I had been hoping to see the awesome views over the mountains into the Czech Republic; unfortunately I was lucky to be able to see my hand in front of my face because of the fog and drizzle. I'm not complaining though, we had a lovely lunch in a café next to the Fichtelberghaus and I even tried nettle (*Urtica*) soup for the first time and it was very tasty and warmed us up!

Pulsatilla alpina

At Fichtelberg

Primula veris at Fichtelberg

On the way back to Dresden, Frau Ditsch was the perfect and knowledgeable tour guide and taught me all about the history of this fascinating region which was greatly appreciated.

Bosel Garden

We visited this other satellite garden of DBG on the second week of my stay. This small garden is situated around 30km from Dresden, near Meissen, in an area where there are many vineyards. This means the site has a different climate and geological structure from the surrounding areas. We drove there through some beautiful countryside lying alongside the river Elbe.

This garden was first planted up in 1908 on the edge of a working quarry which only closed in 1948. This seemed to me to be a very challenging site to locate an outstation and as I was about to find out it truly was. Access to the site was very limited which meant bringing in materials was incredibly challenging, there was no mains water or electricity and considering that the site is on a slope the irrigation during the hot summer months using a watering can must take a lot of dedication and patience.

The Bosel Garden

Although the garden was small (25m x 100m) it was packed with both native plants from the Elbe hill country 'Elbhugelland' and non-native species from around the world. There was only one full time horticulturist who worked there permanently in the summer and although that obviously suits some people I think that the isolation would probably have driven me crazy. In saying that, the sense of peace and tranquillity in this beautiful garden was truly magical.

Matteuccia struthiopteris at Bosel

Conclusion

By meeting so many people with their vast reservoir of knowledge and skills, my experience will truly benefit the RBGE over the coming years as I continue to tap into this unique source and I look forward to sharing the information and techniques I discovered.

Participating in this exchange programme was really one of the most fulfilling experiences in my career and will live with me for a long time and writing this report has brought back so many fantastic memories. I was fortunate to meet so many like-minded people and I came back from the exchange not only with great memories (and 600 photos) but also with a renewed enthusiasm and interest. All this reinforced the theory that I already had - I must have one of the best jobs on Earth!

Everyone made me feel so welcome

This only leaves me to say many thanks to everyone who made this unique and truly career enhancing experience possible.

Thanks

Pat Clifford

Royal Botanic Garden Edinburgh 2013