The Gardener's Journal
Reynolda Gardens of Wake Forest University
Spring 2013

Photo Courtesy Reynolda House Museum of American Art Archives

One Hundred Years Under Glass

by **David Bare,** *RGWFU greenhouse manager*

This year marks the 100th anniversary of the Reynolda Gardens greenhouses and conservatory. The Lord and Burnham structure was originally constructed of cypress, iron, and glass. The range was constructed from a kit on the foundation of local rock that Mrs. Reynolds specified. In the 1960s, the cypress was replaced with aluminum in the working greenhouses, and that process continued in the conservatory in 1982. The original redwood slat shades were also replaced with aluminum at that point. Originally the greenhouse held a collection of palms, ferns, and orchids, the cherished plants of the day.

As far back as ancient Rome, people have been creating artificial environments to keep plants alive. Before the use of glass, sheets of translucent mica provided enough protection to produce cucumbers year round. Excavations at Pompeii unearthed a house with transparent walls, heated with flues, and outfitted with shelving to hold plants.

The advent of the conservatory can be traced directly to structures created to protect citrus. Called orangeries, these buildings had one glass side and were typically used as a temporary shelter for citrus housed outdoors in the summer months. The first orangeries dated to the mid-1500s and were open to the south with shutters that could be closed at night. Orangeries employed glass by the 1700s and became an emblem of status for the wealthy. In 1664 the prolific author, gardener, and diarist John Evelyn introduced the term conservatory to mean a place for conserving delicate plants in the winter.

The greenhouse and conservatory as we know it today, with glass roof and side walls, is largely a product of the drive to house new species being discovered in the tropics. Conservatories came into being when the technology to cast curved iron and the ability to produce glass in large sheets was developed so that curvilinear glass houses could be produced. The conservatory angled glass in a way that best positioned it for the optimal transference of light to plants. This was a significant change in the glass house as it became primarily a place for housing and growing plants, as opposed to an emblem of prestige.

In the first decades of the nineteenth century, the editor of *Famous Parks and Gardens* wrote that "a mania for conservatories spread contagiously among all the richer classes of the cold and temperate countries of Europe," writes Ruth Kassinger in her book *Paradise Under Glass.* Americans did not fulfill their tropical fantasies until much later. In 1855, Frederic Lord constructed a hothouse in Buffalo, New York. By the 1870s, he had acquired enough wealthy patrons to hire his son-in-law William

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Gardener's Journal

Flowers of the Sun

by **Michelle Hawks**,
RGWFU horticulturist

There is not another flower that can lift my spirits like a sunflower. They are bright and cheery and make you smile for no reason. Sunflowers are like our own rays of sunshine and just like us, they like to bask in its glow.

The amazing sunflower can be an annual or a perennial, but even as an annual it brings a long season of enjoyment. Throughout history the sunflower's beauty has been celebrated in paintings and poems. These flowers are full of many uses that make them even more desirable. There are single stem and branching varieties. The single stem has strong thick stems with one impressive bloom and is wonderful for cut flowers and arrangements. The branching varieties are my favorite because they produce numerous blooms over a long period of time. Another interesting fact about these plants is that a sunflower seed is not actually a seed at all. It is an achene, a one-seeded fruit, just like an acorn.

Sunflowers are also very appropriately named. All of the sunflower species belong to the genus *Helianthus*, which comes from the two Greek words, *helios*, meaning sun, and *anthos*, meaning flower.

History of the Amazing Sunflower

Archeologists have found evidence that indicates sunflowers originated in North America and were domesticated by the indigenous peoples around 3000 BC. In those times sunflower seeds were used for oil, flour, butter, and even a coffee-like drink. Dyes and paints were made from seed hulls, flower petals, and pollen.

The Spanish took the plant to Europe around 1500BC and its popularity quickly spread throughout the region. Sunflowers were once thought of as only a decorative flower. Peter the Great changed all that by developing the decorative sunflower into an agricultural product. In the late 1760s they started extracting oil from the seeds. It was at this time the people of Europe began to use the sunflower as a source of food.

Sunflowers are a group of plants with a variety of uses. Below is a list of some of the more interesting ones:

- The seeds, flowers, leaf, stem, and root all have uses.
- Sunflower seeds have a large amount of Vitamin E. Vitamin E has been shown to reduce the risk of colon cancer and has a significant anti-inflammatory effect on arthritis.
- Sunflowers seeds are high in magnesium.
- The seeds help in calming anxiety.
- Sunflower seeds have also been known to prevent migraine headaches.
- The stems of sunflowers have been used to make paper and clothing.
- The leaves have been used for teas.
- The flowers make yellow pigments used in paints and hair dye.
- The Native Americans would crush the roots to make dressings for wounds.
- The root has been used for snake and spider bites.

I am looking forward to growing a few new varieties of sunflowers this year here at Reynolda Gardens. Here are some varieties you can look for at the Gardens or that you could use in your own:

'Starburst Lemon Aura' is a beautiful single stem with double blooms which are a light buttery yellow. It will grow four to five feet tall and will definitely add some sunshine to your garden.

'Peach Passion' is a petite sunflower that would do well in a container or out in your garden. It grows three to four feet tall and is ideal for flower arrangements.

'Ring of Fire' has a bicolored petal that is dark red in the center and is golden yellow on the tips. This sunflower grows five to six feet tall. I am really excited about this one because I know it has the ability to stand out in the crowd.

'Moulin Rouge' is my favorite. I have grown this variety for the last couple of years. It has a rich, velvety, deep red flower that will steal the show in your garden. It will grow to five or six feet and will attract goldfinches.

My favorite part of working in the gardens is growing sunflowers. There are so many varieties and colors to choose from. They inspire me to continuously look at the beauty of nature and the complexity of every living thing.

A Little of Reynolda for Your Garden—St. John's Wort

by **Forrest Allred**, *RGWFU head horticulturist*

One of our responsibilities at Reynolda is to adhere to the original planting plans of Thomas Sears, the landscape architect who designed the Gardens. This requires replacing aging and diseased plants, as well as those that have died for one reason or another. This happens more often than you might think. For example, in the last year we have lost two *Hypericum patulum* 'Henryi', commonly called St. John's wort, in the Blue and Yellow Garden. They will be replanted this spring.

Why did they die? Hypericum natively grows along stream beds where water is moving or the soil has excellent drainage. We have noticed that water pools at the bottom of the teahouse stairs after significant rains, so poor drainage probably led to the death of these plants. But we can eliminate the problem by amending the soil. In a garden with so many plants, it's hard to believe that Thomas Sears' landscape plan called for only two *H. patulum* 'Henryi'. He also used only two *Viburnum carlisii*, Korean Spice Viburnum, (Spring, 2011) in the Pink and White Garden. Perhaps, it is because of the placement of the plants, framing the steps at each teahouse.

Botanical illustration of Hypericum perforatum from Flora von Deustschland Österreich und der Schweiz 1885.

Hypericum is a genus of 400 annuals, perennials, and shrubs found worldwide, with twenty-seven species native to North Carolina. One of these is *Hypericum buckleyi*, Blue Ridge St. John's wort, discovered by Reverend Moses Curtis while on sabbatical in 1830, in Franklin, North Carolina. Hypericum can have a slightly informal look and are woody by nature, which should be taken into consideration when designing your own garden. In the South, they are usually evergreen to semi-evergreen and grow in sun or partial shade. The plant is valued for its yellow flowers with orange anthers and blooms for the duration of the summer. The blooms are followed by berry-like capsules in the autumn. There are species suitable for almost any use—along borders, as hedges, in mass plantings, as groundcovers, and in woodland or rock gardens. This is a plant that has few enemies. Root rot and wilt are typically the only problems that Hypericum succumb to in our hot and humid climates. During a harsh winter, they may develop winter burn. Otherwise, no serious insect or disease problems occur.

The history of Hypericum cultivation has its roots in medicine. There are a number of varieties listed in the University of Michigan — Dearborn's Native American Ethnobotany database that have medicinal uses. The active component in all of these is hypericin, which today is derived from the leaves and flowers of *Hypericum perforatum*. It has been used to treat depression and certain nervous conditions. However, *H. perforatum*, commonly called Klamath weed or goat weed, can also be a problem plant. It is listed as an invasive by the University of Nevada and is poisonous if ingested in large quantities by grazing cattle, sheep, or horses.

Here are several very nice Hypericum that I like and encourage you to grow in your home garden:

H. patulum 'Henryi' — Even with the recent struggles we have had at Reynolda, this Hypericum is extremely sturdy. Mature size after ten years is four feet by four feet. The flowers are lemon yellow, two to two and half inches across. With new introductions, 'Henryi' is not as widely available.

H. 'Hidcote' — This is a compact shrub growing between two and four feet high and two feet wide. It is considered by many to have the best flowers. They are three inches wide; brilliant golden yellow; and have a slight fragrance.

H. 'Rowallance' — This variety easily grows up to six feet tall and one to three feet wide. The flowers are a deep golden yellow.

H. buckleyi 'Appalachian Sun' — This plant only reaches a height of ten inches with an eighteen inch spread. It has smaller leaves and flowers and a spreading root system. It makes a great groundcover.

Meadow Development

by **Preston Stockton,** *RGWFU manager*

In 2008, Wake Forest University's Sustainability Committee suggested that a portion of the former Golf Links at Reynolda Gardens, approximately sixteen acres in size, be converted from an open, mowed field to a managed meadow. The goals were to decrease the emissions generated by the use of mowing equipment, decrease storm water run-off, and provide an enriched habitat for wildlife. The proposed meadow would complement the variety of habitats already offered in the woods, wetlands, streams, and gardens of the 129-acre Reynolda Gardens preserve. In addition, it would provide an enhanced educational component to the Gardens for students of all ages.

In April of 2011, the Reynolda Gardens staff invited members of the Wake Forest University biology faculty, representatives from government agencies and land conservancies, citizen scientists, and the public to a roundtable discussion on the best way to develop the meadow. As a result of this meeting and additional discussions with Laura Fogo, a regional biologist with the U.S. Fish & Wildlife Service, it was determined that the first step in the process was to eradicate the existing fescue and Bermuda grasses. To assist with the development of the Meadow, the Gardens applied for and received a grant from the Partners for Fish and Wildlife Program in May of 2012. The goals of the program, which is part of the U.S. Fish & Wildlife Service, are to promote and implement habitat restoration that benefits federal trust species; provide conservation leadership and promote partnerships; and encourage public understanding and participation. Considering that ninety percent of the land in North Carolina is privately owned, working with landowners to protect habitats is crucial to the U.S. Fish & Wildlife Service. The grant funds site preparation, the purchase of seeds and plants, and educational signage, as well as providing technical assistance.

We completed the initial seeding of the meadow during the first week of March, using species of native grasses and wildflowers that reliably germinate from direct sowing. Those species are listed in the box at the end of this article.

Laura Fogo, U.S. Fish & Wildlife Service, and John Kiger, RGWFU staff, with seed drill.

The Gardens staff will start another forty-five species of wildflowers, types that are a little more difficult to propagate or are expensive, in the greenhouses this summer. The seedlings will be transplanted into the meadow in the fall. Plantings will continue indefinitely to achieve a high-biodiversity plant community and functioning ecosystem.

This is an exciting project on many levels. First, with the emphasis on native, Piedmont plants, the meadow will provide nutritious food, high quality nesting material, and shelter for resident and migratory birds, as well as other animals. Reynolda Gardens is on the North Carolina Birding Trail and is known for a high diversity of birds; but, hopefully, the development of the meadow will bring grassland birds back to our landscape. Additionally, the wildflowers will provide a nectar source and attract a variety of butterflies and pollinators.

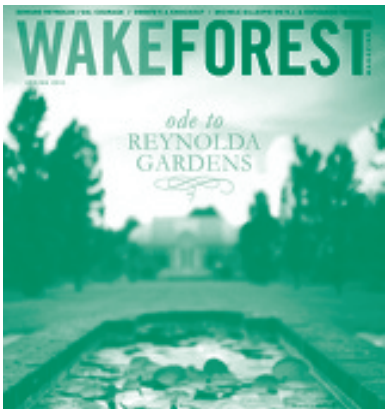
The project will also be an integral part of the educational and research mission of Reynolda Gardens and Wake Forest University. It will serve as an outdoor laboratory for the Reynolda Gardens Programs for Schools and as an educational resource for the general public. There are currently eight faculty members in the Biology Department at the University incorporating the meadow into core and upper-level courses, undergraduate research mentoring, and research projects. The Center for Energy, Environment, and Sustainability at Wake Forest has also actively partnered in this project, and the Center and the Environ-mental Studies Program will continue to use the meadow as a case study in sustainability in practice and education.

Reynolda Gardens would also like to thank our other partners participating in this project:

Audubon Society of Forsyth County
Carolina Butterfly Society, Triad Chapter
Forest Garden Club
Garden Club Council of Winston-Salem and Forsyth County
Little Greens Garden Club
Nature's Select Premium Turf Services, Inc.

Meadow Seeding Spring 2013

Native Grasses	
Andropogon gerardii	Big Bluestem
Elymus virginicus	Virginia Wildrye
Eragrostis spectabilis	Purple Lovegrass
Danthonia spicata	Poverty Oat Grass
Panicum virgatum	Switchgrass
Schizachyrium scoparium	Little Bluestem
Sorghastrum nutans	Indiangrass
Tridens flavus	Purpletop
Wildflowers	
Cassia fasciculata	Partridge Pea
Coreopsis lanceolata	Lance-leaved Coreopsis
Echinacea purpurea	Purple Coneflower
Ratibida piñata	Greyheaded Coneflower
Rudbeckia hirta	Black-eyed Susan



Ode to the Gardens!

Check out the recent Wake Forest University alumni magazine at http://magazine.wfu.edu/category/spring-2013/ to see a feature spread on the Gardens!

One Hundred Years Under Glass

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Burnham on as partner. The first major contract for Lord and Burnham was for a 12,000 square foot structure in San Francisco that is today known as the Conservatory of Flowers. Its parts were fabricated in New York and sailed to California. Other major contracts read like an inventory of the country's finest glasshouses: the Sonnenburg in upstate New York, the Phipps in Pittsburgh, the Enid A. Haupt Conservatory of The New York Botanic Garden, and the United States Botanic Garden in Washington, D.C.

Our little greenhouse does not begin to compare with these magnificent structures. But we are making the best of our resources. We regularly host school groups exploring the varied flora of tropical areas. They range from college to elementary age. We occasionally have a teen come in and tell us that the coleus cutting they potted up here in elementary school is still thriving. It is seldom that you hold the rapt attention of an entire school group, but there are always one or two students who are captivated by the structure and its plants.

Among the famous Lord and Burnham structures are the remains of the first curvilinear greenhouse produced in the United States, at Lyndhurst Estate on the Hudson River in Tarrytown, New York. Looking at photos of this behemoth structure, lacking a single pane of glass, one cannot help but draw parallels to reconstructed dinosaur skeletons in natural history museums. The metaphor is an obvious one. We are so fortunate to have our own 100 year old structure alive and thriving, housing a variety of plants, and hosting children and adults. It is a theater for education and enjoyment and refuge on a cold winter day.

Eagle Scouts Share Their Love of Reynolda

by **John Kiger,** *RGWFU assistant manager*

Just imagine sitting on a bench at the edge of Lake Katharine. Above you, a flock of mallards gracefully descends to land gently on the water. Off to your left, standing in a shallow pool, a great blue heron looks for his or her next meal. Relaxing on a bench while observing wildlife sounds like a very nice way to spend a warm afternoon, doesn't it? Now you can do just that. As you walk the asphalt drive from the Boathouse to the spillway of Lake Katharine, you may notice an addition to the landscape, thanks to Pierce Corpening. Pierce, a member of the Boy Scouts of America, is the son of Mr. and Mrs. Charles A. Corpening. Eager to secure a project for his Eagle Scout Award, Pierce approached Preston Stockton and me in the late spring of 2012 to discuss two great ideas. First, he wanted to build some benches wherever we thought was a suitable location. Second, he wanted to construct wood duck boxes that he would place in Lake Katharine. According to Audubon Society member Phil Dickinson, wood ducks, which are cavity nesters and readily take to nest boxes, have been observed in this area. Pierce's project was approved, and he moved forward.

The benches were placed northwest of the Boathouse on the lake's edge. Pierce planned, built, and successfully installed five wood duck boxes, complete with nesting and predator guards, in the marsh of Lake Katharine.

Pierce Corpening with duck box.

Obviously, this was no easy task. Two of the boxes can be seen either from the newly constructed benches or from the spillway. As for his learning experience, Pierce noted, "It was a time of challenge, achievement, leadership, and growth."

Clark Osborn and volunteers

This was not the only Eagle Scout project completed at Reynolda Gardens last year. Clark Osborn, son of Mr. and Mrs. Ernie Osborn, contacted Preston and me in January of 2012 to discuss his own Eagle Scout project. After a few meetings, we decided the project should focus on the original outdoor swimming pool area that is just off the nature trail. Clark wanted to "honor the historical significance of Reynolda," so his first step was to meet with Todd Crumley, the Director of Archives and Library at Reynolda House, to look at Thomas Sears' original planting plan for the pool area. Clark's greatest obstacle was locating the plant material, but he was determined, and it paid off. In reference to Thomas Sears' plan, Clark purchased and planted fifty-four various trees and shrubs around the pool area, in addition to ferns and daffodil bulbs. It was quite an undertaking. He led a group of thirty volunteer adults, Scouts, and children in building three benches, replacing deteriorating border logs, removing fallen tree limbs, raking and blowing leaves, and spreading four cubic yards of mulch. The volunteers worked approximately one hundred hours to complete this project.

Both of these young men did an outstanding job and obviously have a great fondness for Reynolda Gardens. Pierce said he is "enjoying hiking from my backyard over to the benches and observing the ducks. I encourage everyone to enjoy visiting Reynolda Gardens." While Pierce encourages all to visit, Clark touches on his own

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The Greenhouses Go Green

by **Amanda Lanier,** *RGWFU curator of education*

It only seems appropriate to mark the anniversary of the greenhouses and conservatory with a modern addition. Mr. and Mrs. Reynolds set out over a hundred years ago to use Reynolda Gardens as a model of self-sufficiency for local gardeners and, even more, for the community.

These values are similarly shared with the larger community of Wake Forest University, whose motto is "Pro Humanitate," which is translated as "for humanity." Ravish Paul, Energy Manager of the University, says his office is "always on the lookout for opportunities that benefit all." Therefore, the decision to put solar panels on the education wing at Reynolda Gardens was not just a small demonstration of solar energy potential for the University, but also an opportunity to "educate and encourage the community to invest in a living which is in harmony with nature," according to Paul.

In February, we installed an array of photovoltaic cells on the south-facing roof of the education wing. Photovoltaics use solar cells to convert sunlight into energy. When several cells are connected in a panel or array, the power generation capacity is increased. Once the energy is generated, it is sent to the inverter, which converts it into a usable form. The usable energy is then supplied to the utility company's electric meter to either slow it down or spin it in reverse. It is projected that these panels will offset ten percent of the greenhouses' energy usage each year.

Why solar? The Environment North Carolina Research and Policy Center found that our state has the potential to collect twice as much sunlight as Germany, the world's leader in solar energy production. Photovoltaics are a common sustainable energy source and, in terms of global importance, rank third, behind wind and hydropower, in providing renewable energy. At the end of 2012, one hundred countries worldwide were using photovoltaics.

In many international cases, photovoltaic usage has become more economically viable than traditional energy sources. For example, citizens in Cambodia can purchase a solar lantern at the equivalent of twenty-five U.S. dollars and use it for years without any additional cost, while fuel for a kerosene lantern runs around thirty U.S. dollars per year.

One of the most influential thinkers of our time, Lester Brown, founder of the World Watch Institute, had this to say about solar power, "The growth in the use of solar cells that convert sunlight into electricity can only be described as explosive, expanding by seventy-four percent in 2011. The world's current 70,000 megawatts of photovoltaic installations can, when operating at peak power, match the output of seventy nuclear power plants." Photovoltaics are not the only way to use the sun's energy. The pace of solar energy development is accelerating as the installation of rooftop solar water heaters takes off. Unlike solar photovoltaic panels that convert solar radiation into electricity, these solar thermal collectors use the sun's energy to heat water, space, or both.

With issues of poor air quality, the destruction of natural areas, and the possible degradation of our groundwater arising from the use of fossil fuels, it is our privilege and responsibility to explore energy production in renewable and healthy ways. I am reminded of a quote by Thomas Edison, "I'd put my money on the Sun, what a source of Power! I hope we don't have to wait until oil and coal run out, before we tackle that." We hope that the installation at Reynolda Gardens is a step towards a better understanding of solar power's place in the energy spectrum and a cleaner environment.

Since its inception, Reynolda has served as a model of natural innovation and education. Just as Mr. and Mrs. Reynolds used the Gardens to show others what could be done if given the means, we invite that same spirit in the work we do today. The greenhouses and conservatory, even after one hundred years, are an integral part of our mission. It is our vision that through our educational endeavors and our example we will inspire awareness and an improved understanding of our natural world.

Installation of Solar Panels

Gardener's Journal

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Communications about Gardens development should be addressed to Preston Stockton, manager. Correspondence concerning *The Gardener's Journal* should be addressed to Amanda Lanier, editor.

A calendar of events is published separately in January and August.

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Eagle Scouts Share Their Love of Reynolda

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special feelings for Reynolda Gardens, "Reynolda Gardens has always been special to me because my mom often took my brother, sister, and me for long walks through the fields, gardens, and around the lake on various trails. I remember playing in the woods, watching turtles sun themselves on logs, and occasionally seeing a snake slithering across the path. So when it was time for me to choose a place to do my Eagle Project, the first place I thought of was Reynolda Gardens."

My thanks to Pierce Corpening and Clark Osborn for a job well done!

Volunteers

Marge Asel
Sandra Belmont
Jacob Blackwell
Jacob Boyd
Lynda Bryant
Jean Dixon
Anne Dowell
Becky Faircloth
Tom & Julia Fredricks
Janet Frekko
Janet Hano
Rich Harris
Pat Jacques
Janet Joyner
Beverly Kiger
Cynthia Leonard
Tony Ma'luf
Peg Martin
Kay McKnight
Bev Moore
Anne Morehead
Patti Morrison
Mary Newman
Dina Nieuwenhuis
Jim Nottke
Susan Pfefferkorn
Vianne Piper
Dillon Robertson
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