

**2022-2023 Royal Horticultural Society/Garden Club of America  
Interchange Fellowship  
Silas Zoeller  
Mid Term Report**

As I began my new journey as the RHS Interchange Fellow I'm unsure whether nerves or excitement were in greater abundance! Having never been out of the country before the idea of international travel was both daunting and thrilling. Those first nervous hours quickly subsided though as I was graciously greeted by Rowena at Heathrow Airport and whisked away to the vibrant garden community of RHS Wisley. Immediately blown away by the beautiful and impressive surroundings I remarked to Rowena that my head simply couldn't spin fast enough to take it all in, and my head hasn't stopped spinning since!

Within my first introductory week I already had the fantastic opportunity to visit Winkworth Arboretum, my first national trust property, courtesy of Rowena. I was in awe of the grand vistas and specimens of trees I had only dreamed of seeing, the legacy of Dr. Wilfrid Fox, a dermatologist with quite the enthusiasm for tree collecting! Before heading to Winkworth, I had done some reconnaissance to see what the collections held in store and I knew I absolutely had to see the specimen of *Castanea dentata*, the American Chestnut. Once a dominant part of the landscape in the Eastern US where I hail from, almost all of the trees were wiped out by the fungal pathogen Chestnut Blight introduced from Asia. This story has captivated me since before I began formally studying plants and has been an abiding influence on my sense of the importance of plant conservation. The mighty old tree did not disappoint, I had no idea that they were still successfully growing in cultivated settings, much less at this size! The chestnut wasn't the only jewel to be found in Dr. Fox's old treasure chest though as I was also stunned by an enormous *Nothofagus obliqua* and a freshly planted and thriving *Wollemia nobilis* (pointed out after some great conversation with the staff at Winkworth!) two more trees I had long been wishing to see. I had long heard tell of the breadth and diversity of plants able to be grown in the British climate but I was still shocked by the sheer number of amazing species we would be unable to grow back home that were seemingly all around me here, a feeling that has only continued to grow throughout the program.

After my excursion it was back to Wisley where I continued to be blown away by the incredible size and variety of the trees, and the grand color and texture of the herbaceous displays. Soon after my arrival the Wisley Flower show was underway and my first job was to steward for the National Dahlia Society judges, following the judges I got to see plants viewed in an entirely different way as the judges went over every minutia of the entries to the competition. To me all the entries were stunning coming from a region where dahlias are few and far between and frequently unhealthy even when they are grown, but it was fascinating to watch the flowers broken down and critiqued on petal arrangement, number, and many other traits.

When the flower show concluded I began my work at Wisley in earnest, joining the propagation team. While working in the propagation department I collected and stuck cuttings from the newly built world food garden to begin the growth of next year's edibles and herbs. I also assisted in repotting an impressive collection of *Yucca* species, it was interesting comparing and contrasting those that were being grown for Wisley with the range of yuccas we had been trialing for hardiness at my previous garden.

The next team I joined in with at Wisley was the Seed team who collect a vast number of seeds from across the gardens (and some other choice locales!) which are then cleaned and prepared for distribution through the RHS member's seed scheme in which members can request seeds from a large plant list sent out by the team. This was a great chance to get to know the gardens as we trekked all around looking for eligible plants with seed ripe for the picking. Led by horticulturist Lucy's know-how myself and a team of enthusiastic volunteers gathered seed from *Sanguisorba*, *Xerochrysum*, *Primula* and countless other plants. It was a great learning experience to see the diverse fruits and seeds of all these different genres, as well as picking up helpful tips on determining when seed is ready for harvest. These freshly collected seeds were then laid out to dry as we set to work on cleaning the seed that had been collected previously. All kinds of different methods were used depending on the type of seed at hand, from sieving with a variety of different steel meshes to using an aspirator for seeds with tiny and delicate debris. Aspirators allow for you to pass air over the seed at carefully controlled levels in order to separate debris, shells, fluff, etc. From the viable seed. It was quite enjoyable slowly mastering the skill of finding just the right air level to keep as much seed as possible while still removing any other excess material.

After a great time scouting and collecting with the seed team I rotated into the Alpine department, eager to finally get my hands in some dirt but with little knowledge of what constituted alpine plants and gardening. My first task and one which I continued daily during my time there was to curate the alpine display house which meant removing any plants which had the spotlight long enough or were through flowering and selecting from the vast array of behind-the-scenes plants things that were looking particularly good. This was a lovely way to start each day and I enjoyed both getting to know a whole host of new plants as well as the chance to put my own little spin on the rotating displays. In my case this meant adding some often-overlooked ferns, *Adiantum* species in particular, as well as a spectacularly beautiful *Selaginella moellendorffii* which was putting on its blazing bronze fall color at the time, showing that non-flowering plants can be utterly stunning too! The sand plunge system of caring for the potted alpiners and bulbs was also new to me and it was really interesting learning how to maintain it and its use as a system of controlling soil moisture. My love of working with ferns found further use in Wisley's fern glade where I assisted with lifting and dividing *Polystichum polyblepharum*, *Matteucia*, and various *Polypodiums* filling out some new areas and making others more readable. To cap off my time with the alpine team I got to create a flashy display of various *Cyclamen* cultivars and species as a centerpiece for the Cyclamen show hosted at Wisley.



Dwarfed by the American Chestnut (*Castanea dentata*) at Winkworth Arboretum



Boxes of seed in various stages of cleaning as they are prepared for the RHS seed scheme



Standing alongside the Cyclamen display I helped create for the Cyclamen society show at Wisley



A misty morning commute through Wisley's Welcome and Riverside area



Relinquishing control of the alpine display house I moved into larger digs as a part of the glasshouse team. I was quite excited for this placement as I had spent many a lunch hour wandering the house and appreciating the fantastic collections, especially the massive cycad specimens and variety of tree ferns, both personal favorites of mine. This was also my first experience with glasshouse horticulture, something which was a major goal of mine for the fellowship. I also checked off another bucket list plant, *Angiopteris evecta* a member of the ancient Marattioid ferns and owner of the title of largest fern leaf in the world! On my first day with the team, I worked in the arid section of the temperate side. I got to help arrange and plant out a variety of *Euphorbiaceae* and *Agave* filling out an existing display and also set to work trying to rescue an ailing *Encephalartos natalensis* which needed a bit of digging out as it had become buried a bit too deep over time. Then it was over to the tropical side of things where I worked both out in display, designing a fresh planting of bromeliads and *Calathea* as well as behind the scenes dividing up some bromeliads which had outgrown their pots and cleaning off *Amorphophallus* corms for their dormant period to prevent any rot or disease. The variety of tasks and plants was a fantastic experience giving me a chance to try my hand at propagation, design, combatting pests and disease and much more all alongside working with some of my favorite plant groups and other new favorites!

My final two placements with the curatorial teams at Wisley were in formal and woodland, both of which gave me ample opportunity to use skills I had learned previously and compare methodologies and workflow between my previous garden and Wisley. It was really interesting discussing the different benefits and drawbacks of mechanical bulb planters as opposed to hand planting, and also getting a chance to do some training of roses which was a new experience for me. In Battleston hill, the domain of the woodland team, I got to see massive specimens of *Rhododendrons* and *Camellias* that I had read about in the journals of Frank Kingdon-Ward and other plants collectors of yore which was a really inspiring and humbling experience. I also had a lot of fun comparing notes on woody plants I had worked with prior or that are native to my home state of Kentucky with the horticulturists and students on the team.

After these two rotations it was time for a big change of scenery as I moved into the new Hilltop science building at Wisley for some time with the science teams. First up was working in the herbarium, having previously visited the herbarium at Missouri Botanic Garden it was great to discuss methods, triumphs, and challenges with the team. Wisley's herbarium is unique in that it focuses mainly on cultivated plants, requiring specimens for cultivars as well as species. It was fascinating to see this focus brought to bear on the process of preparing new specimens for the collection as I set out into the garden with the intrepid herbarium volunteers to check off some new cultivars for the herbarium. Since color can be such an important part in the distinction of cultivars the specimens are pressed in a way that emphasizes color preservation and the plants are painstakingly compared with the RHS color charts to record the colors of all the parts of the plant and flower individually before drying. This information can later be used to compare with living specimens for identification, among myriad other uses. I also had the chance to spend quality time with the herbarium collections both in digitizing the collections for online public access and in sorting out some specimens that needed databasing or remounting. It was particularly amazing to see some of the older specimens including several collected by George Forrest on trips for the RHS to Yunnan and even a potato plant collected by Darwin himself!

After the herbarium came the plant pathology team, this team covers a broad range of topics including entomology, biosecurity, and molecular research regarding fungal pathogens. The first project I was shown was on *Armillaria* or honey fungus, in particular looking for plant resistance against this disease that causes root death in many woody plants. The RHS is doing a lot of research into both this and *Phytophthora*, both of which are major and worsening plant disease problems across the UK. This made for an interesting comparison with my home state, as both are present but not nearly as widespread due to climatic differences. This was also true of the large-scale slug survey done by the team at Wisley looking at diversity of slug species in gardens and training hobby gardeners in their identification. Slugs are also not particularly common where I come from and I had noticed their prevalence in the gardens around Wisley so seeing the identification guides and collected specimens of all the different species was really fascinating. One of the best parts of my time with the pathology team was the chance to get back into a lab for the first time in a long time. This included looking for the chlamydospores (a spore structure produced to survive through adverse conditions) of *Phytophthora* in soil samples to confirm its presence. My rusty microscopy skills managed to net an apparently excellent photo of one of these structures, to the delight of the researcher I was assisting! My work with *Phytophthora* also included plating up some new colonies of the fungus on fresh agar for further incubation. While with the team I also got to sit in on a meeting focused upon the development of a document pertaining to invasive species policy at the RHS. The regulation and determination of invasive species is a bit of a hot-button issue in US horticulture at the moment and was one of the things I most wondered about coming into the fellowship. It turns out that the issue is still considered an important one here but is dealt with very differently considering the number of naturalized species in the UK and the difficulty of determining at what point a plant is no longer 'native' due to the long history of plant introductions all the way back to Roman times. It will be interesting to see if the rise in rhetoric surrounding the issue across the pond ends up affecting the discussion here in the UK in the near future.

To end my time with the Wisley science departments I spent a week with the plant taxonomists. I helped out with inquiries for identification from members. This was an interesting opportunity to gain familiarity with the use of various floras, keys, and plant dictionaries both in print and online. The botanists also gave me a rundown of the main issues and tasks associated with cultivated plant nomenclature. Horticulturists often lament the frequent name changes and reorganizations of taxonomic groupings so the chance to see the actual people and processes behind these sorts of actions was a great opportunity to dispel any notions that these decisions are made flippantly. There are quite a few hurdles to jump through in order to get one of these reclassifications through, and the taxonomists at Wisley and elsewhere are quite dutiful in tracking down good reasons for the changes. We also discussed cultivated plant names and the increasingly frequent trend of nonsensical cultivar names as a way to maximize a breeder's right to the plants, and how this is intertwined with trade names. It was fascinating to compare the climate on this issue between the UK and US, and the differences between PBR (Plant Breeder's Rights) and patents/copyrights respectively. Overall this was an extremely informative and useful look into everything that goes into naming and properly identifying plants.



A lush view from the tropical section of the Wisley Glasshouse displaying diversity of foliage texture



Scything in the wildlife garden, this method is less dangerous for the wildlife living in the meadow



Chlamydospore of *Phytophthora* isolated from a soil sample under a microscope



*Agave attenuata* in flower for the first time in the arid section of the Wisley glasshouse

While at Wisley I also took every chance I got to travel out to other gardens and places of interest. Visiting London soon after my arrival in the UK I had to check out Chelsea Physic Garden, which I had heard much about from former fellows. Chelsea Physic hosts an extremely storied apothecary garden, full of plants useful for medicine, food, and even a bed devoted to poisonous plants! The diversity this affords the gardens is really quite amazing, and I was happily surprised to find some representatives of some personal favorite plant groups in their small glasshouse. These included the smallest representative of the horsetail genus, *Equisetum scirpoides*, and a rare cycad with the distinction of having its genus all to itself *Stangeria eriopus*. Another garden visit was found within walking distance of Wisley at the open day for a small private garden, Dunsborough Park. I found this lesser-known locale to be a real gem with some fantastic views and a really charming and intimate style. As fall rolled around, I had to go see Sheffield Park and its famously lush fall color and a venture out with some of the Wisley students proved well worth it. The sweeping vistas (my first taste of the legendary Capability Brown's design) did not at all disappoint, and tremendous individual specimens also weren't in short supply, including a scrappy little *Betula utilis* growing fully off the ground out of the decaying stump of an old giant. Looking for another taste of grand landscapes and Autumn atmosphere I headed out to Painshill and was met with a garden unlike any I had seen in the US. The garden is laid out specifically for strolling from excellent view to excellent view with little care as to individual plantings or the collecting of specimens. These views are accented by delightfully whimsical 'follies', flashy structures meant to echo other locales or foreign styles of architecture. While I'm not sure some would keep up with modern sensibilities, they are nonetheless a series of fun little delights set into the landscape and I had a great time walking to each and every one! Though specimen trees certainly aren't the focus of Painshill I would be remiss not to mention the absolute glee I found in a beastly old *Quercus suber* held up by a large wooden crutch and putting on display perhaps the most fantastic bark I've ever seen. An outing with the Wisley students on their masterclass regarding the management of historic properties took me to the gorgeous Wrest Park. This garden really fulfilled my vision of an English estate garden and manor house and it was really fascinating learning how the gardens and management practices had changed through the ages alongside the Wisley students.





Stunning vista over out across the pond at Dunsborough Park



Carefully considered and maximized displays of Autumn foliage at Sheffield Park



The magnificent *Quercus suber* at Painshill Park



The beautiful manor house at Wrest Park



Smart landscape design draws you and your eye to the gothic temple folly at Painshill Park

With my time working at Wisley having come to a close and feeling refreshed by a visit home for the holidays I began the marathon of new-year placements by traveling to Wales. I'd been recommended a placement with the National Botanic Garden of Wales based on their track record of plant collecting, and the diverse Mediterranean collection held within the great glasshouse. The majority of my time was spent working with the glass team which meant rotating between the nursery glasshouses, great glasshouse, and tropical house on site at the gardens. My experience with Mediterranean plants was extremely limited coming into the placement as they are quite rare to see even under glass in my part of the US. This meant a chance to encounter and learn a vast number of new plants from the regions highlighted within NBGW's great glasshouse. As I assisted in pruning and cutback in the glasshouse I learned the names and habits of South African *Proteas*, Australian *Hakeas* and *Grevilleas*, the lovely *Canarina canariensis* from the Canary Islands, and shining bronze barked *Arctostaphylos* from California just to name a few. Spending time in the back of house I helped to repot a variety of succulents, and a few of the remarkable cycad specimens the garden had recently received from a private collector. I also got a crash course on orchid repotting and marveled at some of the rarities growing behind the scenes, which meant of course checking off more bucket list plants! One of the plants I was most excited to find there was *Welwitschia mirabilis*, a plant endemic to the deserts of Namibia long thought to be a relic from the transition between Gymnosperms and flowering plants. *Welwitschia* grow only two leaves in their lifetime and gather all their water from fog banks that roll across the Namib desert. At the botanic garden the plants had been raised from seed in pure sand and were just beginning to put out their leaves, watch this space! Another plant particularly special to me was the several small specimens of *Amborella trichopoda* thought to be the 'basal angiosperm', basically the extant flowering plant with the oldest lineage in the world. The plant only grows one place in the world, New Caledonia Island, I had done a project on New Caledonian flora during the course that really kindled my passion for ancient plants while at university and had eagerly looked through the pressed specimens when visiting the herbarium at Missouri Botanic Garden during my apprenticeship, and now here I was seeing it in person at last!





View from inside the Great Glasshouse at the National Botanic Garden of Wales



Inflorescence of *Banksia baueri* in the nursery house



The Ninfarium at Aberglasney Gardens cleverly combined architecture and exotic plants to create an otherworldly atmosphere



This apple tree had two whips grafted on several years ago in order to allow a bypass for the tree's vascular system which was disrupted by canker

In addition to relishing in the vast diversity of the National Botanic Garden's collections I also got the chance to make two excellent ventures out. Firstly, the head of glass Russell graciously offered to accompany me to Aberglasney Gardens nearby. Even in winter the gardens were quite beautiful and their unique glasshouse structure, the ninfarium, alone was well worth the visit. Showcasing a variety of tropical plants, the glass panels are built on and alongside the old ruins of the manor house creating a unique and otherworldly environment. At the end of my placement with the gardens I got the opportunity to visit a private estate home to over 700 apple trees to practice apple pruning. While there we were shown some really inspiring trees that displayed the philosophy of both gardener and owner, there were trees felled by wind that had been allowed to stay propped up on their branches and continue growing, some that had been affected by canker and saved through clever 'bypass grafts', and even a tree upon which 12 different leaders each of a different apple variety had been grafted. This willingness to accept damage to trees and turn it into something beautiful rather than simply removing and replacing them reminded me a lot of Japanese gardening philosophy and it was really refreshing and inspiring to see such methods applied to what is usually a very standardized and at times old-fashioned form of gardening. This same penchant for experimentation was displayed in what may be the crown jewel of the estate, a full hillside of *Malus sieversii* trees grown from seed gathered at the birthplace of the modern *Malus domestica* all the way in Kazakhstan. These trees are being left to grow mostly as they will as an experiment to see what comes of their fruit and as an amazing display of the long heritage of apple growing. With this incredible capstone I left Wales and headed onward to continue my placements, in February I will find myself at RHS Rosemoor, and I look forward to all the new experience this and the rest of time as the RHS Interchange Fellow will bring.

I'm incredibly thankful to the Garden Club of America and RHS for their generosity and investment into the next generation of horticulture in making this fellowship happen. I must also give my heartfelt thanks to all the horticulturists, researchers, and fellow plant-lovers who have so freely given their time, passion, and knowledge to me thus far. Lastly to Rowena Wilson who has repeatedly gone out of her way to assist me and ensure that I get the most possible out of my time here in the UK. Until next time you'll find me head still spinning in whatever glorious garden the program takes me to next!