



WELLESLEY COLLEGE

A Party to Connect People to Plants

On the evenings of February 11 and 12, the Wellesley College community welcomed back the tradition of an annual greenhouse Light Show after a hiatus of two years. First of its kind in the Global Flora conservatory, this year's Light Show was themed "Cultural Connections" to celebrate the diversity of plants in Global Flora and their cultural significance to people around the world.

Dressed by colorful theatrical lighting and spotlights, highlighted plants showcased characteristics that one might not otherwise notice during the day. Many were surprised to see, for example, that the foliage of Sensitive Plant (*Mimosa pudica*) closes at night to protect pollen and reduce water loss when the leaves are not photosynthesizing. From the Golden Barrel Cactus (*Echinocereus grusonii*), a rare species endemic to east-central Mexico where the flesh of the cactus is candied and eaten as a treat, to the Banyan (*Ficus benghalensis*), the national tree of India where the tree holds great symbolic, spiritual,

and religious significance, visitors traveled across continents as they walked from the Dry Biome to the Wet Biome. Conversations about plants filled the conservatory thanks to a group of plant-enthusiast volunteer docents who delivered lightning talks about the highlighted plants.

In sync with the dramatic visual effect of the dazzling lights whose reflections danced on the ceiling of Global Flora, musical performances by faculty and students turned the show into a symphony of both light and sound. The Fiddleheads, a student-run Celtic music ensemble, engaged crowds of visitors with their lively performance on the greenhouse mezzanine. With its enormous, curving fiddleheads growing toward the ceiling, the towering tree fern provided the perfect backdrop for the stage.

The multi-sensory experience captivated a diverse crowd of visitors. "I loved the light show!" Eva Paradiso '20 said. "The arrangement of the lights gave me a different view of the



Visitors enjoyed a Global Flora transformed by light and sound.

greenhouse and the plants within. I also enjoyed learning about different plants as I walked through the greenhouse. In particular, the docents were awesome!"

One of the goals of the Light Show is to invite the college community to Global Flora and remind people that an amazing collection of plants from around the world is here for them any time the conservatory is open. For some visitors, it might have been their first time in Global Flora, but definitely not their last. "I brought four of my friends," Eva Paradiso shared. "Three of them had never been to the greenhouse before. The Light Show was a great way to introduce them to this beautiful resource that we have on campus!"

by Yuxi Xia '20, Dorothy Thorndike Intern

Slipping Away to Global Flora

I recently went to the annual Amherst, Massachusetts Orchid Society show and was one of hundreds of people treated to an explosion of fantastical blossoms. With over 10,000 known species and even more artificial hybrids, any orchid show barely scratches the surface of this popular family.

Because of this worldwide fascination with orchids, certain species in the wild face collection pressure, illegal rustling, which can decimate wild populations to the point of extinction. Slipper orchids are among the most desirable and vulnerable.

The slipper orchids, a subfamily within the orchid family called the Cypripedioideae, is made up of 5 genera. *Paphiopedilum* (138 species) is found only in Asia; *Cypripedium* (58) in North America, Europe and Asia; *Phragmipedium* (29) in Central and South America; *Mexipedium*, a single species in Mexico; and *Selenipedium* (5) in Central and South America. Many Americans are familiar with slipper orchids having encountered species like the Pink Lady Slipper Orchid, *Cypripedium acaule*, in piney woods.

In compiling groupings of plants for the Global Flora conservatory, we sought species that highlight certain lessons of botany and horticulture. As “endangered species” is unfortunately a concept that is becoming more prevalent in biological disciplines, we decided to create a grouping of endangered terrestrial slipper orchids planted in an in-ground bed. Not only would they dazzle the casual visitor with their sublime flowers, but we could slip

in some educational text about rare and endangered species.

I knew that the United States Botanic Garden in Washington, D.C. had a diverse collection of these as they receive



Paphiopedilum haynaldianum

plants confiscated by the USDA as illegal shipments. After contacting William McLaughlin, the Curator of Plants, I traveled to D.C. to acquire whatever they could spare. I frankly was stunned by their generosity. Division after division filled my shopping cart and by the end of the day we amassed a spectacular collection of some of the rarest slipper orchids in existence. One donation, a division of *Mexipedium xerophyticum*, was particularly exciting and disappointing. Exciting, as I had never seen a live plant of this extremely rare species, and disappointing, as I had only seen photos of the flower and was surprised that the blooms were thumbnail size. Twenty-one donations were *Paphiopedilums* and as the majority of these species come from limestone substrate areas in the wild, we sought to recreate this in our construction of the bed. A mix of bark chips, marble chips, sphagnum peat and perlite was woven around old tufa rock, saved from the old greenhouses. The slipper orchid

species were planted within this, grouped by degree of endangeredness (as per IUCN rankings), from Threatened to Critically Endangered. All survived nicely and some began to flower immediately. We saved a few spots for species we will have to acquire from commercial sources such as the spectacular *Paphiopedilum sandermanum* and *P. rothschildianum* (a donation opportunity), but the willingness of the USBG to contribute to this educational planting is such a prime example of how botanic gardens strive to share and spread the crucial message of conservation.

Along with the slipper orchid we were given three other orchid species and divisions of 17 bromeliads which now grace the north wall of Global Flora. Seven other species, including the hard to come by Quinine, *Cinchona pubescens*, rounded out the day’s inventory. It was, as they say in the plant collecting field, a splendid haul.

by Rob Nicholson
Botanical Collections Manager

Slipper Orchids donated by the United States Botanic Garden and their IUCN rankings

Vulnerable:

Paphiopedilum hirsutissimum

Endangered:

Paphiopedilum armeniacum, *P. barbatum* var. *nigratum*, *P. glanuliferum*, *P. glaucophyllum*, *P. haynaldianum*, *P. insigne*, *P. lowii* var. *richardianum*, *P. malipoense*, *P. spicerianum*, *P. tonsum*

Critically Endangered:

Paphiopedilum exul, *P. henryanum*, *P. liemianum*, *P. primulinum* var. *purpurascens*, *P. victoria-mariae*, *P. victoria-regina*, *Mexipedium xerophyticum*

Going, Going, Gone

Botanic gardens have often been compared to Noah’s Ark, although this analogy is imprecise from both a genetic and biological standpoint. To truly conserve endangered species, botanic gardens need to move beyond single specimens. They would do well to mimic zoos, which carefully monitor genetics and mating lineages of rare creatures.

There are ranks of ‘endangeredness’, as constructed by the International Union for the Conservation of Nature, ranging from ‘Near Threatened’ to the dreaded ‘Extinct in the Wild’. The



Annalise Michaelson prunes one of our *Brighamia insignis*.

Wellesley College Botanic Gardens carries in its collection plants veering towards extinction, but also three species that are no longer to be found in the natural world.

Within Global Flora are two— *Euphorbia mayurnathanii* and *Brighamia insignis*. *E. mayurnathanii* was only found on one cliff face in Pallassana, Kerala, India and was first described

by Leon Croizat in 1940, based on material collected by P.V. Mayurnathan. Three very old trees were found on a rocky ledge. As this area received tropical monsoon rains and the *Euphorbia* were a xerophytic species, it was postulated that the area was once much drier and that “the poorness of its numbers is indubitable testimony to the unsuitability of the environment.” Since the initial collection by Mayurnathan, the species has gone extinct and a number of searches failed to locate any plants. The plant is narrowly in cultivation, and we acquired our cutting from the Atlanta Botanical Garden. It now grows in the Dry Biome, a pointed example of how climate change can render an organism extinct.

In the Wet Biome of Global Flora, we recently planted two *Brighamia insignis* received from the United States Botanic Garden. This Hawaiian species is known as Alula in Hawaiian, or Cabbage on a Stick due to its appearance. In 1994, about 50 plants were known, but the last known wild individual was seen in 2014. Growing on steep slopes and cliffs, the species was buffeted by hurricanes and landslides. Feral pigs and goats added to its problem set. *Brighamia insignis*, unlike the *Euphorbia*, has lovely yellow tubular flowers with a honeysuckle scent. As we have two individuals, we can hopefully cross-pollinate and produce more seedlings for other gardens and conservatories.

Our third Extinct in the Wild plant resides outdoors in the Arboretum— *Franklinia alatamaha*. John and William Bartram discovered the species in 1765 in a three-acre sandy bog of Georgia’s Altamaha River valley, and their cousin, Humphrey Marshall, named it after their close friend Benjamin Franklin. It was last seen in the wild a short 38 years later. Climate had little to do with the wild extinction of *Franklinia*; a surge in interest for the plant in London in the 1780s likely led to a mass removal from its small southern enclave. This deciduous shrub is in the same family as our *Camellia*, with sweet-smelling white-and-yellow flowers. It continues to survive in cultivation, where botanic gardens propagate it and catalog its finicky growing requirements.

Botanic gardens can’t save the entirety of the critically endangered members of the plant kingdom two by two, but the preservation of this material serves as a harrowing reminder of rapidly accelerating global biodiversity loss. Much like climate change, plant extinction can be caused by a combination of environmental and human-led factors which are frequently intertwined. Botanic gardens, then, have a crucial role to not just be conservatory-arks but distribution centers of both rare plant material and accessible education.

by Annalise Michaelson ’21, WCBG Curation Assistant
& Rob Nicholson, Botanical Collections Manager

Plant Health Team

Along with the new plants embedded in the new Global Flora conservatory came some visitors from the pest world along with our old ‘friends,’ the aphids, white flies and mealy bugs. How best to cope? And without insecticide, since the greenhouses have operated for years using integrated pest management (IPM) to control unwanted guests. Botanic Gardens Director Kristina Niovi Jones called in an IPM expert to help come up with a plan. He confirmed her assumption that plant health was improved when more eyes, especially experienced eyes, paid close attention to each individual plant leading to early detection of pests and easier treatment. So a student team was formed to help look after plants.

On a recent Monday morning, the weekly team meeting showed the plan in full force. The group is led by Kristina, and consists of Botanical Collections Manager Rob Nicholson, Senior Horticulturist Tony Antonucci and student interns on the Plant Health and Curation teams. There are a total of 14 paid interns this year with various assignments, many of them hands-on work with plants.

The meeting, fueled by bagels and cream cheese, kicked off with a general comment from Rob—students might find dry patches and trickier watering this week because he was in the process of digging peat into the soil in the wet biome to lower the pH to improve plants’ absorption of micro-nutrients. Connect with Tony or Rob for specific help.

Students then went around the table with plant observations that might be helpful to others. One student noted there was something fuzzy in the mangrove tank. She took a picture with her phone and uploaded it so it could be diagnosed. A weekend waterer commented on the warm temperatures and dry patches in the conservatory caused by the spring sun, starting a brief discussion of when to deploy the shades built in to the roof and whether to manually open some vents.



Emma Conrad-Rooney treats scale on a small palm.



Tony Antonucci explains to Emma how to brush scale insects off a plant.

The conversation then turned to the ferns that had been planted as ground cover in the wet biome. Should they be officially accessioned, that is, put into the IrisBG database? They are not now. Some ferns are happy and some are struggling, but which is which? They have not been given official green name tags like the specimen plants and their nursery name tags are well hidden in their foliage. There is a list of all ferns planted. If images were associated with the names then a useful fern identification sheet could be created—a new project! Finally Rob remarked on the tufa pots hanging on the north wall that fall off when the happy plants in them get too big and heavy. Should the fallen pots be replaced with felt instead of tufa?

What do the plant health team workers actually do? One of them, Emma Conrad-Rooney ’20, explains: “There are about half a dozen of us that work together to monitor the plants. We use an online spreadsheet to compile the data we collect. Over the course of a month, we try to monitor all of the plants in the greenhouse. So far, we have not officially assigned certain beds to certain students, but we tend to monitor beds that we’ve had experience working in. If I find a plant that, for example, has scale (like the *Euterpe edulis*) or aphids (like the *Gardenia tubifera*), I will mark in the spreadsheet that this plant “needs to be checked” and also describe what the problem might be. Then if there’s time, I may try to deal with the problem myself (e.g. using a toothbrush to brush off the scale or spraying soapy water onto the aphids). At the end of the day, I’ll type up a description of what I did that day and add all the plants that “need to be checked” to a “Needs Check” file, where more experienced staff will then go look at the plants. This notice gets sent to everyone on the Plant Health Team.”

With all this attention, the plants have a good chance to thrive and the interns know that their efforts are an important reason why.