

# Historic East Gardens Docent Team Manual

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# Historic East Gardens Docent Team Handbook and Logistics

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## **Welcome to the Historic East End Docent Team!**

**Your Role:** Docents are knowledgeable, enthusiastic people who act as liaisons between Longwood Gardens and our guests. As a volunteer docent, you will share behind the scenes information and your knowledge and love of Longwood. You play an important role connecting our guests' minds and hearts to Longwood through informal interactions sharing the interpretive messages you will learn. You help ensure our guests have an extraordinary guest experience every time they come to Longwood Gardens.

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## ***Longwood Gardens Mission Statement-***

*Longwood Gardens is the living legacy of Pierre S. du Pont, inspiring people through excellence in garden design, education, horticulture and the arts.*

Longwood owes most of its creation to Pierre du Pont. Pierre du Pont purchased the initial 202 acres in 1906 to save a significant collection of beautiful old trees and to create a country home to entertain his family and friends. Starting with a simple Flower Garden Path, he began the spectacular Longwood Gardens we know and enjoy today.

We continue Pierre S. du Pont's passion for excellence through innovation, creativity, experimentation and professional development. We strive to connect our guests with this living legacy.

You, as docents, are an integral part of sharing his legacy and story with our guests.

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## Communication

Nearly all docent communication, updates and important information will be communicated to you via email. Please be sure to check your email regularly so you don't miss anything important. There is also a section in the sign in book where updates will be placed.

Your feedback and suggestions are valuable to our team. Please communicate any questions, problems, comments or suggestions by contacting the staff coordinators listed below, by email, phone or stop in our office upstairs in the Peirce du Pont House. There is also a Notes section in the sign in book for leaving written messages.

## Staff Contact Information

Nancy Bowley  
[nbowley@longwoodgardens.org](mailto:nbowley@longwoodgardens.org)  
610-388-5263

Paula Butera- Kunkel  
[pbuterakunkel@longwoodgardens.org](mailto:pbuterakunkel@longwoodgardens.org)  
610-388-5354

You may also get emails from Sally Kutyla, volunteer coordinator,  
[skutyla@longwoodgardens.org](mailto:skutyla@longwoodgardens.org)

## Volunteer Shifts

Shifts: April – October: 10:00 -1:00 pm, 1:00 – 4:00pm 7 days a week  
Summer Evening Shifts: 4:00 – 7:00pm or 5:00 – 8:00 pm

Note: Generally two docents are needed per shift; however, additional docents will be very helpful especially during evenings and weekends.

It is best to fill all the shifts first and then additional docents may be added on any one shift.

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## Scheduling

Please use the online calendar to schedule your volunteer shifts. You are encouraged to select a regularly scheduled time slot. Please take your name off the calendar any time you need to cancel your shift. If you are unable to work your shift at the last minute due to an emergency, also please email Paula Kunkel at [pbuterakunkel@longwoodgardens.org](mailto:pbuterakunkel@longwoodgardens.org) or call 610-388-5354.

*Note: Sometimes the calendar is slow so just try a bit later and it should have self-corrected.*

### To view the calendar:

Logon to our Website: [www.longwoodgardens.org](http://www.longwoodgardens.org).

Click on JOBS AND VOLUNTEERING on the top bar.

Click on VOLUNTEERING OPPORTUNITIES in the left column.

Click on CALENDAR in the left column.

In the center of the screen, you will find:

“To add your name to the **Historic East Gardens Docent Team** Calendar, click “[here](#)”

*Note: you may also bookmark or save the direct link -*

<http://our.calendars.net/lwg/flowergarden12> You can add this as a link under favorites on your homepage. Be careful not to select another calendar such as “Flower Garden Walk Weekend Gardeners”

### To add your name to the schedule

Logon to the calendar using the instructions listed above.

Click on the date (the actual date #).

Click on CREATE and enter 3 pieces of information when adding your name to the calendar:

- Your first name and the initial of your last name should be entered into the field titled “Calendar Text”. Always create a new entry and don’t add your name to someone else’s entry.

- Choose the start time of your shift and choose AM or PM.

- Choose the end time of your shift and choose PM.

Click on SUBMIT in the lower left corner of the box.

Click on VIEW CALENDAR to see your entry on the Calendar.

### To Remove yourself from the schedule

Logon to the calendar using the instructions listed above.

Click on the date (the actual date #).

Click on the EDIT button next to your name

Click on the DELETE button at the bottom of the box

This should remove your name

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## **Time Commitment**

Regular volunteering helps you to be a better, more knowledgeable docent. As a member of this docent team, you have committed to volunteer regularly (average of twice per month) as a docent throughout the season. Historic East Gardens Docents must volunteer a minimum of 35 hours between March and October. Docents also commit to attending enrichment training sessions throughout the year. Training hours are counted separately from “docent on the floor” hours. Note: docents who do not volunteer on another team, must fulfill 50 hours as a HEG team member.

## **Working with Fellow Docents**

### **Starting and Ending Your Shift**

You should arrive early enough so you can put away your belongings, orient yourself to what is new and get to the East Gardens on schedule.

Please park in the Visitor Center. You may NOT park near the Peirce du Pont house or Restaurant. These spaces are very limited. Longwood tries to reduce as much vehicle traffic as possible in those areas.

### Arrival at the Break Room

The Break Room is on the lower level of the garage, behind the Peirce du Pont House. It shares the same location with the Uniform Shop. HEG docents share the Break Room with the Meadow Garden teams. Try to arrive at the Break Room ten minutes early for your shift to have time to get oriented, connect with your fellow docent and get to your location.

Discuss with your fellow docent where each of you will start your shift and when you would like to change locations. If you arrive before a fellow docent and want to get started, leave a note letting your partner know where you will be working so they can choose another location. Don't work next to each other but spread out so you can contact more guests.

### Sign In

The sign-in book will be on the table. Make sure to look for the Historic East Gardens Volunteer Team Sign-In Book.

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Please sign each time you come to volunteer. PLEASE PRINT your name on the sign-in sheet legibly so your hours can be credited and turned into volunteer coordinator Sally Kutyla at the end of each quarter.

## Supplies

Supplies will be stored in the metal file cabinet. The key for the cabinet is in a magnetic key holder, attached to the back of the cabinet on the left side.

- Half aprons and small back packs will be available for you to use to carry various small supplies, maps and laminated flipbooks.
  - Garden Maps - Please remember to always carry a map.
  - Family handouts
  - Laminated radio directions
  - Longwood Horticulture information forms and pencils
  - Laminated image flipbooks
- There will be an umbrella for your use when it is very warm and sunny out.
- Backup supplies of sunscreen and bug spray are available. These products can be found on top of the mini-refrigerator in the Break Room.

You may leave any coat or other personal possessions stored in the locked metal cabinet during your shift. Please leave any purse or valuable items hidden in your car. This room is used by others and is not locked so we stress that you do not leave any valuables in the break room.

Before you leave, please put any props or supplies neatly away.

## Be prepared

Review your notes and updates before coming in.

Be sure to read the 'Garden Highlights' on the website before your shift begins. Stroll through the area you will be working in to see what is in bloom, if the display has changed and what you can highlight to guests. Link:

<http://www.longwoodgardens.org/GardensWhatsinBloom.html>

Familiarize yourself with what is blooming and engage with the gardeners if you have any questions. Be considerate of their time.

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## Personal Rules and Procedures

### Attire

You represent Longwood Gardens so please dress appropriately, neatly and cleanly. Always wear your docent shirt and nametag. Dress for the weather accordingly. Summer attire can include sandals and shorts but they should be neat, clean and conservative.

### Cell phone use

Please do not use your cell phone to send or receive phone calls or texts while on duty. If you need to take an emergency call please step out of the public eye to take your call. Remember you are the face of Longwood and are “on stage” while working as a docent.

### Inclement Weather

This is a rain or shine position. Come prepared for the days’ weather with sunscreen, a hat, raincoat or warm jacket. If it is lightly raining then you should do your best to remain on duty as some guests will be persistent. In the case of severe weather or heavy downpours you may get an email advising you to stay home. If the weather is spotty during times of short heavy storms take cover in the Peirce du Pont House or nearest shelter until the storm passes.

### Water/meals

Please plan to take any meal before or after your shift. Volunteers do get a great discount at the Café. If you need a snack during your shift please go back to the Volunteer break room for a quick stop and eat your snack there. You may carry a water bottle with you but shouldn’t carry any other beverage.

## Restrooms and Miscellaneous Information

Restrooms are located near the Italian Water Gardens, behind the Open Air Theatre and at the Visitor Center and Restaurant. There are also water fountains behind the OAT and near the Peirce du Pont House.

Emergency AA and AAA batteries for guests are available at the guest Information desk in the Peirce du Pont House.

Lost and Found - Lost items can be left at the Peirce du Pont House welcome desk. They will be turned over to the Guest Services Associates Team or to Security Personnel who will take them to the Guest Center. Guests should be directed to check for lost items at the Information Desk in the Guests Center in the visitor center.

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## Garden Etiquette

If you see guests running, damaging plants, feeding wildlife or doing things that might cause harm to themselves or others gently try to redirect their behavior. **You are not responsible for discipline** but sometimes an attention break from that behavior or a comment made in a positive way can positively affect guest's behavior. Redirect negative behavior in a polite, friendly, firm but non aggressive manner – make your statements general, not personal, and avoid the use of negative words such as don't and "you". Use your interpretive skills to talk about the value of an old tree or beautiful plant, or change behavior by talking to guests and directing their attention to an interesting aspect of the Gardens.

Longwood employees including security staff and GSA (Guest Service Associates) will also be on duty and can be contacted via the radio (out of earshot of the guests) when you feel you need staff to step in.

### Examples to help gently change Behavior

#### Feeding Wildlife:

LWG would prefer for guests not to feed wildlife, but instead for the wildlife to eat what is in the natural diet. This way the wildlife does not become dependent on humans for survival. Plus, Longwood is like a salad bar for wildlife. Think about all the variety of plants and the berries many of them produce. As for fish, frogs and other water creatures, mosquitos are a great food source as well as algae.

#### Tree climbing:

That tree is a very old tree. Do you think it might hurt or not feel very good when guests climb its limbs? Think about how your own limbs feel after putting extra pressure on them. We hope the tree will survive for many many more years, and we need to take very good care of it so it will last. If you want to climb in the trees, check out one of our treehouses.

#### Flower picking:

If everyone decided to pick our beautiful display of flowers, there would be no flowers left for guests. Instead of picking the flowers, take photos. You will be able to appreciate the flowers for a longer period of time and it will bring back your memories of visiting Longwood Gardens.

#### Guests in the Fountains:

When you come upon guests in the fountains, you can kindly tell them that the fountain water is recycled and chlorinated and not the cleanest for splashing around in.



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You can suggest that the outdoor and indoor Children's Gardens have great fountains specifically designed for kids of all ages to get wet.

## Security Information and Emergency Situations

**No matter how minor or major a situation may appear, the first and only thing to do is to notify a staff person.** Staff will then take over.

- Do not administer first aid
- Contact the nearest staff member
- If you cannot find a staff member use the radio to contact the Guest Services Associate (GSA) staff on the GSERV channel; SECURITY on the radio, or 610-388-5222 on your cell phone

GSA staff - Your first contact in an emergency and they have basic first aid supplies. They enforce and encourage good garden etiquette  
GSA staff can be reached on the radio using channel "GSERV".

Security staff is the next level of emergency assistance for you. They are trained EMTs and can help in more serious situations. They can be reached on the SEC channel.

Gardeners can also serve as your emergency contact when needed to contact security.

The docent role is to try to comfort or calm the guest(s) until appropriate staff arrives. Any information you can collect from the guest is helpful, but please don't discuss such things as why or how the incident occurred or the frequency of similar incidents.

**If a guest is struggling to walk, or appears weak:** Help them to a seat if possible. Offer them the use of a wheelchair or scooter. Use the radio to call the GSA team for assistance as needed. They can bring you a wheelchair or (if available) a scooter for the individual. Note: there is a \$25 fee for using a scooter (free to members) and wheelchairs are free (out in the Gardens, \$4.00 at the Visitor Center).

**In a critical emergency** such as a heart attack please call 911 and then Security at 610-388-5222. Security will direct the emergency care to the correct location. Please save Security's number to your phone and also be aware that Security can be reached on the radio Security channel. If you have to call Security first tell them your name, then tell them your location and what the problem is.

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**If you witness a minor incident** (for example, a bumped head), politely offer to get assistance for the guest. If they refuse, discreetly contact security so we can document the incident and follow up as necessary. GSA staff can offer a bandage or icepack in a minor injury. Anything beyond that Security must handle. *No volunteers should provide first aid services to a guest.*

## **Missing persons**

**If you are told by Longwood staff (or hear over the radio) that a ‘Code Adam’ (which is a process to follow for lost person) is implemented**, the Docent’s role is to be the eyes of Longwood staff and look for the lost person within your area. If you find the missing guest, radio the Guest Services Associate (GSA) staff (radio channel GServ) or Security staff (radio Channel 1 – Sec) that they should come to your location.

## **If you are approached by a guest with a missing / lost persons situation**

Stay with the guest. Remain calm and reassure the guest that all will be resolved shortly. Contact the GSA staff by radio or phone and notify them of the situation. Once staff arrives, introduce them to the missing guest and then step out of the situation, letting Longwood Staff take over.

Security will respond immediately to the scene. Security staff is trained in basic first aid and will have a portable First Aid kit with all the essentials. If the injury requires more care, they will call an ambulance and have the guest taken to the nearest hospital or appropriate care facility. No matter what level of attention or care is provided, Security staff then complete a full report on the situation.

## **Radio Use**

Radios are stored in the locked metal cabinet. The key for the cabinet is in a magnetic key holder, attached to the back of the cabinet.

## **The radio is for emergency use only to contact Guest Services or Security.**

Keep your conversation calm, short and to the point. Do not use any guest names. You can contact GSA staff on “GSERV” and security staff on “SECURITY”

Using the radio:

1. Turn the radio on and adjust the volume by twisting the short knob on top of radio.
2. Twist the tall knob on top of radio to select your channel. The radio view window will show you which channel you are on. You should be on VIS SERV.
3. Press and hold the large flat button on the left side of the radio to speak.

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4. Identify yourself, your location and identify who you are calling.

Example "I am a volunteer at the Lookout Loft (no names are needed).

Lead GSA, do you copy?"

5. Release the flat button to get a reply.

6. Press and hold again and explain briefly why you are calling. Example: "I have a guest who has fallen". "I have a child who has lost his mother. "

7. Remember to release the button to hear a reply so you can provide more information.

## Your Resources and Guest Questions

Answer questions to the best of your knowledge and ability. If you do not know an answer to a question, it is OK to say so. "Hear-say" and "old stories" are not appropriate information to share with guests, since they cannot be substantiated and often times are not true! If guests have a question you cannot answer you can do one of several things:

- Politely ask a nearby gardener who may know the answer.
- They can submit any question via our website: [questions@longwoodgardens.org](mailto:questions@longwoodgardens.org)
- Encourage them to take a photo of a particular plant they may have a question about so they can include it in their email or "Google" the answer themselves on the computer.
- They can submit a Longwood Horticulture information form which will be available in the volunteer room. Please try to carry these forms with you in the apron. Leave completed forms in the Questions basket in the break room.

## Resources –

- Docent documents– review at home
- Garden Highlights – check our website under Gardens
- Heritage Exhibit in the Peirce du Pont House – excellent source for history questions
- Library – you may take books out of the Longwood library or browse there
- Blog - <http://longwoodgardens.wordpress.com/> great source of interesting stories
- Staff – staff are happy to help but be respectful of their time
- Website – [www.longwoodgardens.org](http://www.longwoodgardens.org) lots of information is found here

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## References for Guests and Docents

The Pennsylvania Horticultural Society has an information service:  
610-625-8250

The Delaware Center for Horticulture also has an information service:  
302-658-6262

To find your local extension agency, visit:  
<http://www.csrees.usda.gov/Extension/index.html>

Plant information web sites:  
Plant hardiness zones:  
<http://www.usna.usda.gov/Hardzone/ushzmap.html>

USDA plants data base:  
<http://plants.usda.gov/>

List of native plants in PA:  
<http://www.fhwa.dot.gov/environment/rdsduse/pa.htm>

Native plants in PA:  
<http://www.dcnr.state.pa.us/forestry/wildplant/native.aspx>

Invasive plants in PA:  
<http://www.dcnr.state.pa.us/forestry/wildplant/invasive.aspx>

Brandywine Conservancy, Environmental Management Center, protecting the natural resources of the Brandywine watershed:  
<http://www.brandywineconservancy.org/index2.html>

**Your role as an Interpretive Docent is vitally important.  
Thank you for participating in this Volunteer Program and  
representing Longwood Gardens  
to the thousands of guests with whom you will interact.**

# Elements of Interpretation

## What is Interpretation?

Simply defined: Interpretation connects minds and hearts to a place

A more in-depth explanation is that interpretation helps guests make emotional and intellectual (hearts and minds) connections to a resource – or in our case, Longwood Gardens. Interpretation is more than just you (the docent) talking, answering questions, or exchanging facts. It is an interactive sharing of experience and knowledge between the interpreter and the audience.

The goal of interpretation is to create a learning environment that changes or enhances a visitor's knowledge, attitude, and perception. This is accomplished by blending a strong, accurate understanding of the topics, a love for the resource, and a concern for the audience.

The three main elements of interpretation can be summarized as **ART**:

1. Knowledge of the **Audience**
2. Knowledge of the **Resource**
3. Interpretive **Techniques**

Each of these elements is discussed in the sections that follow.

## 1. Knowledge of the Audience

One of the key elements of successful interpretation is assessing and adapting to the audience. Guests vary greatly in age, geographic origin, knowledge level, perceptions, and expectations. They also vary in their desire for interactions with human interpreters. Some guests want to be left alone, preferring to quietly listen to your discussion or walk through the area. Others may have just a few questions while others may have numerous questions and enjoy the interaction.

Let guests dictate the degree to which you interact with them. Make them feel welcome, but do not overwhelm them. If guests seem to welcome interactions, you can try to assess their interest, capabilities, and knowledge level by asking a few questions about themselves and their interests. Do not overestimate the guests' knowledge nor underestimate their intelligence.

# Elements of Interpretation

## Who are our guests? Why do they visit us?

Your audience can be classified in several different ways. One way to look at the guests who come in our doors is to determine why they visit us.

Every guest enters with a set of expectations that can be categorized as falling within one or some combination of five major identity-based categories: Experience Seeker, Professional/ Hobbyist, Spiritual Pilgrim, Facilitator, or Explorer. Research shows that individuals not only choose to visit or not visit based upon these identity-based motivations, but it also shows that these motivations largely determine how guests conduct their visit and strongly influences long-term learning and sense of satisfaction with a visit. © 2007 Association of Zoos and Aquarium

These are the **five distinct categories of guests** and their primary motivation for choosing to visit:

**“Experience Seekers”** primarily derive satisfaction from the fact of visiting this important site. They may have the least advance knowledge and the lowest expectations for their visit. They may want a picture memory and may not spend a lot of time visiting but head on to the next experience.

Example: A tourist-type that wants to briefly see, set foot in, and photo document that they were at Longwood Gardens so they can share their travel experiences. They are looking for the simplest of experiences and will excitedly share their discovery of “treasures” at Longwood with others. You should offer to take their photo!

**“Explorers”** are curiosity-driven and seek to learn more about whatever they might encounter at the institution. They are looking for a deeper connection and come with a good base of knowledge.

Example: These are guests that want to understand how Longwood works, its history, and the “hidden” or behind-the-scenes side of the operation. They will readily attend a talk or tour and will want to actively ask you questions.

**“Facilitators”** are focused primarily on enabling the experience and learning of others in their accompanying social group.

Example: Grandparents with grandchildren or parents with children are a fine example. The Grandparents or parents will most likely have a wonderful past experience or memory of Longwood Gardens and want to facilitate a similar

# Elements of Interpretation

experience in the children. You should talk with the adults, ask them questions and provide helpful suggestions on where or how they might forge these emotional connections.

**“Professional/Hobbyists”** seek a close tie between the institution’s content and their professional or hobbyist passions.

Example: The guest who grows an orchid at home, or has a waterlily garden, or breeds daylilies. In other words, these are guests that identify and directly connect with some part of Longwood Gardens. They want to understand how Longwood cares for the particular resource and compare this to their own care at home, in the hopes of becoming more proficient with the resource.

**“Solace Seekers”** are primarily seeking a contemplative and/or restorative experience. They may wish to be left alone to experience Longwood in their own way.

Example: This is the guest who may sit on a bench and be transfixed by the beauty around them, or very slowly stroll through the Conservatory gently brushing plants and deeply inhaling the wonderful scents. They are in their own emotional world. Eye contact and a smile is all you need to provide, letting this guest know you are available for conversation if they so wish.

**What type of guest are you?**

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## **Special Groups of Guests - families, tour groups and foreign language speakers**

Some special groups of guests are families, teenagers, tour groups and foreign speaking adults. Families can be broken down into two groups: families with children under five, and families with school-age children. Here are some tips for interacting with these types of guests.

- **Families with children under five** – in general, they spend less time in any one place due to the short attention spans of their young children. Keep this in mind when interpreting with them. Quick observations of any plant or garden element are very interesting to this group. Point out colors or unique smells and ask the family what they think might be going on. Young children will also welcome an

# Elements of Interpretation

opportunity to touch and examine objects. They are experiential learners and touching an object intrigues this group.

- **Families with school-age children** – should be encouraged to work together and discuss possible answers amongst themselves. Gardening techniques and composting concepts are usually a big hit with this group. Also, try to find ways for the family to work together and share their awe and discoveries. Remember that children often like to be challenged, to brainstorm ideas, and make discoveries. They rarely like to be quizzed!
- **Teenagers** – in general, like to travel in peer groups. If you are not used to being around or working with teenagers, you may feel a bit uncomfortable interacting with them. The only way to get to know this group better is to just start talking to them. They like to be treated as adults, not kids, so ask higher-level questions that will force them to think. This age group is fascinated with bizarre and unusual facts but try to lead the conversation back to points about gardening techniques, display, or heritage. Though certainly an interpretive challenge, working with teenagers can be a very rewarding experience.
- **Groups** – aside from general guests, interpreters will encounter a number of organized groups, such as school groups, tour groups, and senior citizen groups. Visits by school groups are frequent on weekdays during the school year. These and other groups vary widely in age, purpose, and expectations. As an interpreter, be sensitive to the group dynamic and aware that group members may often be pre-occupied interacting with one another as well as with you. Use the teacher, or chaperone as your aide if the group is largely composed of children. Adults can encourage proper group behavior and can repeat and emphasize important information to younger children.
- **Foreign language speakers** – don't assume that everyone who looks foreign only speaks a foreign language. Take cues from the language they are speaking and how they interact with your first greeting. Often if they truly don't speak much English they will tell you or nod their head no. See if there is a leader of the group who is acting as translator. Slow your conversation and simplify it to fit their comprehension. Even those who speak no English may appreciate an offer to take their picture or touch an object. Just mime clicking a camera and ask photo? And they may say yes. Or hold out the object for them to take and feel.



# Elements of Interpretation

## 2. Knowledge of Resources

Docents at Longwood Gardens are expected to develop and share their knowledge about the history, horticulture practices, plants, and unique elements associated with the various gardens. Knowledge of Longwood Gardens is based on specialized training, experience, personal background, and education.

You should develop your knowledge to a point where you can offer layers of interpretive information – from the basic “what” and “how” to an explanation of the “why.” You will want to tailor your information to your audience.

It is important to mentally prepare for an interpretative shift. Review your notes and manual and consider the direction your interpretation will take. Which area would you like to focus on? Select one or two. When sharing a hands-on object, try to connect it to broader themes such as heritage, garden display and design, or horticulture techniques that may be of interest to your audience. Preparation keeps conversations and group interactions lively and positive and gives interpretive objects more meaning.

Interpreters should develop a professional attitude about their volunteer work and have a respect for accuracy. Learn the information and facts and don't be afraid to say, "I don't know," to a question beyond your knowledge. Guests will appreciate an honest, “I don't know,” over a guess. Make sure to try to find out the answer that will allow you to provide the information the next time you are asked.

Choose your sources of information with care. Books in Longwood's library are accurate and up-to-date, but some sources on the internet may not be correct. Longwood Gardens staff members are an excellent source of information. However, the expertise of individual staff members does not extend to all topics. Other volunteers may also be an excellent source of information. Ask around. Read a little. And then share what you learn with your staff supervisors and your fellow volunteers. Obtaining good, current information can be one of the challenges of volunteering.

During docent trainings, staff provides information and in-service training about the displays as well as regarding the topics and issues surrounding specific areas or gardens. Docent trainings are a great place to extend your Knowledge of the Resource, receive updates about Longwood Gardens, and get to know your fellow volunteers and staff.

# Elements of Interpretation

## Resources

- Docent trainings
- Docent Manual
- Map and Guide – way finding, events and current activities
- Staff – staff are happy to help but be respectful of their time and if they are in the midst of a job or meeting
- Garden Highlights – available on the website
- Library – you may take books out of the library or browse there
- Website – [www.longwoodgardens.org](http://www.longwoodgardens.org) lots of information is found here
- Blog - <http://longwoodgardens.wordpress.com/> great source of interesting stories
- Peirce du Pont House Information Desk – current events
- Heritage Exhibit in the Peirce–du Pont House – excellent source for history questions
- Take time to walk the Gardens and look at the plants and locations you have read about.
- Daily talks and tours led by staff and experienced volunteers throughout the gardens are a wealth of information.

## 3. Interpretive Techniques

Interpretive techniques are the different ways we share our knowledge with our guests. Conversation is the primary interpretive technique used by volunteers and allows personalized interaction with guests. Interpreters should utilize several interpretive approaches, such as asking guests questions, encouraging close observation of the garden elements, and sharing hands-on objects.

### Techniques

**Roving interpretation**

**Interpretive Conversation**

**Use of Objects and Props**

Each of these elements is discussed in the sections that follow.

# Elements of Interpretation

## Roving Interpretation

As members of the docent interpretive team you engage in informal interpretation. Your opportunities for interaction with guests are spontaneous and can occur anywhere in the space you are working in..

Roving interpreters move throughout the area they volunteer in talking to guests, highlighting interesting parts of our displays and sharing behind the scenes information. Their role is to spark the visitor's curiosity and help them to interpret what they see. It is a give and take flow of communication which is a positive learning experience for both guests and docent. When done well, this personal interaction between guest and docent leads to deeper connections between the guest and Longwood.

A volunteer at a desk or cart has interested guests come to them. But, many guests are hesitant to take that first step and may never walk up to a cart. A roving docent can connect with many more guests on a more casual level. They can engage the guest in an impromptu manner and interpret what the guest is looking at or something nearby which is worthwhile to share with the guest. A larger part of our displays can then serve as interpretive discussion points.

For the docent this means interpreting "on the fly" and engaging the guest with what they are looking at. Just as a guest may be hesitant to come to you, some volunteers hesitate to walk up to a guest to start talking.

Let's break it down into simple steps to make this less challenging.

1. **Identifying a likely guest** to engage is the first step.
2. Use **positive body language** and a warm initial opening comment to connect with them and determine their interest level.
3. **Fit your conversation to the guest's interest level.**

Each of these elements is discussed in the sections that follow.

### 1. Identifying a Likely guest

When walking through an area, be aware of all the guests. If you see a guest who looks quite interested in something, lingers over a display or plant, looks wonderingly around them or you overhear a "How do they do that?" or "Wow! Look at that!" then you have the potential to increase their enjoyment of that moment. Engage them with eye contact, a warm smile and a simple greeting.

# Elements of Interpretation

Ask them if they have any questions. Introduce yourself. Our guests are generally happy to be here and pleased to be greeted with a warm smile. When you walk up to the side of an interested group, for example at the Organ viewing windows, take a moment for them to realize you are there. Then engage them in a similar manner. Never interrupt a conversation, just wait for a break before speaking up.

## 2. Determining the Interest Level of a guest

Every visitor responds differently to a roving docent. Some love the interaction and enjoy learning something new. They may even desire an extended interaction. Others prefer to enjoy the displays on their own.

Docents can learn a few simple skills to quickly assess the interest level of the guest and adapt their interaction for each guest.

Use your eyes to assess visual clues such as body language and eye contact.

A short reply to your warm welcome or greeting may indicate that they aren't interested. If a guest is glancing at their watch it's a tip that they won't have time for an interaction. Their eye contact or lack of it is one signal that they would prefer to be left alone. Then simply continue your walk or wish them a great visit and leave them to enjoy on their own.

On the other hand they may not have a question but sometimes a good question on your part can lead to good questions from the guest as you spark their interest. Questions are a great way to connect with guests. They can be used to assess a guest's interest or past experiences with Longwood Gardens or gardening. You never know if a guest is a casual visitor, musician, a garden pass holder or the director of the New York Botanical Garden. Your interaction with guests will be based on what experiences they bring to Longwood.

## 3. Fitting the conversation to the guests' needs

Be mindful that many guests have limited time to spend in any one space. Most of the time your connection will be short, engaging and over! Wish them a wonderful visit or help them find another highlight of Longwood before thanking them for visiting.

Some guests will really engage with you and you will have a longer interaction with them. Just take your cue from the guests. Remember to also be aware of other guests around you. They may be following your conversation and want to join in. Do you

# Elements of Interpretation

remember the old idiom ‘Eyes In the back of your head’? It usually applied to your mother, a teacher or someone else who always knew what was going on behind them. That’s a good skill for a docent to develop!

## Interpretive Conversation

Great personal communication is made up of three important elements: **words, voice, and body signals.**

*Research indicates that only seven percent of our verbal message is communicated through words; 23 percent of our message is communicated through voice; and amazingly, body signals account for 70 percent of our message!*

- **Words** - Effective communication involves choosing appropriate words. Words can make a person feel great or terrible, and can make a huge difference in shaping the attitudes of your audience. Choose words carefully. Consider the difference between telling someone they are “wrong” versus saying “Actually, a lot of people think that but ...,” or the difference between describing a gardening task like weeding as, “grunt work,” versus, “An effort that results in a beautiful display...”
- **Voice** - This is a vital tool in spoken personal communication. A lower pitched voice is generally more effective in interpretation. However, the volume of your voice should be loud enough for guests to hear you clearly. Speak with enthusiasm and vary the tone of your voice and avoid speaking too slowly or too quickly. Speak clearly without slurring or mumbling.
- **Body signals** - these are important nonverbal cues that are part of the communication repertoire. They include:

**facial expressions** - for example, lowered eyebrows convey anger whereas a smile and raised eyebrows express enthusiasm

**gestures** - too many can be distracting but a few for emphasis are effective

**posture** - it reveals what you think of yourself and of your listener. For example, slouching conveys indifference to the world, crossed arms places a barrier between you and the guests. Try for the happy medium of poised and comfortably relaxed.

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**eye contact** - thought by some to be the **most important body signal** Eye contact shows your audiences that you are interested in them and helps you gauge their interest level. Maintain eye contact throughout the group without focusing on just one person.

Much of docent interpretation is conducted through conversation. This lets the visitor lead the way but allows the personal style of the interpreter to shine. It is an informal exchange of ideas between two or more people. Even an informal conversation should have a beginning, middle, and end, or, in other words, introduction, content, and conclusion. This section discusses these elements.

## The Introduction/Conversation starters

It is often up to the interpreter to initiate the conversation:

- Simply greet the guests. A warm, "Hi! Welcome to Longwood Gardens!" may open the way to conversations and interactions. A non-spoken nod or smile may have the same effect. Once guests realize they can talk with you, they usually will.
- Open with a question. This is perhaps the best conversation starter of all; for example, "Can you figure out how gardeners water all the plants in the Conservatory?" Questions are excellent tools for initiating conversations because they ask the other person to respond. There are several levels of questions; from simple yes or no questions to higher levels of open-ended, valuing, and feeling questions. Questions also help you "read" your audience to determine at which level to aim your conversations and what their interests are. By asking someone what they know about Longwood Gardens will help you determine what interests them and what to talk about.
- Share an interpretive object or prop. Most people are interested in taking a closer look at an object like a flower or hanging basket display. This experience can easily lead into a conversation. Objects also provide physical information to guests. They can smell the wonderful scent of a flower, or see how a hanging basket is made.
- Try a self-disclosing statement such as, "I love to just sit in the Gardens. It's so relaxing." This is a way to equal out roles. Someone who is viewed as an "expert" may intimidate guests.

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- Try a positive, personal statement like, "Great T-shirt!" This type of compliment makes the visitor feel special and recognized. It can often lead into a conversation because, like the greeting, an opportunity has been created.
- Listen for a visitor's comment that might provide you an entry into a conversation. If you approach them in an unassuming, unobtrusive manner, most guests will welcome an answer to the questions asked amongst themselves. "Excuse me, but I overheard you wondering how old the fountains are ..." guests who are having difficulty with a display, appear confused, or perhaps are just having trouble locating something on the map, will definitely welcome your input!

## The Body of the conversation

This is your time to share information. Try to incorporate various interpretive techniques to keep the information exciting for yourself and your audience. **Don't reveal all the answers right away.** Get your audience to examine objects, make observations, and ask questions themselves. Having guests discover information for themselves will greatly enhance the impact of your interactions.

The middle of a conversation involves two activities, **talking AND listening.** You and the guests should share these activities equally or the conversation may end quickly. For example, if one person does all the talking, the other person may feel he/she is being lectured to; or if one person only listens and doesn't join in, the other participant may believe there is a lack of interest. **Try not to do all the talking, and ask questions to keep your audience involved.**

Remember to use the all-important **pause** in your conversation. It can signal the end of a thought, give an idea time to sink in, and also provide impact to a statement.

**Tap their emotions.** Explore the emotions and opinions of the audience. "Do you find the Conservatory beautiful or elegant?" Emotions and attitudes shape our perceptions and by helping guests understand this, we can positively influence them.

## The conclusion/ Ending the engagement

Endings provide closure to an interpretive encounter. The best endings encourage guests to see another display, like the Italian Water Gardens, or areas that build on the topic or interest of the visitor. Another simple method to ending a conversation might be, "I, hope you enjoy the rest of your day at the Longwood Gardens" or "Please come

# Elements of Interpretation

back again for a future display”. Let people know that you enjoyed conversing with them and leave them hoping for more interpretive encounters along the way.

## Using Objects or Props

Often you will have a lot of “tools” or props to help you tell your stories. Objects can have a power greater than words. They can make the story more concrete. Guests can touch and feel what you are talking about. They can also help engage guests in interesting dialog. For example, it is much easier to show how gardeners efficiently water the plants in the Conservatory by revealing the hoses contained in the floor. Finally, many guests may find their Longwood Gardens experience more memorable if they had the opportunity to touch or closely examine plant or item not typically accessible to the public.

When a cart is part of your interpretative location use the objects on the cart to engage our guests. They can passively look at and touch them if you happen to be away from the cart but it is much more meaningful if you explain, and create connections for them between the object, Longwood and them. Don't hesitate to carry some props with you when roving.

Here are some tips for object use:

- **Stimulate different senses with objects.** Most of the objects used are intended for guests to touch or smell or scrutinize closely. Encourage them to use different senses while examining these objects, “Can you see the column on this orchid?” The visitor who handles objects will have a better understanding of textures or structures that help the plant or display. Remember to take a break from speaking when giving your audience a chance to observe and handle objects.
- **Relate objects to various elements in the display.** Connect the props to the display. This makes the prop and display more fascinating. Use them to point out unique features or display elements. Be sure that guests can see both object and your connecting point of interest. “Here is a clump of dried moss. Can you see how this is used to line the hanging baskets?”
- **Use objects to elaborate on a theme.** Use any of the objects as the basis for a discussion or conversation. There are multiple directions this conversation can take – gardening techniques, heritage, and display. Objects should support a cohesive theme or idea, rather than act merely as eye-catchers.



# Elements of Interpretation

## A Variety of Interpretive Approaches

Learning is a complex process and people learn in many different ways. Because of this, interpreters need to be creative and incorporate a variety of approaches into the body of the conversation. Listed below are examples of different approaches that you can use in your interpretive repertoire.

- **Tap the five senses.** Encourage guests to experience textures and smells as well as things they can see. “Can you smell the light fragrance in the Acacia Passage?” Or, point out the push-cart tracks imbedded in the pathways of the West Conservatory, helping guests understand the heritage and history of Longwood Gardens and its horticulture practices. Guests may gain an appreciation for what they at first thought was just an old track.
- **Share an anecdote or story.** Kept short, a personal, positive, and relevant story can be an entertaining and effective way to convey information. As you volunteer, you will have many unique experiences that can be used as interpretive anecdotes.
- **Encourage your audience to work together.** See if they can work together to answer a question about why the whispering bench actually works for example. Or, you might ask a family to look at the pools at the Italian Water Garden and see if they can note the optical illusion. Encourage them to walk along the side of the IWG and see the difference for themselves. If they’re having trouble, give them hints.
- **Discovery** guests find information meaningful if they discover it themselves. Ask guests if they can see any difference between a Palm and a Cycad in the Palm House. Ask them to point out the various features that allow air circulation or trap heat and humidity.
- **Use gestures** Interpretation should involve movement other than with the mouth (talking)! Use gestures to make your point. For example, use your hands to demonstrate proper pruning techniques and tool use.

# Elements of Interpretation

A few last points –

## **Share a sense of wonder**

Wow your guests with

- A good story
- Neat facts about amazing, unusual, surprising, wondrous or shocking things
- Cool technical information shared in an easy to understand manner using simple language and easy to understand metaphors

What they could care less about

- Lots of numbers and lists of facts  
Did you know that quoting numbers turns on the analytical part of the brain and turn off the creative side of your brain?
- Longwinded stories

**Remember we don't have to share all our great stories at once.** Let the visitor lead the way; ask them questions and let them answer, and give them the opportunity to ask for more! Inspire wonder and curiosity and hopefully they will be back again!

# Elements of Interpretation

## How to be a Great Docent

1. Be enthusiastic- your passion for Longwood can inspire your guests
2. Know your stuff – study your notes before you come in. The more you know about the topic, the more your confidence will grow.
3. Know when to say I don't know. Do your best to find an answer but remember, unanswered questions can be a positive way to lead guests toward further inquiry and research.
4. Know your audience – tailor your comments to the guest's interest and background
5. Know the art of asking good questions.....and waiting for an answer!
6. Be a good listener
7. Use your props
8. Be confident– smile and make eye contact
9. Take pride in what you do and the important role you play.
10. Send guests on their way with smiles – on your face and theirs and encourage guests to enjoy other parts of Longwood.

# Elements of Interpretation

## Tips of the trade from your fellow docents.....

- ✓ ***“Leave your junk at home”*** – Many of you have expressed the idea that volunteering is a get away from our daily stress. Carry that thought a little further and remember that this is a getaway for our guests too. Make sure that your interaction with guests is always a positive one whether talking about Longwood Gardens, staff or what a guest shares with you helps you and them get away from it all and have a really positive experience.
- ✓ Review your materials the morning or night before you will volunteer. It certainly gives you a knowledge comfort level which is very helpful.
- ✓ Use the Scoop to review what is up and coming in the next week’s schedule.
- ✓ Don’t stay in one place. Check out the entire conservatory first and engage in conversation along the way. Find out what has changed since your last visit.
- ✓ Put notes you want to use that day into a folder instead of carrying around your large binder. The complete binder is always on the cart if you need it.
- ✓ A “smile”, “hello”, “good morning” is your first step in creating an interpretive opportunity. You can tell immediately if a guest wants to engage in conversation. Sometimes the conversation isn’t about the plants but about their attire or where they are from or if this is their first visit to Longwood.
- ✓ Get children involved – get physically down to their level and ask a question –have them use a prop – for example, use the wooden flue to create sound.
- ✓ So many times the person taking photos doesn’t get in the photos. Always ask, “Would you like me to take your picture?” You will put a big smile over their face allowing them to appear in a photo taken at beautiful Longwood Gardens.
- ✓ Don’t worry if you are unable to answer every question, most guests are just happy that you are interacting with them. You can always ask a gardener or consult your notes and catch up with the guest later, or take down their name and we will email the answer.
- ✓ Walking through Longwood Gardens I find that a big smile and eye contact does indeed introduce me to many wonderful guests. Even if all we exchange is that smile and “Good Morning” I am the better for it and I think they are too.

# Longwood's East Gardens Highlights

## General Longwood Garden Facts

Longwood Gardens is one of the great gardens of the world. We strive for innovation in horticulture and display. We present the arts in an unparalleled setting to bring pleasure and inspire the imagination of our guests. We contribute to society through excellent and diverse education programs, horticulture research, environmental stewardship, and cultural and community engagement.

Longwood Gardens encompasses 1077 acres; over 300 acres are open to the public. Pierre du Pont's original purchase from the Peirce family in 1906 included 202 acres. Other properties were added later.

## Early History

Many generations helped create Longwood Gardens, but one individual—Pierre S. du Pont (1870-1954), industrialist, conservationist, farmer, designer, impresario, and philanthropist—made the most enduring contribution.

Pierre du Pont was the great-grandson of Eleuthère Irénée du Pont (1771-1834), who arrived from France in 1800 and founded the E. I. du Pont de Nemours and Company gunpowder works. Pierre turned the family business into a corporate empire in the early 20th century and used his resulting fortune to develop the Longwood property.

More than 200 years earlier, the land had been inhabited by the native Lenni Lenape tribe who hunted, fished, and farmed the productive wilderness. In 1700, a Quaker family named Peirce purchased the property from William Penn and soon established a working farm. Joshua and Samuel Peirce began planting an arboretum on the farm in 1798. By 1850, the site was known as one of the finest collections of trees in the nation. Eventually the farm fell into disrepair.

In 1906, at the age of 36 Pierre du Pont purchased the farm in order to save the trees. Pierre inherited a strong sense of entrepreneurship, love of horticulture and the drive to leave a personal legacy; traits that reflected his family's philosophies. Soon, Pierre was dedicating great amounts of his personal fortune to transform his property and took great pride in delighting guests with its' growing beauty.

He followed no grand plan; rather, he built the gardens piecemeal, beginning with the 600-foot-long Flower Garden Walk in 1907. Although his later gardens would draw heavily on Italian and French forms, this early effort reflected what he termed an "old-fashioned" influence, with nostalgic cottage-garden flowers, exuberant shrubs, rose-laden trellises, and even a shiny gazing ball. The scale was grand, the accessories quaint.

Five years later was the debut of the new Open Air Theatre. His inspiration was an outdoor theatre at the Villa Gori, near Siena, Italy, although his version was much larger. Within a year, he equipped it with secret fountains that shot out of the stage floor to drench visiting nieces and nephews.

# Longwood's East Gardens Highlights

Pierre enhanced the domestic comforts of Longwood by enlarging the original Peirce farm house, notably in 1914 when he doubled its size. The attached conservatory was Longwood's first "winter garden" and Pierre's first experience with the aesthetics of greenhouse gardening.

The massive Conservatory opened in 1921. It would be hard to imagine a more theatrical setting for the indoor display of plants.

With the Conservatory a reality, Pierre turned his attention to another great love—fountains. He based his Italian Water Garden on the Villa Gamberaia near Florence, but he added 600 jets of recirculating water. At the Open Air Theatre, he replaced the old waterworks with 750 illuminated jets. His hydraulic masterpiece was the Main Fountain Garden in front of the Conservatory: 10,000 gallons a minute shot as high as 130 feet and illuminated in every imaginable color.

As early as 1914 with the formation of Longwood, Inc., Pierre was thinking about the eventual fate of the property after his death. In 1937 the Longwood Foundation was created to handle his charitable giving. When Pierre died in 1954 at the age of 84, he left Longwood with a well-established horticultural tradition, experienced businessmen (his nephews) as trustees, and a sizeable endowment.

After his death in 1954 Longwood's first director was hired. Since that time Longwood Gardens has matured into a magnificent horticultural showplace filled with countless opportunities for enjoyment and learning.

# Longwood's East Gardens Highlights

## **The Longwood Foundation**

In 1937 Pierre du Pont created the Longwood Foundation to manage his charitable giving.

The foundation was split in two in 1970 becoming two foundations – Longwood Gardens, Inc. and the Longwood Foundation. Longwood Gardens, Inc. is the foundation which operates Longwood Gardens. About half of the money required to run Longwood Gardens comes from onsite revenue - ticket sales, special events, the restaurant, Gardens Shop, classes and members. The other half comes from the Longwood Gardens, Inc. endowment.

The Longwood Foundation has made grants to non-profits of over 2 billion dollars since 1937. Historically, investments and grants have been made primarily in education, health care, environmental, housing, arts, social services, and civic sectors. Funds are also provided to Longwood Gardens, Inc. for some large capital projects.

## **Longwood Staff** (at time of printing)

Please know these numbers change frequently.

180 Full-time employees (including 47 gardeners and 4 arborists)

225 Part-time employees (including 42 part time gardeners)

800 volunteers

50 students

# Longwood's East Gardens Highlights

## East Garden Highlights

The East Gardens are considered to include the following areas:

Open Air Theatre, Flower Garden Walk, Flower Garden Drive, Square Fountain, Compartment Gardens, Theatre Garden, Flower Garden Drive (or Allée), Peirce's Woods, Italian Water Garden, the areas surrounding the Small and Large Lakes, the Visitor Center, Terrace Restaurant, Peirce du Pont House Conservatory and the grounds surrounding the house.

Horticulture staff – These areas are cared for by the staff and volunteers listed below. Gardeners can be moved to areas as needed. When seasonal displays need to be planted, for example planting over 100,000 spring bulbs, many extra hands come to help.

7 full time employees

9 part time/ seasonal employees

Approximately 20-24 volunteers

1-2 interns or other students/week most of the year

## Open Air Theatre

This historic Theatre has inspired guests since it opened in 1914.

- The Open Air Theatre was built to house theatrical performances, concerts and garden parties. Performances have varied throughout the years, but the Open Air Theater is an active and vibrant performing venue hosting world class performances each summer. 1500 guests can be seated in the Open Air Theater.
- Daily fountain shows with recorded musical accompaniment occur regularly all season long.
- Historical note: Originally, the sloped auditorium was flat and tables filled the space for garden parties. In 1925, Pierre renovated the Open Air Theater, adding dressing rooms under the stage for 100 performers, as well as colored fountains and lights to the stage. The excavated soil was used to create the present day venue.



# Longwood's East Gardens Highlights

## Flower Garden Drive and Taxodium Allee

- This 600-foot-long avenue runs parallel to the Flower Garden Walk.
- A magnificent allée of 27 huge bald-cypresses fronted by an arborvitae hedge provides a stately backdrop for a double flower border whose planting plan is redesigned each year.
- The bald-cypresses on the north side of the drive were planted by the Peirce family in the 19th century. Over time trees were lost. Pierre du Pont had mature specimens, approximately 70 feet high in height, transported to Longwood and planted to create a double row of these majestic trees.

## Flower Garden Walk

- The Flower Garden Walk was founder Pierre du Pont's first garden, planned and designed just after the property was purchased in 1906.
- The plantings bordering the 600-foot-long brick walk are a mixture of annual and perennial flowers, spring bulbs, woody shrubs and ornamental grasses. Hundreds of thousands of spring bulbs are followed by vibrant summer annuals and fall mums and annuals.
- Color plays an important role, progressing from cool lavenders and blues to fresh pinks, reds, oranges and warm yellows, and ending in soft calming whites.
- The garden is planted with new seasonal designs two times a year with plant substitutions in the spring and late summer.
- Over a hundred thousand spring flowering bulbs are planted each October.
- The Round Fountain at the center of the Flower Garden Walk was the first fountain to be built at Longwood Gardens. In the summer months, Mr. du Pont's nieces and nephews used to put on their 'bathing costumes' and splash around in the Round Fountain.
- At the end of the Flower Garden Walk, you will find a semi-circular stone "whispering bench". Encourage guests to sit on one end of the bench and have a friend sit at the other end. Then, they can whisper towards the center of the bench, and notice how their voice travels around the curve! The phenomenon works because the bench is a perfect semi-circle.

# Longwood's East Gardens Highlights

## Peirce's Woods

- Pierre du Pont purchased the property in 1906 to save the trees from being cut down for use as timber. It is named after the Peirce family who originally owned the property.
- Peirce's Woods was formally designed by landscape designer, Gary Smith in the 1990s. Smith designed it to be an "art form" garden with a series of nine informal garden rooms, separated from one another by "walls" of shrubs and featuring the most ornamental characteristics of the eastern deciduous forest.
- Seasonal change is dramatized in Peirce's Wood's. Spring offers the greatest display of flowers while summer is mostly green. In the fall Peirce's Woods is ablaze with color.
- The major goal of Peirce's Woods is to attract attention to the value of native plants simply by getting guests "turned on" about their beauty.
- In May flowering shrubs and trees and spring ephemerals (woodland plants that take advantage of the full sun before the canopy fully leafs out in spring to flower) are a highlight of the season.
- Peirce's Woods Plaza - This entry courtyard transitions from the formal Flower Garden Walk to the lush woodland of Peirce's Woods. Interesting containers including bog gardens and unique combinations fill the space.
- Scale is a primary design element of Peirce's Woods, so protecting the mature trees is essential. All the paths and irrigation lines added in the 1990s were hand dug to protect the mature tree roots.

## Small Lake

- This manmade lake is a watery habitat home to a diverse animal population that includes ducks, green and blue heron, frogs and bluegills.
- The shallow lake is no more than six feet deep.
- Spring House: Connecting the Small and Large lakes is a picturesque stream that meanders down the slope into a grove of pond-cypress. Installed in 1964 with a spring house added the following year, the stream was broadened in 1997 with numerous weirs, and redesigned landscape in 1998.
- The Bald-cypress *Taxodium distichum* "knees" are knobby protrusions of the root structure above the wet soil they live in. The function of these knees is unknown.

## Large Lake

- The Lake is home to a diverse animal population including ducks, green and blue heron, frogs, bluegills, golden orfe fish, catfish, bass and sunfish.
- The Lake is approximately 15 feet deep at its center.
- A love temple, or gazebo, can be found at the Large Lake. It was donated to Longwood in 1967.
- Noteworthy plants: Bottlebrush buckeye; *Aesculus parviflora*, *Hydrangea* and

# Longwood's East Gardens Highlights

daylilies color the bank of the large lake in July.

## Canopy Cathedral Treehouse

- Inspired in design by the traditional wood-frame stave churches found in Norway, Canopy Cathedral is one of three tree houses built in 2008 to celebrate the importance of trees to the Garden's past, present and future.
- The sentinel dragons which stand guard outside the treehouse were designed and carved by the treehouse builders: Treehouse Workshop.
- The Douglas-fir timbers that make up the columns, beams, rafters and ties of the timber frame and reclaimed Douglas-fir flooring were milled from salvaged logs from older buildings. The carvings and siding of the Canopy Cathedral are all western red cedar.

## Italian Water Garden

Pierre du Pont's love of water and fountains is embodied in this formal garden.

- The Garden features six large and twelve small blue-tiled pools with 600 jets of water and a water staircase that recirculates 4,500 gallons of water each minute.
- The Italian Water Garden was built from 1925 -1927 after an inspirational trip to Europe by Pierre and his wife Alice. A former swamp was transformed into a formal water garden.
- Two rows of specially pruned or "pollarded" little leaf linden trees frame the Garden. The formal pattern of the rectangular pools surrounds the central round fountain with the green lawn as a backdrop.
- The larger main fountain at the rear has the highest spray of water. Guests might note that even the jets of water within the pools are carefully aligned.
- The four pools look equal in size from the overlook but when viewed from the side it is very evident that the two rear pools are longer in length.
- Pierre's own plans – including 50 pages of hydraulic calculations – were the driving force behind this garden. When the Italian Water Garden was renovated in the early 90s, his handwritten calculations were found to be spot-on accurate.

## Peirce's Park

- Peirce's Park, located just east of the Peirce du Pont House, was one of the first collections of trees in the nation. Some of the trees found here are approximately 200 years old. All are labeled with small brass tags on the north side of the trunks.
- The Sylvan Fountain was originally controlled by a switch in the du Pont House.
- Many valuable trees have metal lightning protection systems. They consist of a terminal, commonly referred to as a lightning rod, a grounding rod and a large copper cable that connects them. The copper cables are often visible to guests.

# Longwood's East Gardens Highlights

## **Managed Native Meadow**

- Once the site of a planted field, orchard and pasture, this area was recreated as a meadow to add a new dimension to the horticultural display of Longwood Gardens.
- The meadow represents the first stage in the natural succession process: the progressive replacement of one plant community by another, from field to forest.
- The native wildflowers found there have either been planted by Longwood horticulturists or independently established from seed dispersed by wind or animals.
- In 2013, the Meadow Garden underwent a restoration, and was expanded from 40 to 86 acres. Interpretive shelters as well as the Webb Farmhouse, additional walking paths, and more extensive meadow and wetland habitat have been added along with other interpretive elements.

# Open Air Theatre

Longwood Gardens is the living legacy of Pierre S. du Pont, inspiring people through excellence in garden design, horticulture, education, and the arts. In keeping with our commitment to distinction in the arts, Longwood Gardens offers an amazing array of theatrical performances through our Performing Arts program. Longwood Gardens' Open Air Theater is a beautiful and unique venue for these performances and concerts, giving guests a one-of-a-kind experience as they watch incredible performances unfold before the beautiful backdrop of our Gardens. The Open Air Theatre combines Pierre du Pont's love of theatre with his passion for engineering. Pierre du Pont combined his love of the theater with his engineering skills to create a stunning, one-of-a-kind performance venue for the enjoyment of all Guests who visit Longwood Gardens.

## **Highlights**

- The Open Air Theatre is inspired by outdoor European theatres. Pierre du Pont designed and built the Theatre in 1914. He was especially influenced by the small outdoor theatre at Villa Gori in Italy.
- Pierre initially installed simple fountains into the stage. The jets were controlled by foot pedals found in the orchestra pit.
- In 1926 to 1927 underground dressing rooms were built, the seating area was sloped and the fountains were greatly expanded to 750 jets recirculating 2,000 gallons a minute and
- Our fountain shows are illuminated by 600 lights. A water curtain was added to completely hide the performers from the audience.
- The Control Tower was built in 1933, and had a manually operated switchboard. It has since been modified to a fully computerized switchboard with an updated electrical sound system. The top floor houses the fountain and light controls, while the bottom floor manages the sound system.
- The Savoy Company has performed annually since 1916, and the Brandywiners since 1932. Only during World War II were the performances cancelled.
- The Open Air Theatre is one of the largest stages in the Brandywine region, 62 feet deep and 34 feet wide. It is encompassed by a wall of American arborvitae, a backdrop of historic conifer and deciduous trees, and the sky for the ceiling.
- The Open Air Theatre can accommodate 1500 seated guests and is still an active, vibrant performing venue.
- The Open Air Theatre is the only fountain garden that operates in the fall and during the Christmas Season (normally runs May through first week of January, as long as temperatures are above 28 degrees).
- Over the past century, thousands of performers have entertained audiences in the Open Air Theatre. About 1,500 performances in 100 years have been enjoyed outdoors under the sky and stars.

# Open Air Theatre

## **Interpretive Tips**

### Logistics

- At the start of your shift, check the Daily line-up for today's events and happenings. Be sure check that the fountains will be running. If there is an evening concert, occasionally Longwood stops the daily five minute fountain shows in order to prepare for the event. It is a good idea to also check in with a GSA for the latest updates.
- For guests interested with fountains and hydraulics, encourage them to also visit the Italian Water Garden.
- Drinking fountains are located at the entrance to the Open Air Theatre as well as at the entrance to the restrooms which are found on the lower level of the Theatre Tower.
- Check to be certain the restrooms are in working order.
- For a complete schedule of the 2016/17 summer performance series, guests can pick up a brochure in the Visitor's Center, and go online to the Longwood Gardens website.

### Wayfinding for Guests – based on guest interest you can suggest the following

- Ask guests if they have ever been to a performance at the Open Air Theatre. If not, encourage them to go online or stop at the Visitor Center and pick up one of the Summer brochures to see who will be performing in our summer series events.
- For guests interested in fountain displays suggest they see an Open Air Theatre show (accompanied by music). The shows run on the hour from 10am to 5:55pm daily. Also suggest they visit Italian Water Garden.
- Encourage guests to have a look at the Reader Rail sign and explain how it is a visual narrative of events that have occurred over the last 100 years.
- For guests who want more of a behind the scenes look at the Open Air Theatre, suggest they visit again on a day Longwood is offering the Open Air Theatre Insider Tour. These tours occur on Thursdays through Sundays, from May until October.

## **Stories and Interpretive Tips**

### History

- Pierre du Pont delighted in the performing arts. Share with guests how he played with a toy theatre as a child that was designed by his boyhood friend, artist Maxfield Parrish.
- Describe how Pierre and his Alice traveled abroad to Italy and France on several occasions, and visited many villas and gardens. Pierre took a special interest in garden theatres which were popular in Europe in the 17<sup>th</sup> and 18<sup>th</sup> centuries. After a visit in 1911 to the charming and intimate Villa Gori in Siena, Italy he was inspired to build a larger version at Longwood on this site where an old barn existed.
- Share with guests how Pierre combined his love for theatre with his passion for hydraulics in the Open Air Theatre. Weeks after the debut of the Open Air Theatre in 1914, he had fountains installed on the stage that were operated by foot pedals in the orchestra pit. Inspired by the illuminated colored fountains he witnessed at Chicago's World Columbian

# Open Air Theatre

Exposition, in 1893, Pierre installed his first illuminated colored fountains in 1926 when he redesigned the Open Air Theatre.

- Discuss the different types of concerts and performances that have occurred over the 100 years in the Open Air Theatre. Two companies have been performing annually since their debut, The Savoy Company (the oldest amateur performing arts company in the country), continues to excite audiences with Gilbert and Sullivan productions, since 1915. The Brandywiners from Wilmington, Delaware have continued performing Broadway musicals since 1932. Also, the Kennett Symphony shares a concert legacy on the Open Air Theatre stage. John Phillip Sousa, a good friend of Pierre's, performed with his marching band in the Open Air Theatre in 1928.
- Talk about the different concert venues throughout the Gardens. They include the Italian Water Garden terrace, the plaza outside the Peirce du Pont House and the East Pavilion. The Exhibition Hall and the Ballroom in the Conservatory have also hosted many different types of concerts and performances since the 1920's.

## The Beauty of an Outdoor Garden Theatre

- Share with guests how Pierre wanted instant gratification in the appearance of his outdoor theatre and imported many mature trees as a backdrop for his stage. Most of the trees selected are conifers, including the exotic *Cunninghamia lanceolata* (please see Champion Tree document). The wings on the stage are carefully sheared American arborvitae.
- For guests on their way to the Flower Garden Walk, encourage them to walk through the Theatre Garden, located behind the Control Tower. For guests needing inspiration for sunny hot garden beds, the Theatre Garden offers many nice selections and grouping combinations. This garden contains all drought and sun tolerant plants. Point out that many of the plants chosen for the display have bluish-gray color foliage.

## The Fountains

- Guests will appreciate the story of the first fountains Pierre installed at the Open Air Theatre. Shortly after his theatre debut in 1914, he installed secret fountains which he noted, "produced no scenic effect and served as surprise measures only". Five fountain jets were built into the stage and were operated from foot pedals hidden in the grass immediately in front of the stage. Share how Pierre's older nephews would entertain the younger cousins by jumping on the pedals while they dashed around the stage hoping to get soaked by the fountains.
- Share with guests how Pierre decided to install elaborate colored fountains in the Open Air Theatre after successfully creating the Italian Water Garden. Ask guests to imagine how state-of-the-art this would have been in the mid-1920's when most homes still did not have running water.
- When the fountains are running, point out the unique row of fountain jets that line the front of the stage. The jets are six inches apart and can shoot 2 – 10 feet in the air. They actually create an effect of a curtain especially when illuminated, and can help conceal the changing of a stage set in between scenes.

# Open Air Theatre

## Under the Stage and above Stage Right

- Guests might be curious as to where the dressing rooms are located for the performers. Describe the space under the stage and share that there is enough space below for 100 performers. The dressing rooms actually extend out to the edge of the drive and encompass most of the ground below the lawn.
- Discuss how the dressing rooms look very much the way they did at the time they were constructed. The restrooms remain intact with the original tile, marble and fixtures, and the original wood molding survives throughout the space. Share that the walls have memorabilia that dates back to the early years of the Open Air Theatre.
- Ask guests how they think performers get from one side of the stage to the other without being seen by the audience, since there is no curtain backdrop at the back of the stage. Performers can only get from one side to the other side by entering below the stage, where the dressing rooms are located.
- All concert halls have a green room and the Open Air Theatre does, too. Share with guests that the Green Room is actually located outdoors on the second level, west of the stage. The space is encompassed by tall trees, alluding to a real green room atmosphere.

## Performances

- If you have been to a performance in the Open Air Theatre, share your experience with guests. Who was performing? What was the weather like? Where were you seated? Was there a fountain display after the performance?
- Talk about how Pierre liked military bands and that John Philip Sousa, the famous band director and leader of the US Marine Band performed 14 times in seven years at Longwood Gardens.
- Guests might be interested in knowing that Pierre felt his theatre was not good for speaking and that sound amplification was minimal. He noted, *"the spectacular is about all we can produce successfully."* Most performances during his lifetime were dance, musical theatre, and concerts. Eventually plays were presented. Today, modern amplification and lighting permit almost any kind of production.
- For guests who enjoy big Broadway hits or Gilbert and Sullivan, encourage them to consider attending The Savoy Company or the Brandywiners musicals. Both local companies perform annually every summer, and have continued this tradition since their debuts in the Open Air Theatre. The only years the companies did not perform, was during WWII.
- Guests interested in who has performed at the Open Air Theatre in the last 100 years, refer to the list on page 10.

## **History of the Open Air Theatre**

Pierre du Pont always loved the theatre. As a child, he played with a toy theatre which was designed by his good friend Maxfield Parrish (who grew up to become the celebrated painter), and in college he attended performances whenever possible. In 1913, Pierre helped establish the du Pont Theatre, still thriving today in the Hotel du Pont in Wilmington, Delaware. An idea for a venue at his country estate most likely resulted from his desire to bring excitement and



# Open Air Theatre

pleasure to the guests who attended his celebrated garden parties, and from his travels throughout Italy and France. Outdoor garden theatres were popular in Europe in the 17<sup>th</sup> and 18<sup>th</sup> centuries, and Pierre toured many gardens and villas where he would have seen outdoor stages. In November 1912, he drew two rough sketches for an outdoor theatre on the site of the original Peirce barn. Two months later he visited the Villa Gori in Siena.

On his return from Italy, and inspired by the small theatre at Villa Gori, Pierre excavated the barn site, brought in stone to form retaining walls around the 62 foot wide stage, and planted hemlock to conceal the wings on either side of the stage. The debut of the Open Air Theatre at the 1914 Garden Party was a resounding success. Three hundred guests dined around small tables on the then-flat auditorium lawn following which the newspaper noted:

*Just after dark electric lights were turned on, simultaneously illuminating the stage in front and sides, and a spot light discovered four couples descending from the terrace above the stage to the classic strains of Beethoven's music. The dance was performed on the stage and its gorgeous costuming and finely executed, dignified figures elicited hearty applause.*

After half a dozen quaint numbers came the climax:

*The finale was a frolic by the harlequins, who, much to the surprise of the guests, danced among them, throwing confetti and garden roses, and then winding their way out in a path of light, finally disappearing amid the trees. The audience might easily have imagined itself transported to the day of Marie Antoinette and the scene Versailles, with the wonderful setting of theatre, lights, dancers and nature.*

Two weeks later, Mr. du Pont began installing simple fountains into the stage. He was inspired by secret fountains in Italian gardens, the *giochi d'acqua*, which were hidden in the pavement and would spring to life unexpectedly to douse unsuspecting visitors at the owner's pleasure. Longwood's jets were controlled by foot pedals in front of the stage. On hot afternoons, Mr. du Pont's older nephews would jump on these valves while the younger cousins would dart around to get soaked by the fountains. The jets were first incorporated into a Garden Party performance in 1915 danced by the Florence Noyes School of Rhythmic Expression, aesthetic dancers jokingly termed "anesthetic dancers" by Mr. du Pont.

Over the next decade, the Open Air Theatre was used several times a year for theatrical performances, garden parties, concerts and as a place of amusement for his nieces and nephews. However, not entirely pleased with the flat layout of his outdoor theatre garden, which restricted visibility of the stage, Pierre decided to improve the facilities. In 1926 to 1927 underground dressing rooms were built, the seating area was sloped, and the fountains were greatly expanded to 750 jets recirculating 2,000 gallons a minute and colorized with 600 lights. A water curtain was added to completely hide the performers from the audience. The reimagined Open Air Theatre was now one of the most unique theatre/fountain gardens in the world. Several hundred performances took place under Pierre du Pont's sponsorship until 1954.

Dance figured prominently during the Teens and Twenties with such iconic performers as Martha Graham. In the 1960s, American Ballet Theatre and the Pennsylvania Ballet had their turns at starry-roofed performances. In more recent times, numerous dance and acrobatic groups have enlivened the stage with both grace and daredevil excitement.

# Open Air Theatre

Musical theatre has been a mainstay in this venue. The Savoy Company from Philadelphia was the first theatrical company to perform here in June 1916 with the Gilbert & Sullivan operetta, *Patience*. They returned in 1923 with the *Pirates of Penzance* and have since mounted 88 productions, except in 1927 and during World War II. Mr. du Pont would always provide a Longwood supper for the cast as well as sandwiches on the train back to Philadelphia. In total Savoy has given nearly 150 performances in the Gardens.

Another annual tradition began in 1932 when, after returning from an operetta, Frances Tatnall boasted that she and some of her friends could produce a better show than the one they had just seen. She enlisted the help of William Winder (Chick) Laird, Mr. du Pont's nephew, as stage director and Frederick W. Wyatt, a prominent local conductor and vocal teacher, to direct a hastily assembled cast in *The Pirates of Penzance*. It was performed at Longwood, and the group known as The Brandywiners was invited back every year, except during the war. Older members recall the warm enthusiasm of Pierre du Pont, who on at least one occasion helped build scenery. Chick Laird recalled his uncle's unforgettable, dry humor:

*"At rehearsals he would frequently come to the theatre and have large baskets of fresh peaches brought for the actors to enjoy. Once, he called the group together to ask that they not throw the pits from the peaches into the shrubbery. He had a passionate dislike for littering. That same night, one of the performers dropped the peach pit onto the stones at the entry to one of the wings. When this lad reached home that night, he found the peach pit in his jacket pocket neatly wrapped in a linen handkerchief monogrammed P S du P. No one ever found out what sleight of hand was used to get that pit into that handkerchief and into that pocket. Needless to say, the handkerchief was carefully laundered by the offender's mother and returned to its owner with profuse apologies."*

The Brandywiners' 2014 production of *Annie* is their 80<sup>th</sup> at Longwood, most of which have been well-known Broadway shows. Since 1932 they have performed about 500 times here (including previews).

Grand opera has occasionally upstaged operetta. *Carmen* was presented in 1949, *Aida* in 1950, *Madame Butterfly* in 1951, and *The Barber of Seville* in 1957. The Opera Company of Philadelphia arrived in 1979 with *The Marriage of Figaro* and performed *The Barber of Seville* in 1980.

Shakespeare was first presented in 1933 with two performances of *The Taming of the Shrew* by the Wilmington Players. Seventeen productions and 37 performances of his plays were performed annually from 1960 through 1976 by The Lyceum Players, a Wilmington-based theatre group.

Concerts have been the main offerings over the years, especially in recent decades. Mr. du Pont liked military bands, but in the early years the most important concerts were held in the Conservatory for fear of rain. John Philip Sousa and his Band were a favorite and gave 14 performances over seven years, but all were indoors except for an evening concert in 1928 held in the Theatre. The United States Marine Band first performed indoors in 1922, and outdoors occasionally starting in 1928. In 1951, two Theatre concerts a year by the Marines became the norm and continued through 1986 (excluding 1975). An extraordinary classical highlight was a stage performance by The Philadelphia Orchestra conducted by Eugene Ormandy in 1941.

Mr. du Pont repeatedly hosted outdoor concerts by the DuPont Chorus, DuPont Band, and the

# Open Air Theatre

Orpheus Club. These continued after his death in 1954, to which were added many performances by the Coatesville Corallers, but it was not until 1981 that the performance scope greatly expanded with concerts before each Main Fountain display several nights a week. Every imaginable type of performance has been scheduled, from classical to pop, folk to world, jazz to rock. The Kennett Symphony of Chester County has been a regular since 1986, with up to three performances a summer.

In 2008, the overall emphasis shifted to more big-name musical acts. Many famous artists have brought their world-class talent to the Longwood stage.

## Features of the Open Air Theatre

### Control Tower

The Control Tower was constructed in 1933. Cutting edge in its day, the original manually operated toggle switchboard worked the fountains and lights. Computerization of the fountains in the mid-80's coordinated the fountains, lights, and music. The Heritage Exhibit in the Peirce du Pont House has on display the original fountain control board, with dozens of switches and glowing pilot lights. The Control Tower's second floor systems control the lighting and fountain display and the first floor system controls the sound for the stage. The Control Tower terrace is used for VIP seating. Guests can enjoy a completely unobstructed view of the stage from the exact center.

### Stage

The stage is 62 feet wide and 34 feet deep and is one of the largest stages in the area. The space is so big that artist and actor movement that take two steps in a traditional indoor theater take ten steps here at Longwood's Open Air Theatre. The stage can also be extended during performances by incorporating the upper lawn area or the second tier. The Brandywiners have been known to take advantage of the lawn during productions including:

- In *Oklahoma*, Curly made his entrance on horseback; he came down the road and across the grass onto the stage.
- In **The Music Man**, a High School marching band marched down the road and onto the stage, while playing "76 Trombones", the musical's most famous song.
- In **Carousel**, there was a full-sized carousel on the 2<sup>nd</sup> level of the stage.

There are two five-sided buildings on either side of the stage; they are original, one is now used for storage and the other is now used for electrical systems.

### Orchestra Pit

The orchestra pit is located in the center on the ground level, below the stage. Live music accompanied performances in the early decades of the 20<sup>th</sup> century, so there was more of a need for an orchestra pit. It is still used for some performances, but most of the performing companies rely on recorded music today. Many famous orchestras have taken their place up on the stage, including John Phillip Sousa's Marine Band and the Philadelphia Orchestra.

# Open Air Theatre

## Fountains:

- WATER CURTAIN: The water curtain has jets that are six inches apart and shoot 2-10 feet in the air; the water curtain is illuminated with white lights to create a curtain effect.
- FOUNTAINS ON-STAGE: There are seven circular basins/fountains built into the main stage floor, they have aluminum covers which are removed for fountain shows. These fountains are illuminated from below, versus lighted by spotlights, to create a more vibrant color. There are 750 jets illuminated by 600 colored lights.
- TWO FOUNTAINS IN UPPER LEVEL BASINS
- TWO ISOLATED ROOF FOUNTAINS – These fountain are not in use at this time.

Altogether, the fountains produce several hundred jets of water which are re-circulated by 14 pumps at a rate of 2,000 gallons of water per minute. Compressed air was added so the fountains could reach new heights. Today the highest jets on the second level reach 50 feet in the air.

Pierre designed the stage so that the prevailing winds would blow onto the stage, rather than the audience, keeping fountain spray away from them.

# Flower Garden Walk

## **Introduction**

The Flower Garden Walk was the first garden at Longwood Gardens and it is a celebration of its history, heritage and horticulture. Originally designed by Longwood's founder, Pierre S. du Pont in 1907, it is a horticultural gem and iconic symbol of Longwood. The formal beauty of Flower Garden Walk is created through extraordinary design, plant selection and meticulous care. Bold seasonal displays are grouped by color and are the primary feature of this historic garden. Permanent plantings are used to shape and provide year round focal elements, while dramatic features such as fountains reflect the ingenuity of Pierre du Pont, and provide a sense of pleasure and excitement. While the specific nature of the Flower Garden Walk has evolved over time, the overall character and the use of the landscape has remained consistent.

## **Highlights**

- The Flower Garden Walk is 600 feet in length and slopes from both ends to the center, where the Round Fountain, Longwood's first fountain, is located.
- The Flower Garden Walk was founder Pierre du Pont's first garden project on his new property in 1907. The Square Fountain and lower 'Compartment' Garden spaces were added in 1908.
- Designed in curved washes of color, the Flower Garden Walk design flows along the walk from cool purples and pinks, to warm energizing reds, oranges and yellows, finishing with soft clean whites.
- This garden features the finest plant selections including promising new plants from our Research Department, as well as Longwood' cultivars and hybrids.
- At least 65% of all plants displayed on Flower Garden Walk are grown in Longwood's production greenhouses or nursery.
- The Flower Garden Walk display is planted with new seasonal designs twice a year - spring tulips and the summer display. Spring and fall annuals are added to extend the display.
- Over 100,000 spring flowering bulbs are planted during two weeks in October for the next year's spring display.

# Flower Garden Walk

- The seasonal displays are designed at least one year in advance of planting by Longwood's horticulture staff.
- At the end of a display, nearly all plants with the exception of permanent shrubs, perennials and standard tree forms, are composted.

## **Interpretive Tips**

### Wayfinding for Guests – based on guest interest you can suggest the following

- Fountains in the Open Air Theatre go off at 10:00, 11:00, 12:00, 1:00, 2:00, 3:00, 4:00, 5:00 and 5:55 pm for five minutes and is accompanied with music. Encourage the guests to take a moment to watch the fountain show. Schedules change seasonally and occasionally due to conflicting events.
- Help guests to understand the many ways to explore Longwood. Encourage guests to visit the other areas of the East Gardens. Direct them to a path that suits their interests.
- If they'd like to see more annuals on display they can stroll through the Trial Garden and the Idea Garden after they explore the East Gardens (point out the location on the map). Talk about how these areas are terrific for home garden inspirations.
- When you are at Peirce's Plaza you can direct guests to a woodland exploration following the meandering trails of Peirce's Woods, or they can go directly to the Italian Water Gardens via the lakeside paths.

As guests admire the plants, this is a great time to talk about:

### Excellence in design and display

- Engage the guests by asking if they are familiar with the different flowering plants, and if they have ever grown any of the plants in the display. Point out how the same species of plants are repeated in the display design, in different color blocks. Repetition is a key design element on the Flower Garden Walk.
- Explain that this garden is formally designed and highly managed to create this beautiful display.

# Flower Garden Walk

- Talk about color patterns and how the garden plays into our senses. The blues and purples evoke a restful and calming effect, while the boldness progression of the pinks, reds, oranges and yellows fill us with excitement, before finally transitioning into the tranquil white flowering plants.
- Docents should use flipbooks to share images of the Flower Garden Walk in other seasons. Talk about how the Garden changes through the year, and encourage guests to come back and visit.
- Point out plants that are displayed for their leaf color or fruit. Examples: *Capsicum annuum* 'Purple Flash' has purple foliage and beautiful small purple peppers (see page 11). Also, talk about the plants that are used for texture in the Garden; two examples are coleus with ruffled leaves or dusty miller; with soft, fuzzy leaves.
- Point out plants with fragrance and ask guests if they are picking up on any scents. Examples: Lilies, and *Brugmansia*; commonly called angel trumpets (see page 12).

## Excellence in Horticulture

- As guests admire a standard tree form point out that the production gardeners take ordinary plants and display them in extraordinary ways. Example; plants like the vine *Allamanda cathartica* (yellow flower; see page 12), are trained into a standard tree form.
- When guests exclaim "my plants never look this good!" you have a great opportunity to explain that the plants are carefully cared for by staff and volunteers. Each plant has many hands that touch it, pinching and grooming the plant to create that perfect beauty while it grows in our production facility and also when planted in the beds. This keeps our plants healthy and blooming.
- When guests are admiring an unusual plant, it can be an opportunity to talk about research at Longwood. The Research Department trials new plants to keep displays at Longwood relevant and exciting. Our Cannas are a great example. The New Guinea impatiens is another example of a plant developed Longwood Gardens (see page 11).
- Guests will be amazed to know that the plants on Flower Garden Walk are hand watered. Hand watering is better for the flowers because using sprinklers can cause plant disease. The gardeners can also selectively water only the plants that need it. If guests ask how long does it take to water this large garden, there is not one answer. It depends on the weather, plant size and watering needs from week to week.

# Flower Garden Walk

- Guests may wonder how we can grow coleus and impatiens in full sun. It's a misnomer that these are just shade plants. Many coleus cultivars and some impatiens species prefer a sunny spot and can't tolerate heavy shade.

## Sustainability

- Point out the “black gold” (rich black soil) that the plants are growing in. Healthy, beautiful plants come from this fertile soil. Each year the garden staff adds nutrients to the soil in the form of natural mulches and compost created on the property.
- Nearly all the plants from this Garden are composted and come back in the form of compost or mulch! We generally do not keep plants because we want every guest to see a wonderful display full of beautiful plant specimens.
- You can point out that the garden is a haven for insect life and pollinators – bees busily collecting nectar to take back to our hives, and from September – October, guests might see many hummingbirds flying around the pink and red borders early in the mornings before they migrate south.

## History

- The Round Fountain was the first fountain at Longwood.
- Encourage guests to admire the length of Flower Garden Walk. At 600 feet long, it's two lengths of a football field. Its size is part of what makes it so impressive.
- The Walk was designed by Pierre du Pont to be wide enough for guests to pass without bumping elbows. Pierre commented that the paths should be wide enough for “two people walking side-by-side to pass two other people walking side-by-side.”
- Pierre likened the lower compartment gardens to the various departments in a department store lending an air of privacy for the visitor. This element of creating compartment gardens has carried through current design and can be seen elsewhere in the Gardens (East Conservatory).
- Pierre and his wife Alice hosted annual large Garden Parties every June from 1909-1940. Fireworks were displayed on the 4th of July for close friends and family for a number of years.



# Flower Garden Walk

- In the early days, Pierre was known for passing out seeds to his guests and having them help in the planting of his Flower Garden Walk.....”*I have set my guests to work planting flower seeds whenever I have the opportunity*” – P.S. du Pont, 1907
- The Whispering Bench is a splendid conversation piece and a great place for a photo opportunity. Have two people sit on the opposite ends of the bench and have one whisper something while facing into the center of the bench. The whisper will be heard by the other individual. This is because the bench is a perfect semi-circle and the sound travels in the arc created by the semi-circle.

## **History of Flower Garden Walk**

### Origin

Planned and installed between 1906 and 1907, the Flower Garden Walk was the first of Pierre du Pont’s gardens at Longwood. The borders run parallel to the linear tree plantings of Peirce’s Park. Originally, a central gravel path ran the length of the garden and the borders were edged with boxwood.

Pierre described the garden as being of “*the old fashioned type*”, as plantings were heavily dominated by perennials such as *Dicentra*, *Paeonia*, and *Iris*. Seasonal accents included biennial foxglove and hollyhock, as well as spring and summer bulbs.

### 1957 to Present

After the death of Pierre du Pont in 1954, Longwood evolved from a private estate into a public garden. The resulting increase in visitor traffic and its impact on the landscape prompted the Trustee Advisory Committee and Longwood staff to begin modifying the Gardens. In 1971, Thomas Church (Longwood’s first landscape consultant), made suggestions to improve traffic flow and better connect the Flower Garden Walk, the Open Air Theater, Peirce du Pont House, and Peirce’s Park.

The garden south of the Open Air Theater, now known as the Theater Garden, and the brick plaza area at the west end of Flower Garden Walk were added to accomplish these goals.

At the east end of Flower Garden Walk, Mr. Church suggested that “in order to give more weight and feeling of better transition from the flower garden to the woodland garden, the eastern section of the Flower Garden Walk be designed wider on both sides.”

# Flower Garden Walk

In 1977, designer Sir Peter Shepherd saw to the expansion of the eastern end (the white border) and drew up the specifications for the formal *Carpinus* hedge that now accentuates the transition from the formal Flower Garden Walk into Peirce's Woods and beyond. Beds on the north side were originally rectilinear and continued into the north toward the paths leading into Peirce's Woods. The sculpted hedge now defines the end of the Walk.

## **Design Intent**

The design intent of the Flower Garden Walk is to create a bold composition of seasonal plantings grouped by color.

The display tends to have peak horticultural interest at two times during the year; once in April during the tulip display, and again in late summer when annuals are at their peak. However, the borders are full of color and horticultural interest for the full extent of the growing season.

Interest is achieved in the seasonal plantings by using generous sweeps of contrasting and complementary colors, textures, and heights. The composition is most effective when groups of plants "read to the eye" as interwoven blocks of color.

Vertical accents in the form of seasonal standards, taller seasonal crops such as Cannas and ornamental grasses complement the colorful tapestry on the horizontal plane. Plants are repeated on both sides of the border to achieve a balanced (but not symmetrical), composition, and different plant cultivars are also repeated within a color border to provide a sense of rhythm.

Heights of plants along the front of the border vary to provide interest along the front of the bed. Plants of varying heights are interplanted to emphasize color and textural contrast.

## **Display Design Process**

The process of creating plant displays begins with evaluation of past displays, generation of ideas for the future exploration, research and field trips. Themes are developed for each year and guide the content, color palette, and the look and feel of the displays. For the Flower Garden Walk, the working plan is prepared one year in advance.

All of the plans come together in a detailed database that shows when each type of plant will be needed, dates for each stage in the production process, and details about

# Flower Garden Walk

whether the plants will be grown at Longwood or purchased at some stage of development.

*Note:* The Idea Garden and especially the Trial Garden within it are sources of new plants and inspiration. The Trial Garden brings Longwood's research and plant evaluation process to the spotlight for all guests to experience. Our research team of horticulture experts continuously experiment with new plants and test the limits of old varieties to create ever changing and innovative displays. The Trial Garden's intention is to showcase Longwood's process, so that guests have a better understanding of the efforts that go into creating an extraordinary display.

## Seasonal Changes and Plantings

The goal is to provide color and horticultural interest for the full extent of the growing season. The garden is planted with new seasonal designs two times a year with plant substitutions in the spring and fall. Colorful displays are maintained from April through mid-October.

- Spring Tulip Display: over 100,000 tulips are planted in mid to late October of the preceding year
- Spring Annuals: planted during the month of April to complement tulips
- Summer Annuals: planted in mid-May after the threat of frost
- Fall Annuals: chrysanthemums and salvias are planted from mid-August to mid-September

## Features of the Flower Garden Walk

*"About the Flower Garden.....It is to be on the old –fashioned plan of straight walks and box borders at the edge of the flower beds"-P.S. du Pont, 1907*

### **Round Fountain**

- Water for the fountain was originally pumped from the Large Lake near the Italian Water Garden up to the Peirce du Pont House. From there it flowed back via gravity down toward the Small Lake, powering the fountain along the way.
- The Fountain is currently powered by the brick pump house on Flower Garden Drive.
- The central jet adds height at the center of the walk, sound to the area and texture to the water.

# Flower Garden Walk

- Originally, the fountain was three to four feet deep. Today, it is about two feet deep.

## The Lower Compartment Gardens and the Square Fountain

- The Square Fountain Garden was built to provide a setting to observe the reflections of sky and trees when viewed from above.
- This area is one of the few places a guest looks down at a garden.
- There are three 'rooms', set apart by arborvitae hedges (redesigned in the 1970's by Thomas Church).
- Tree peony, Siberian iris and *Astilbe* are in high bloom through May and the Wisteria Garden blooms in early to mid-May.

## Whispering Bench /Hornbeam Hedge

*"I had also planned a bench at one end of the garden path, which was to be semi-circular in form, the round being about ten or fifteen feet..."* Pierre S. du Pont, 1908

- Pierre S. du Pont designed a semi-circular stone bench to create an appealing destination and also to mark the east end of the Flower Garden Walk. (the original bench was replaced and moved in later design changes to its current location)
- The hornbeam hedge (*Carpinus betulus*) frames the Whispering Bench and creates a wall-like background to the east end of the Flower Garden Walk. It is pruned and trained by hand to create two archways through which visitors pass to enter Peirce's Woods Plaza.
- *Carpinus* is also featured in our Bonsai Display as a miniature grove of trees.

## Peirce's Woods Plaza

Though not a part of Flower Garden Walk, it is included here as it transitions guests from the formality of Flower Garden Walk to the more informal Peirce's Woods. In the entry courtyard, the Peirce's Woods horticulturists enjoy experimenting with containers of native bog plants such as sundews, pitcher plants, and horsetails. The informal

# Flower Garden Walk

groupings of containers in relation to the naturalistic arrangement of plants in Peirce's Woods provide an opportunity to showcase sun-loving natives.

## Operations and Plant Care

### Flower Garden Walk Garden Staff

- 1 full time gardener dedicated to the Walk
- 2 full time gardeners occasionally help out with planting and staking
- 2 part-time garden staff dedicated to the Walk
- 4 part time garden staff occasionally
- 7 regular volunteers one day a week
- 8 volunteers rotating on weekend duty

### Plant Production

About 65% of plants on Flower Garden Walk are grown on site in the production greenhouses and the growing fields. The rest of the plants are purchased from a variety of growers.

### Soils and Mulch

Longwood's leaf mold product is applied as a bed top-dress after the installation of summer annuals. It is made from leaves collected in the fall, aged in our compost facility and returned to the Gardens as mulch. Over time, leaf mold tends to raise the pH of the soil and add nitrogen for the health of the plants.

At the end of a display, most plants, excluding shrubs, standards and permanent plants will be composted at our on-site facility. These plants return to the Gardens as compost – completing a circle of sustainability.

Soil tests are taken annually and soil is amended as necessary to maintain desired nutrient levels.

### Fertilizer

Gardeners decide how much the plants need to be fertilized by taking soil samples in the spring. Plants are also spot fertilized as needed. Generally, the *Brugmansia*, *Pelargoniums*, and *Angelonias* tend to require more fertilization than other plants. The

# Flower Garden Walk

soil has been built up for 50 or more years with compost, mulch and natural materials, so it is naturally fertile and healthy.

## Staking and Pruning

Summer annuals are staked after planting in the borders. Staking is an important technique for getting maximum height and longevity out of the annual crops. Staking also helps maintain a clean front edge along the border. Plants receive regular grooming to remove spent blooms and foliage.

## Pest Controls, Including Deer

Seasonal crops are routinely affected by numerous pests including whitefly, spider mites, and deer. Pest controls are coordinated between outdoor display staff and the Integrated Pest Management Coordinator. Plant selections that require exhaustive pest control measures are avoided, but plant selection is not driven by potential pest/disease concerns.

When the tulip foliage begins to emerge in late winter/ early spring, an electric deer fence baited with peanut butter surrounds the beds. The 30 inch tall wire fence is installed each night and taken down each morning by Longwood students and interns before guests arrive.

## Growing Standards – Plants grown in a stylized tree form

Standard tree forms are plants which may not naturally have a tree form. They are started as cuttings with one straight stem trained to grow up a stake. Any side shoots or flowers are pinched or pruned off without disturbing the apical meristem (top growing point of the stem). Once the single stem plant reaches the desired height, the growing point is pinched or pruned off which causes the plant to start to branch. The plant is then shaped to create uniform branching. Heads of standards are uniform in shape, and well-proportioned to height.

Both *Allamanda* and *Euphorbia* are fast growing plants which get to display size in two to three years. The standards displayed on the Flower Garden Walk are not planted in their containers. However, each year they are dug up in the fall, repotted and returned to the production greenhouses.

# Flower Garden Walk

## Plant Information

### Annual Display Highlights

*Capsicum annuum* 'Purple Flash' – ornamental pepper

Native to South America, vibrant, shiny purple fruit and bluish-purple foliage are the reasons to grow this low growing annual. They are often used in Asian and Latin cooking.

*Canna* - add color, texture, and provide a tall element to the display. The beauty of the *Canna* inspired Longwood to begin a breeding program in the 1970s. Our program has produced more than 18 named cultivars that have been released into the trade and used here at the Gardens. Some of the cultivars are named after Philadelphia area towns, rivers, and themes such as 'Lenape', 'Conestoga', and 'Freedom'. These plants are compact with flowers that have a self-cleaning quality (meaning that the dead flowers fall to the ground instead of persisting on the plant). In addition to terrestrial varieties, we have also introduced several aquatic varieties.

*Canna* roots are kept from year to year and new plants are grown (*Cannas* can be susceptible to virus). We maintain extra *Canna* stock in our tissue culture lab. New Healthy new *Cannas* can be started by test tube in Longwood's Research Department's tissue culture lab.

*Impatiens* 'SunPatiens' - is a member of the *impatiens* family, but different because this *impatiens* is sun tolerant. One of the parent plants of 'SunPatiens' is the New Guinea *impatiens*. Our research staff worked to create the best cultivars of New Guinea *impatiens*, and introduced the first cultivars to the trade. Longwood no longer conducts research with the New Guinea *impatiens*.

See more on *cannas* and New Guinea *impatiens* at this link :

[http://www.longwoodgardens.org/highlightedgeneras\\_1\\_3\\_2\\_3\\_2\\_1.html](http://www.longwoodgardens.org/highlightedgeneras_1_3_2_3_2_1.html)

*Otacanthus azureus* - commonly known as Brazilian snapdragon, is an uncommon tropical plant. Spikes of purple flowers resemble the snapdragon flower. The 2013 season is the first time this plant is displayed on the Flower Garden Walk.

*Pelargonium* 'Caliente Fire' - is a beautiful clear red flowering ivy geranium that is under research at Longwood. It can also be found growing in the Trial Garden in the Idea Garden. It features lightly scented red flowers that bloom from late spring through fall. This is one of many examples of plants under plant trial at Longwood.

# Flower Garden Walk

*Ruellia simplex* - noteworthy due to its popularity among guests

Located at the Round Garden, it forms colonies of stalks and its height makes it unique among annual plants. It grows to about three feet, and its trumpet-shaped purple flowers bloom all summer. Also, the purplish stems and leaves of the plant are an ornamental plus. Native to Mexico, *Ruellia* is considered invasive in Florida.

*Solenostemon scutellarioides* – commonly known as coleus

There are different cultivars displayed in each color block on the Flower Garden Walk. Grown specifically for the beautiful variety in foliage color and texture, these plants produce an insignificant raceme, or flower. The leaves can be shades of green, pink, yellow, black, maroon, cream, white and red, and combine and contrast well with many plants. Coleus plants are heat tolerant and can be grown in full sun in this region.

## Standard forms

*Allamanda cathartica* ‘Hendersonii’ (yellow border)

Grown as a vine or shrub throughout the tropics, it is famous for its profusion of five inch sunny yellow flowers. The flowers have a delicate citrus scent. The plant has clean, bright green leathery leaves.

*Brugmansia* hybrid – Angel’s trumpets (near the Round Fountain)

Native to South America, it naturally grows as a large shrub or small tree. The soft pastel pink flowers are sweetly fragrant, especially in the evening.

*Buddleia alternifolia*- Butterfly bush (hardy, tree-form, around the Round Fountain)

It has fragrant light purple flowers on weeping, willow-like branches and blooms in early June. These plants have been trained as a tree-form since the 1980s. The bark has an interesting shredding quality.

*Euphorbia cotinifolia* - Caribbean copper plant (planted throughout the color blocks)

Usually this plant is grown as an ornamental shrub for its colorful and distinctive copper colored foliage. Small white flowers with creamy bracts bloom at the end of branches throughout the summer. They resemble the flower bracts of the poinsettia, and both belong to the same family. The plant is native to Mexico.

## **Permanent Perennials, Shrubs and Grasses**

### Perennials

*Paeonia lactiflora* – herbaceous peony (pink border)

Peonies bloom in mid to late May. Blooms are pink and very fragrant.



# Flower Garden Walk

*Silphium perfoliatum* – cup plant (yellow border)

This native has three inch yellow flower heads, with large triangular shaped leaves that join at the base to form a cup around the stem. The ‘cup’ catches and holds rain water. This perennial will grow six to eight feet tall, and blooms in mid-July. The seed attracts birds such as goldfinches.

*Veronicastrum virginicum* ‘Album’ – Culver’s root (white border)

This native has distinct white flower spikes, is four to five feet tall, and blooms July to September. It is a strong accent plant due to its vertical structure. It attracts a variety of bees, butterflies and moths. It grows well in the wildflower garden, and is a good cut flower.

## Shrubs

*Physocarpus opulifolius*– ninebark

‘Seward’, ‘Summer Wine’ – three to six feet in height arching habit, more compact (pink border)

‘Diablo’ – five to eight feet in height, more upright habit (below Flower Garden Walk, off the pink border)

This native deciduous shrub has outstanding deep burgundy foliage. It features pink or white flowers appearing in dense, spiraea-like clusters in late spring which attract butterflies. Flowers give way to reddish fruit. These cultivars have exfoliating reddish-brown bark.

*Rosa* ‘Radcon’ - pink ‘KnockOut’ rose (pink border)

This repeat bloom, drought tolerant rose grows to be three to four feet tall. One of several varieties in the ‘KnockOut’ family, it is vibrant pink and disease resistant. A very showy and low maintenance rose

*Vitex agnus castus* – Chaste tree (purple border)

Spikes of lavender flowers bloom in July and the bluish-green foliage has an aromatic scent, and delicate, tropical texture. It can grow to 15 feet tall, but Longwood maintains these shrubs at about four feet. In cold winters, *Vitex* will die-back to the ground. The fragrant flowers attract butterflies. It is an excellent choice for seacoast and resort areas.

# Flower Garden Walk

## Grasses

*Arundo donax* - giant cane or reed (orange border)

Guests often think we are growing corn since this reed resembles the appearance of corn stalks. It can reach 20 feet in height. The leaves are long and flat, and the large dense flower plumes bloom in late summer. The grass bears no fruit or seeds, and spreads through rhizomes and stem nodes. Notably, the stiff stems of the leaves are used to produce the reeds for clarinets, oboes and other wind instruments.

*Saccharum ravennae* – hardy pampas grass (red border)

One of the tallest grasses which can reach 12 – 15 feet in height

It has blue-green foliage, and tall stately plumes. A very coarse textured grass that adds a vertical accent to the garden, as well as winter interest.

*Panicum virgatum* ‘Northwind’ – switch grass (pink border)

This native upright grass has bluish-green foliage which turns golden yellow in fall. It grows four to five feet tall and is topped with attractive narrow yellow plumes in September.

## Trees

A grouping of each of the following trees is planted around the Theatre Garden and the Flower Garden Walk Patio. These trees all have white flowers and bloom in the order that they are listed. It is a subtle, but stunning, succession of bloom and a thoughtful perspective in design.

*Poncirus trifoliata* – trifoliolate orange, early May; fragrant

*Cornus florida* ‘Cloud Nine’ – native dogwood, mid-May

*Cladrastis kentukea* – yellowwood, late May

*Chionanthus virginicus* – fringe tree, end of May; fragrant

*Stewartia pseudocamellia* – Japanese stewartia, mid-June

*Carpinus betulus* – European hornbeam (surrounding the Whispering Bench) The hornbeam is one of the best small trees for a formal, refined appearance and it takes shearing well. Hornbeam is used to create the tree hedge surrounding the Whispering Bench. Notice the meticulously pruned archways that lead to Peirce’s Woods Plaza. The gardeners use scissors and hand pruners to prune the hedge. This avoids damaging the leaves and gardeners can better control the size and shape of the hedge.

*Magnolia denudata* – Yulan magnolia (located on the north side of Flower Garden Walk, off the path leading north toward the Peirce du Pont house)

The pinkish-white flowers bloom in mid-spring before foliage emerges. This small tree has a low branching rounded habit, and can reach 30 feet.

# Flower Garden Walk

*Salix elaeagnos* – rosemary willow (located below Flower Garden Walk)  
Beautiful, soft gray-green narrow leaves

*Styphnolobium japonica* – Chinese scholar tree (located at the base of the Open Air Theatre steps) \*State Champion Tree (see the Champion Tree document)  
This Chinese native is often found planted by Buddhist temples, hence its common name. It takes about 10 to 14 years to flower.

*Platycladus orientalis* – oriental arborvitae (flanking the steps that lead down to the Compartment Gardens)  
This is slow growing conifer is valued for its yellow tinged foliage.

*Prunus x yedoensis* – Yoshino cherry (two old specimens can be found growing behind the yellow borders)  
The pure white flowers are slightly fragrant. This cherry blooms before the foliage appears.

*Taxodium distichum* – bald cypress (located near the base of the Open Air Theatre steps) Native to southeastern United States, it is one of the few conifers that shed their needles in the fall. The soft needles turn a russet orange before dropping.

# The Italian Water Garden

## Introduction

The Italian Water Garden reflects Pierre du Pont's love of beauty and nature, and his fascination with technology. The Garden captures his desire to emulate the great gardens he visited in Europe, while the impressive fountain displays he experienced at the 1876 Centennial Exposition and the 1893 World's Columbian Exposition helped provide the inspiration to create his own masterpiece. The setting of the Italian Water Garden is unlike any other place at Longwood. The elegance of the landscape in contrast with the blue tiled pools, along with the sounds of the fountains evokes a sense of tranquility. Yet, the extravagant display of 600 different fountain jets is as dramatic as many of the fountain gardens Pierre visited in Europe. For guests strolling through the east end of Longwood, the Italian Water Garden subtly surprises with its beauty and grandeur.

## Highlights

- The Italian Water Garden was designed and engineered by Pierre du Pont, and constructed between 1925 -27. Pierre called this garden 'The Water Garden'. It was renamed after his death in order to distinguish it from the Main Fountain Garden. The reference to the name 'Italian' is because of the ornamental sculpture style found along the façade of the niche wall as well as throughout the garden.
- Inspired by a visit in 1913 to the water garden at the Villa Gamberaia outside Florence, Italy, Pierre most likely consulted one of the garden books in his collection for the dimensions of his plan. He wrote 50 pages of hydraulic calculations while designing the pools and jet alignment.
- The Italian Water Garden consists of six pools, 12 pedestal basins bordering both sides of the garden, a water staircase and one large and two smaller waterfalls. The Sylvan Fountain, located in Peirce's Park, is also tied into the same hydraulic system.
- There are 600 fountain jets featured in the blue-tiled pools, pedestal basins and Sylvan Fountain. The highest spray of water reaches 40 feet in height, and this jet is centered in the rear fountain pool. .
- In designing the Italian Water Garden, Pierre du Pont took into account visual foreshortening. By extending the length of the rear pair of rectangular pools 14 feet, all four pools appear proportionately equal when viewed from the terrace above the garden.
- One of the most distinctive elements of the Italian Water Garden is the cascading water staircase on the west side of the terrace.
- The beautiful trees that frame the Italian Water Garden are little leaf lindens (*Tilia cordata*). They are specially pruned in a fashion known as 'pollarding'. The lindens are planted in perfect formal alignment.
- The fountains are shut off in mid-October, mainly due to leaves falling and clogging the filtration system. The pools are covered for winter. The fountains are turned back on in mid-May.

# The Italian Water Garden

## Practical Tips

### Logistics

- Walk around the Italian Water Garden and check to see if there are any blocked walkways before sending guests down any of the nearby paths.
- If the fountains are not operating or stop running while on your shift, and there is no warning that they were to be turned off for a certain period of time, please use your radio to contact a GSA and let them know the fountains are not functioning.
- Restrooms are located along the trees, past Canopy Cathedral and south of the Italian Water Gardens observation terrace. A drinking fountain can be found at the restrooms, as well as one on the observation terrace.
- The observation terrace is a perfect spot for photo opportunities. Wait for the tallest fountain to shoot 40 feet high, for a full effect.
- Caution guests especially ones with young children, to be careful of the water's edge at the Large Lake. Strollers have been known to quietly roll into the water.
- The closest shelter during a Severe Weather Alert is the Italian Water Garden Bathrooms, or Peirce-du Pont House and Garage. Please note the Canopy Cathedral Treehouse is not a safe shelter.

### Way finding for the Guest – based on guest interest you can suggest the following

- Longwood Gardens has more fountains than any other public garden in the country. For those interested in fountain displays, encourage guests to visit the Open Air Theatre (5-minute shows run daily at 10:00 and 11:00 am, 12:00, 1:00, 2:00, 3:00, 4:00, 5:00 & 5:55 pm. Also, direct them to our website to learn about the Main Fountain Garden Revitalization project – *New Heights*.
- When engaging guests on the observation terrace, you can help guide them to explore the different paths in Peirce's Woods, visit Canopy Cathedral and the Love Temple on the west side of the Large Lake, which was donated to Longwood Gardens in 1967. Also, you can direct them to the Meadow Garden Hourglass Lake Pavilion entrance.
- Encourage guests to stroll down the side of the Italian Water Garden and take a moment to enjoy the setting and tranquil sounds of the fountains.
- For the fountain enthusiast and anyone interested in learning more about the history of Longwood Gardens, a visit through the Heritage Exhibit at the Peirce du Pont House is well worth the stop.
- Invite guests to come back when tours are offered down on the lawn of the Italian Water Garden. Insider tours are listed on the website. There is a small fee for these tours.

## Interpretive Tips

### Precision in Design and Display

- Have guests look onto the Italian Water Garden, and ask them if they notice something not entirely symmetrical. After a moment, explain how the rear rectangular pools are 14

# The Italian Water Garden

feet longer than the pair in the foreground. Pierre du Pont took into account a foreshortening perspective resulting from gazing down on the extended Garden landscape. In order to create the illusion of all pools being the same size, the two background pools needed to be lengthened. Encourage guests to walk along the side path and they will clearly see the difference.

- Point out to guests that the landscape surrounding the Italian Water Garden is absent of flowering plants. Pierre du Pont intentionally created this garden to showcase the fountains. Talk about how the rich greens of the grass and ivy, in combination with the blue-tiled pools enhances the beauty of the fountain display.
- Discuss how attention to detail was essential to Pierre du Pont. Two examples you can point out to guests are the perfect alignment of the fountain jets, and the two paralleling rows of little leaf lindens which help create a sense of enclosure in the garden.

## The Fountains and Hydraulics

- Talk about how Pierre's inspiration came from the water garden he visited at the Villa Gamberaia, near Florence, Italy, but he probably referred to his garden book collection as a resource for his plan.
- Share the story of how Pierre designed the Italian Water Garden. He sketched the design himself, calculated the grading and water circulation for the project, as well as pumping requirements, water flow and number of jets for each fountain. Photos of these drawings and calculations are in the Heritage Exhibit.
- It is naturally assumed the water that flows down the staircase comes from the Large Lake, but the Lake is not the water source for the water staircase or any of the fountains at the Italian Water Garden. You can mention that the water comes from a well in the pump house located at the back of the Italian Water Garden, as well as two reservoirs that provide water to the system.

## History

- Ask guests if they have ever visited the great gardens of Europe, and if the Italian Water Garden evokes any memories of travels abroad? Explain how Pierre du Pont traveled extensively through Italy and France in 1913, and visited over 20 gardens during this trip. One in particular, the Villa Gamberaia, outside Florence, Italy, was the inspiration for Pierre to design his own water garden.
- Ask guests if they have a water feature in their garden. Share the story about the Sylvan Fountain; Alice du Pont liked to entertain her friends on the lawn, and by turning a switch in the house, she could instantly delight her guests with a fountain display, provided by the five jets spraying water.
- Share the story of Pierre du Pont's splendid surprise for his young nieces and nephews. The story is told that at the debut of the Italian Water Garden, Pierre asked for his nieces and nephews to be dressed in their Sunday finest for the purpose of taking a photograph. He had them pose on the steps of the staircase, and at the right moment, the water was turned on and everyone got wet, much to his delight. Their parents however were in on the joke and were well prepared.

# The Italian Water Garden

- The staircase is a great example of the whimsy and fun Pierre had when designing the Water Garden. “He had a lot of fun in designing devices in the garden, things for people to see and come upon in a surprise way”, nephew Chick Laird remembered.
- The niche wall sculptural and fountain features exemplify Pierre’s interest in Italian architecture. Encourage guests to walk down the staircase to have a better look at the ornamentation.
- The Large Lake is a good topic of conversation. Explain that during the mid-1800’s, when Peirce’s Park was at its peak, the Lake was a popular gathering place for guests, and boats were provided for a pleasure outing on the water. Pierre du Pont built a rustic bath house for his family and friends, and apparently the Lake served as a watering hole for the nieces and nephews.

## History of the Italian Water Garden

In 1876, at the age of six, Pierre du Pont discovered a passion for water displays and pumps in action, when his father took him to the 1876 Centennial Exposition in Philadelphia. It was the mechanical and hydraulic equipment that captured his attention. He was most impressed by the great “cataract” or “cascade”, and noted:

“The basin in Machinery Hall was captivating beyond description with its jets of all kinds spurting like mad and without cease...I could have remained all day beside this pool in Machinery Hall”.

In 1893, at the age of 23, Pierre visited the World’s Columbian Exposition in Chicago, where he experienced illuminated fountains. The memories and impressions from these two events along with his extensive travels through Italy and France, visiting many of the greatest gardens in the world, provided the inspiration for future projects he executed at his beloved estate in Kennett Square.

In 1925, an opportunity arose to tour France with the Garden Club of America. An exclusive group of twenty, including Pierre and Alice, visited fifty of the great French chateaux and gardens during a two week tour. They were quite taken, Alice remembered, “with those most formal and imposing ones that owe their impressiveness to the magnificent use of water in a series of immense fountains”.

Pierre returned home with new enthusiasm. For over a decade he had been planning a “water garden” presumably for a wet, marshy area immediately north of the Large Lake. With the design in progress, he reflected back to a garden he had visited more than a decade earlier for visual inspiration, the water garden at the Villa Gamberaia in Florence, Italy.

Careful attention was paid to the hydraulic calculations and the manner in which the jets of water would be arranged. The Villa Gamberaia had only a few fountains, and Pierre would go on to design his water garden with six hundred fountain jets. It is interesting to speculate why Pierre chose arching jets along the sides of the rectangular pools. However, in 1922, Alice visited Spain and wrote Pierre expressing, “We had a marvelously successful day, for the Alhambra and the Generalife Gardens both exceeded my wildest expectations. There were such good ideas in the water line that we could use in the water garden.” The pictures she brought back show the arching jets along the canal at the Generalife Gardens.

# The Italian Water Garden

The water garden was constructed over the next two years, from 1925 – 1927. Since the location was swampy it had to be drained and excavated, and then filled with 10 feet of gravel, sand and topsoil. The cost of the project was approximately \$143,000.00.

Originally, the garden was planted with little leaf lindens (*Tilia cordata*), and boxwood (*Buxus sempervirens* 'Suffruticosa'), along with tall evergreens which created a focal point at the east end. English ivy (*Hedera helix*) bordered the pools.

Limestone copings, pedestal basins, and ornaments carved in Philadelphia and Italy added a distinctively Italian essence. Yet, in its formal enclosed setting and in the impressive number of fountain jets, the garden also reflects the gardens Pierre visited in France.

1954 to Present:

During Pierre du Pont's lifetime, subtle changes were made to the garden, mainly in the evolution of the landscape plantings. The changes were more dramatic after his death in 1954 and through the early 1970s. The pool bottoms were raised, which decreased the water depth. Automation replaced manual control of the fountains and an arched bridge was built above the water staircase. Thomas Church, Landscape architect and consultant for Longwood Gardens, supervised additional alterations.

By the 1980's, the garden was showing the physical stress from age and weather, and in 1989 the decision was made to shut it down and move forward with a plan to completely renovate the Italian Water Garden. A task force of Longwood staff skilled in plumbing, electrical work, horticulture and history was assembled to plan the meticulous rebuilding. The new garden was to be planned to stand for the next 100 years. Simultaneously, the task force considered historic and aesthetic issues. It was decided to use 1954, the year Pierre du Pont died, as the era to which the garden would be visually returned.

The mechanical systems were the most complicated elements to redesign. The hydraulic requirements calculated by Pierre du Pont in 1925 were amazingly accurate. It was agreed to have the various jet combinations change more frequently than the 1950's control mechanism allowed, so guests would see more variety. Wind sensors were installed to cut back on the jet heights when needed and electrical outlets near each pool would allow for lighting the fountains during special occasions. Also, the pump house was enlarged by adding a basement and doubling the size of the sump.

Carved limestone that was removed during the restoration was placed in storage. Much of the sculpture and limestone carvings could be reused, a pleasant surprise since their weathered patina appearance is highly desirable. Most of the new limestone carvings were commissioned in Italy, while the copings and a few carvings were secured in Indiana.

The little leaf lindens (*Tilia cordata*) were retained. The far end of the garden was totally cleared of all plants for construction access. Plants removed during renovation were mainly replaced with native trees, shrubs, and groundcovers.

The Italian Water Garden was officially reopened to great acclaim at Longwood's annual Garden Party on June 1992. Longwood was fortunate to have the financial resources from the foundation set up long ago by Pierre du Pont to rebuild the garden. The final price tag for the renovation was \$4.9 million. The project has been a carefully considered continuation of Pierre du Pont's 'Water Garden', remade with the finest materials and craftsmanship.



# The Italian Water Garden

## Design Intent

The Villa Gamberaia garden served as part of the inspiration in the initial design intent of the Italian Water Garden.

Pierre du Pont stated:

“It is not strictly a copy of the Villa Gamberaia garden. The resemblance is only in the dimensions of the pools on the lower terrace. The view from the upper terrace is in actual measurement the same as that obtained from the Villa Gamberaia garden.”

As much as the architecture reflects that garden and Italianism, there is a prominent French influence to the setting. The two perfectly aligned rows of linden trees, which help create a sense of an enclosed space, are reminiscent of French 17<sup>th</sup> and 18<sup>th</sup> century gardens which contain garden “rooms” known as bosquets. Typical trees used for bosquets were often little leaf lindens. Bosquets were unfamiliar in American gardens until the Beaux-Arts movement, and some could argue that Pierre’s Italian Water Garden is more heavily influenced by the Beaux-Arts movement than by either Italian or French garden style. Either way, the Italian Water Garden with its sculptural ornamentation, formal setting, and hundreds of fountain jets, is more a reflection of Pierre du Pont than any historical style. It ranks as one of his loveliest garden creations.

## Features of the Italian Water Garden

### The Fountain Pools and Basins

- There are 600 water jets that recirculate 4,500 gallons of water per minute, and 18 fountains or pools of water:
- 12 side fountains with 25 jets each
- 4 rectangular pools and the circular fountain, with more than 300 jets
- The rear fountain pool, at the north end of the garden, the frogs, and the Sylvan Fountain.

Note: Several of the stone frog fountainheads were replaced during the renovation. A stone frog replica from the 1960s is on display in the Heritage Exhibit.

### Observation Terrace and the Niche Wall

- The observation terrace is generally the first place guests view the Italian Water Garden. It is from this vantage point that Pierre intended his guests to observe the elegant beauty of the blue-tiled fountain pools in contrast with the lush green lawn and trees.
- The elevation of the terrace was also the reason Pierre needed to lengthen the two rear rectangular pools 14 feet, in order for the eye to perceive the garden and pools as perfectly balanced and symmetrical.
- The niche wall below the observation terrace is decorated with ornate sculpture, moss-covered fountains, large terracotta urns and an ivy-draped trellis. Two original large arched doors with heavy iron hinges help give balance to the appearance of the wall and serve as entrances into storage rooms.

# The Italian Water Garden

## Sculpture

- Throughout the Italian Water Garden, sculpture of stone vases as well as baskets of fruit and seashells can be found in and around the corners of the pools.
- The inclusion of the frogs that surround the far pool and shoot water from their mouths add a whimsical touch to this otherwise formal environment.
- Gargoyle style fountain heads are featured along the side walls of the lawn space below each of the pedestal basins and spill into small basins.
- The cherub statue on the east side of the niche wall is the exception to the lack of human figured statuary in the garden. It is the remainder of a pair of cherubs that were given as a gift from F. Lamot Belin. Early photos show the pair at the bottom of the staircase. By the mid 1930's they were placed in the Niche Wall display. This cherub is original. What caused the other cherub to be "cast out from paradise" is not known.

## The Water Staircase

- One of the most intriguing features is the water staircase situated on the north side of the observation terrace. It is especially unusual since water flows out from an upper tread as if to surprise the unwary climber.
- A traditional staircase is situated opposite, and keeps the appearance balanced.

## The Lawn

- One groundskeeper maintains the lawn at the Italian Water Garden.
- The very lush lawn is a mix of tall fescue cultivars. Several different cultivars are chosen to resist disease and pest issues that could completely destroy the appearance of the lawn. By using more than one cultivar the groundskeeper has a better chance of treating and eliminating a potential issue which might impact just one specific cultivar. The selected cultivars are: 45% Rebel Exeda Turf Type Tall Fescue, 45% Rebel Sentry Turf Type Fall Fescue and 10% Tuckahoe Turf Bluegrass Blend.
- The lawn at the Italian Water Garden is the most challenging outdoor lawn to maintain because of the humidity and drainage issues. Since the most current renovation and resodding of the lawn in January 2009, the turf has much better drainage. Moisture control and good drainage are essential for a healthy turf.
- The lawn at the Italian Water Garden is the last area to green-up in the spring. This is because the base consists of 80% sand and 20% of organic material. The sand is required for good drainage, but it delays the grass from greening, due to the soil temperature.
- The grass is kept at three inches, and is mowed once a week in the high season. An organic growth hormone regulator is applied to the lawn and helps to cut down on the amount of mowing and prevents stress on the turf.
- The Italian Water Garden is broken into seven different irrigation zones. Moisture sensors found in different areas in each zone monitor how much water the lawn requires. The entire lawn is on an irrigation system. Nozzles are buried in the ground and pop up out of the ground when irrigation occurs.
- Due to how easily the soil is compacted when there is too much traffic on the lawn, it was determined that the Italian Water Garden would remain off-limits to guests indefinitely. However, guests interested in seeing the Italian Water Garden up close can sign up for an Insider tour of the garden. Check the website for the days this tour is available.

# The Italian Water Garden

## Pump House and Mechanics

- The pump house for the Italian Water Garden is located at the rear end of the garden. There are nine display pumps and two for the backwash system. A 32-foot well, one of the two reservoirs, the water treatment system and the electrical room are all found in the pump house. Some pumps run one display, some run two and one pump runs three displays. In season, the pumps run continuously, daily.
- The pump house reservoir holds 15,700 gallons of water. Another reservoir, west of the pump house and known as the 'hill reservoir' holds 44,800 gallons of water. In total, they supply the Italian Water Garden with 60,500 gallons of water.
- The system recirculates 4,500 gallons of water per minute through 600 fountain jets.
- The tallest jet can shoot 40 feet into the air. Most of the pumps are connected to the computerized wind sensor system which will open a bypass valve to lower displays when wind is high. In the event of gusty winds, it will reduce the height of the main fountain's 40-foot jet by four, ten or 15 feet before turning off entirely. When wind speeds decrease, the pumps automatically resume operation.
- Once water runs through the filtration system, it is recirculated through the display pumps. Backwashed water is treated and filtered as well, before it is discharged into the Hour Glass Lake, which is located north of the pump house.
- The fountains are shut off in mid-October, mainly due to leaves falling and clogging the filtration system. The pools are covered for winter. The fountains are turned back on in mid-May.
- The Sylvan Fountain runs on the same system as the Italian Water Garden. Water is pumped up to feed the five fountain jets, and then it flows down the waterfall and towards the pump house. From there the water is pumped out to the fountains.

## Horticulture and Plant Care

- One full time gardener (Kari Getchonis) dedicated to the Italian Water Garden
- One to two seasonal gardeners, usually from mid-spring through mid-autumn
- One student – This can be an intern, a PG, or an international student who rotates through the section for a week at a time- the students change on a weekly basis and there may be a few weeks during the season where there isn't a student assigned.
- Two to three volunteers who work one day a week, mostly weeding and pruning ivy
- The arborists maintain the pruning of the trees, but it is the senior gardener's responsibility to prune out shoots and suckers, with the help of the volunteers. The little leaf lindens require a lot of pruning.
- When there is a foreign plant found in the ivy or other garden beds, the gardeners will remove and replant it in a more desirable location if it is native or of value. Otherwise, such plants are composted.

# The Italian Water Garden

## References

History of the Fountains at Longwood; Colvin Randall <http://udspace.udel.edu/handle/19716/2917>

Longwood Gardens; 100 Years of Garden Splendor; Colvin Randall, 2005

Renaissance of an Italian Water Garden, *Rebuilding an Aquatic Masterpiece at Longwood Gardens*; Colvin Randall

The Early Flower Gardens of Longwood, Betsey A. Ney, MS thesis, 1988

A Man and His Garden. George E. Thompson, Sr. 1976

Main Fountain Garden Website, New Heights

# Peirce's Woods

## Introduction

Peirce's Woods and Peirce's Park are the heart of the history and heritage of Longwood Gardens. Named in honor of the family who first developed this land, Peirce's Woods is an artistic interpretation of woodland forest showcasing plants native to the eastern United States.

This seven acre oasis is a year-round woodland garden that displays the most ornamental characteristics of the eastern deciduous forest. Strong vertical lines of woodland tree trunks play against horizontal drifts of herbaceous groundcovers, and lead the eye across the sloping landscape. Mature oaks, ashes, maples, and tulip-trees tower over flowering understory trees. Beautifully designed and highly orchestrated, this Garden peaks in the spring when waves of native shrubs and ground covers put on a spectacular show, and again in the fall when the woods fill with color.

In Peirce's Woods and Peirce's Park, the historic tree collection has evolved into a carefully created woodland display garden that reflects Longwood's mission of excellent horticultural design and display.

## Highlights

- Peirce's Woods is named after the Peirce family who settled and farmed this land and created one of the earliest arboretums in the country, known as Peirce's Park.
- Peirce's Woods and Park both contain magnificent tree specimens; some of which date back to the late 1700's.
- Peirce's Woods encompasses a seven acre wooded area, bordered by Peirce's Park to the north, Flower Garden Walk on the west, the Large Lake to the east and Flower Garden Drive on the south edge. Flowering native shrubs and ornamental trees create borders that separate spaces into a series of nine separate "rooms".
- The present day Peirce's Woods was designed in 1995, by landscape architect and artist, W. Gary Smith. Considered an "abstraction of a native landscape", with its bold sweeps of single species and strong vertical accents created by the mature trees, Peirce's Woods is intended to be a gateway to inspiring people to garden with native plants.
- Peirce's Woods, like any woodland setting, is in constant change as the canopy of trees mature and die. The planting design must constantly be adapted to changing light and successional tree plantings.
- Native spring ephemerals clustered throughout the woodland setting, announce the seasons arrival. (Ephemeral = any of various woodland wildflowers that appear above ground in early spring, flower, produce seed, and go dormant in a short two-month period. This strategy takes advantage of the brief window of time in woodlands when it is warm enough to grow, but before the canopy leafs out, blocking the light).

# Peirce's Woods

- The beauty of native woodland wildflowers is at the height of bloom in Peirce's Woods in spring, with a palette of white, purple and muted pinks. Summer is a time when shades of green foliage and texture dominate in the woodland. Autumn appears in a blaze of leaf colors, before the bare trees of winter reveal the bones of the forest.
- Care of the trees is of utmost importance. When Peirce's Woods design was implemented in the 1990's with new paved paths, the irrigation line ditches were hand dug to protect the root systems of mature trees and root systems.
- In 1995, a team of Longwood gardeners went to the Smoky Mountains to collect more than 10,000 plants being threatened by a North Carolina highway construction project. Many of these refugees are now at home in Peirce's Woods

## Interpretive Tips

### Logistics

Be familiar with the different paths and where they lead in Peirce's Woods. This is most important for guests in wheelchairs and scooters.

Stroll through the different paths to be sure they are all open to the public, and when doing look for plants you can highlight that might be exhibiting an attractive feature.

### Interpretive props:

Seasonal flipbook

Plant flipbook

Tree and Bark flipbook

Plant directory

### Wayfinding for the Guest – based on the guest interest you can suggest the following:

- The most direct and flat path leading to the Italian Water Garden is the path that winds around the Love Temple and Large Lake. This is the best path for guests on scooters or in wheelchairs.
- Water fountains can be found at Peirce's Woods Plaza by the hornbeam hedge, along the south path from the Peirce DuPont House to the entrance of Peirce's Park and at the Italian Water Garden.
- The closest restrooms are located behind the Open Air Theatre. If heading towards the Italian Water Garden, guests can use the restrooms by the Canopy Cathedral. For guests going to the Peirce du Pont House or Bird House treehouse, the Terrace Restaurant, restrooms are most convenient.

# Peirce's Woods

## Interpretive Stories and Tips

- Encourage guests to look up and admire the beauty of the historic trees and share with them that they represent the bones, as well as a strong vertical design element, of a woodland forest. Talk about how many of the trees were around during the Civil War era, and many were planted in the late 18th century.
- Share with guests how the different textures of bark, tree shape and canopy can help identify trees. Peirce's Woods is a good resource when choosing trees for the home garden and woodland landscape. \*Use the bark flipbook to illustrate this and have them touch the bark of nearby trees.
- For first time visitors, encourage them to come back and take in spring in Peirce's Woods. When the purple sweeps of creeping phlox (*Phlox stolonifera*), come into bloom, it is one of the most photographed places at Longwood. It's also the signal that this woodland forest is alive with native wildflowers.
- Ask guests who are into gardening if they grow native plants or have considered landscaping with native plants. Gardener tips include starting in a small area. Plant beds of native species close together. They will fill in and spread more rapidly. A smaller garden space is also easier to maintain.
- Discuss with guests the benefits of growing native plants. It is better for wildlife and the environment. Exotic plants have the potential to become invasive and are less likely to support our native wildlife.
- Point out to guests the impact plants can have when used in mass. Use ferns as an example, or a grouping of *Heuchera*. Native plants can be a great alternative to growing a lawn, especially in shaded areas.
- Share the story of the dawn redwood tree as guest admire this beautiful specimen along the path near the west side of the lake. These trees were thought to be extinct, but were rediscovered on a plant exploration trip in the 1940's. In 1947, the Arnold Arboretum in Boston, MA, financed a Chinese expedition to collect seeds. Pierre du Pont was probably one of the first recipients. The *Metasequoia* specimens at Longwood are some of the oldest dawn redwoods introduced in North America.
- Guests might ask about the notched tree stumps in Peirce's Woods. The gardeners use the notched tree stump method since it helps the stump decompose more quickly. The type of notching is referred to as a "coronet cut". We also have two tall tree trunks that have been left for aesthetic and ecological reasons: to preserve the vertical structure in the design of the garden, as well as provide habitat and food source for animal species.
- Discuss the story of Indian Hannah when you are near the wooden cross located east of the Sylvan Fountain, in Peirce's Woods. Guests and especially young might be curious as to where it is located.

## Remembering Indian Hanna

Indian Hannah (1730-1802) was born in a cabin on nearby land (Webb Farm), that later became part of Longwood Gardens. She is memorialized as one of the last Lenni Lenape in Chester County, PA, when she died in neighboring Embreeville. In a manner befitting Victorian traditions, Quaker George W. Peirce (1814-1880), a descendant of the original owner

# Peirce's Woods

of this area of the Longwood property, paid respect to Indian Hanna by fashioning a memorial "grave" in these woods and marking it with a simple wooden cross. Later, Gardens founder Pierre S. du Pont built a small replacement in this same location similar to the version you see on display today.

To learn more about the story of Indian Hanna or the Gardens' history, visit our Heritage Exhibition located in the Peirce-du Pont House.

## Seasonal Tips

### Spring

- It is really important to stress to guests to stay on the paths in Peirce's Woods. Politely explain why they shouldn't walk into any garden planting areas. The delicate new growth on spring wildflowers can be hard to see. Walking in the beds at any time of the year can compromise fragile plants whether dormant or growing. The least bit of trauma or foot traffic can send a plant to its demise
- Encourage guests to stroll the path along the Sylvan Fountain, and down the steps down to the Italian Water Garden. Here, they will see a beautiful display of trillium in bloom.
- Point out the jack-in-the-pulpits (*Arisaema triphyllum*), and the mayapples (*Podophyllum peltatum*), in early spring. Encourage guests to look for these native ephemerals growing in their local woodland areas. Wildflowers should always be left undisturbed.

### Summer

- Show guests, the large-leaved magnolia (*Magnolia macrophylla*), located down the slope from the Sylvan Fountain. It is a deciduous native tree that has the largest simple leaf and single flower of any plant in North America. Its long leaf has a tropical appearance. This tree blooms in May.
- Encourage guests to walk along the path by the Love Temple, especially in June and early July when they can experience the bottlebrush buckeye (*Aesculus parviflora*), in its glory, along with smooth hydrangea (*Hydrangea arborescences*), and delicate red and yellow flowers of the Indian-pink (*Spigelia marilandica*). The Love Temple is a great place for a photograph.
- In the north edge of the woods, known as Beech Grove and Sweet Birch Walk guests can listen to the cools sounds of the Sylvan Fountain while admiring another grouping of bottlebrush buckeye (*Aesculus parviflora*), and the white wands of black cohosh (*Actaea racemosa*), beginning to rise above the delicate foliage. They can also go hunting for Indian Hannah's cross marker, located in the wooded area east of the Fountain.
- Discuss with guests how texture can carry a woodland summer garden. Summer is the quiet time in Peirce's Woods with not a lot in bloom, but it's a good time to observe different green foliage colors and textures of the native plants. Since many perennials tend to flower for a short period, foliage and texture can be equally as important when





# Peirce's Woods

choosing plants for the garden. The summer woodland garden can also be a place where the eye can relax in the shades of green.

## Autumn

- As summer nears an end and cooler autumn days preside, a bright spot is the South Woods Edge. The red and blue spikes of lobelia meander through the 'Prairie Sentinel' bald cypresses. As they start to fade, the needles of the Prairie Sentinels gradually turn a gorgeous orange. Sweeps of the yellow foliage clethra (sweet pepper bush), contrast with the dramatic reds of Virginia sweet spire and burgundy viburnums. Also, the golden-rod and purple asters are ablaze with color.

See the plant lists and images for more facts to share on any of these plants.

## History

### Past

In 1798, Joshua and Samuel Peirce began collecting and planting trees, creating what would eventually become one of the first arboretums in the country; Peirce's Park. By the mid-19th century, George Washington Peirce further improved the landscape, maintaining the arboretum as a pleasure ground and providing rowboats for use on the Lake. He also created simple paths that meandered under the wooded canopy, taking guests from the house to the lake. George Washington welcomed the public to enjoy what had come to be known as Peirce's Park.

George Washington Peirce died in 1880, and the property gradually fell into decline until it was sold in 1905. In the following year, the property was purchased by an individual who planned to sell the rights to cut down the trees and sell the lumber. Shortly after this agreement, Pierre du Pont visited the property, during which time he purchased the farm with the primary purpose of saving *"the collection of old trees which had been accumulated by the Peirce family over a period of more than one hundred years, many of extraordinary growth and striking appearance"*. (Pierre S. du Pont "Memorandum in Regard to Purchase and Maintenance of the Longwood Estate" as cited by Frederick Edward Roberts Horticulture at Peirce's Park 1798-1905)

Pierre immediately began efforts to recapture the scenic parkland that once characterized Peirce's Park. He was quoted to say *"no tree dead or alive, is to be removed or trimmed, unless by special permission of the owner."* For the next fifty years Pierre continued to augment the landscape surrounding the house, and enhanced the appearance of his farm by creating formal and agricultural spaces. However, through all the improvements, Pierre du Pont continued to retain and preserve the historic and naturalistic character of Peirce's Park and Woods.

In 1955, Dr. Russell Seibert became the first director of Longwood, and it was decided by the Board of Trustees to *"transform the private estate into an internationally recognized horticultural display."* In the late 1950's, efforts were undertaken to improve the horticultural quality of Peirce's Park and Peirce's Woods. An ornamental understory was added to the wooded areas. Much of the plantings focused on adding a layer of exotic and native rhododendrons and azaleas.

In the following decade and as a result of the plant explorations occurring through the Research department at Longwood, Peirce's Woods was used to display plants that might be found in "collectors' gardens". Most of the "collector's garden" plantings were removed in the early 1990's, but there are some trees and shrubs that still exist. The dawn redwoods, *Metasequoia glyptostroboides*, are an example.

# Peirce's Woods

## Present

Modern-day interpretation of the Woods began to evolve when Fred Roberts became director of Longwood in 1984. He saw the need for a redesign that would honor the historic trees, support the preservation of native plants, and create a dynamic visitor experience that was in keeping with Longwood's role as a premier public horticultural display garden.

In 1993, landscape architect and artist W. Gary Smith was chosen to lead the design project. His work can be seen at other area public gardens, including the Stopford Family Meadow Maze at Tyler Arboretum and the present Enchanted Woods children's garden at Winterthur Museum and Garden.

## **Design Intent**

When planning the garden, Smith and Longwood staff members visited the Smoky Mountains and native plant nurseries in the Appalachians to look for design ideas and plants. The enormous drifts of single plant species were design revelations because they made such bold statements. Smith felt that this grand scale would appeal to visitors: *"Lots of people associate native plants with environmental education. But we want to inspire an appreciation for the art of the woodland. The point is to get people turned on to the beauty of native plants. The plants were to be used as important design elements in their own right."*

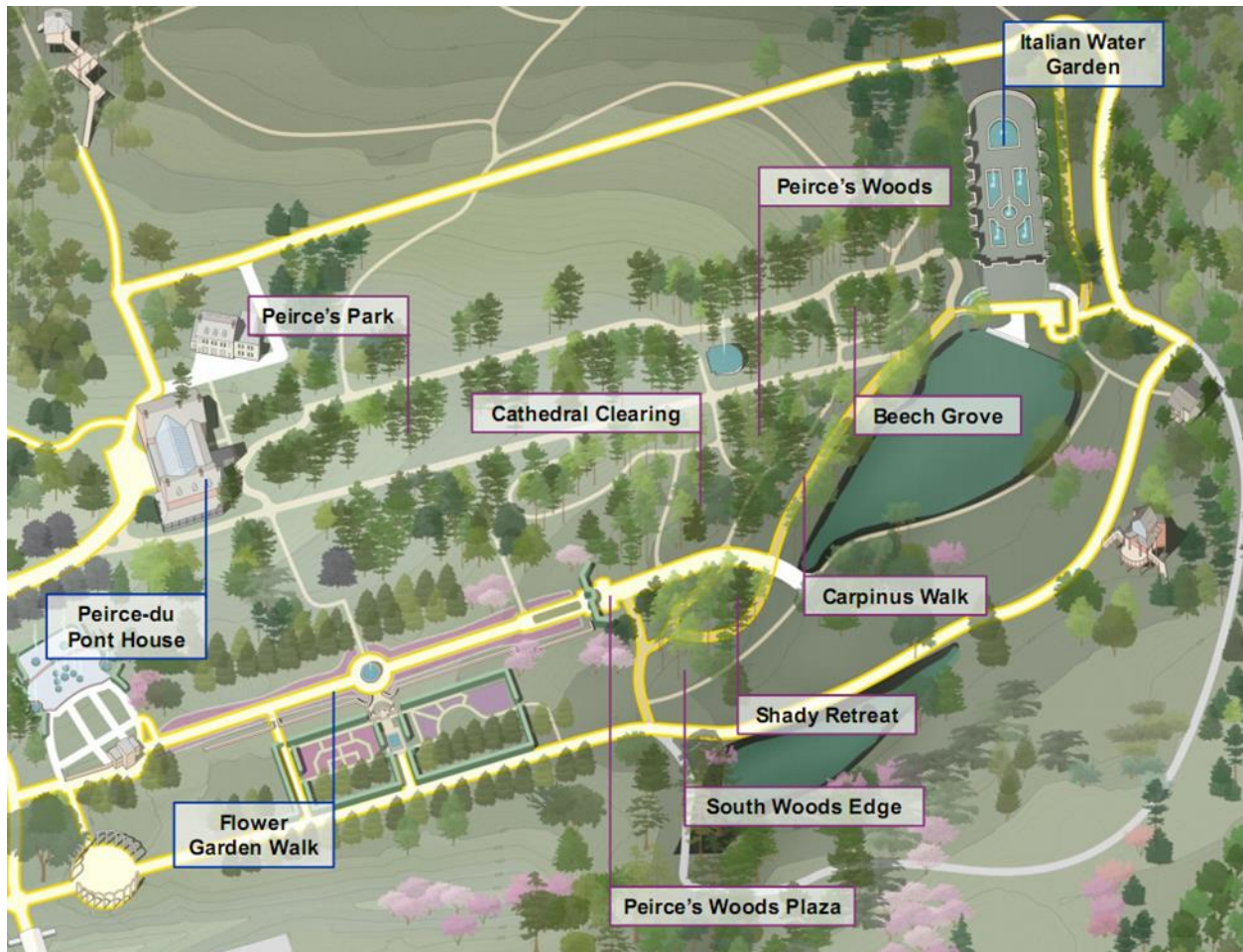
Smith's painterly appreciation for color reveals his dual callings of artist and landscape designer. He noted that his Peirce's Woods design *"began with paintings and drawings inspired by the existing conditions of the site. The design was conceived as a cinematic progression of big pictorial events."* These two-dimensional visions helped Smith achieve his goal of *"encouraging a healthy relationship with nature. Peirce's Woods does that by focusing on the beauty of native plants in a native forest setting."*

Throughout the transformation of Peirce's Woods, Longwood was intent on saving the surviving tree collection, including the few exotic trees. They went to the extraordinary effort of hand digging paths and irrigation line ditches to protect the mature trees and root systems.

## **Features of Peirce's Woods - A Sequence of Spaces**

The design for Peirce's Woods takes visitors on a journey through nine different "rooms" or spaces that encompass distinct woodland habitats ranging from ridge-top woods to moist lowlands. The official entrance is at the east end of the Flower Garden Walk.

# Peirce's Woods



**Peirce's Woods Plaza** - is the entry point and transitional area. It allows guests to "switch gears" as they exit the bright, colorful, formal Flower Garden Walk and into the green canopy of the woods. The plaza combines formal and informal elements. Avondale stone, a local material, surrounds the brick patio which visually ties it to the brick walk of Flower Garden Walk. The containers showcase sun loving plants as it is a bright area, and sweeps of oakleaf hydrangea (*Hydrangea quercifolia*) and other shrubs border the edge of the plaza.

**Cathedral Clearing** - is considered the central area of Peirce's Woods. The arching canopy of trees are reminiscent of the central nave in a Gothic cathedral, hence its name. The strong horizontal plantings contrast the vertical lines created by the trunks of the mature oaks, maples and tulip trees. Losses of old trees from the canopy have reduced some of the shade loving ephemerals, creating opportunities to expand the original woodland plant palette to incorporate more sun tolerant natives while the canopy is reestablished. Currently, more plants offer fall interest, like the tufted hair grass (*Deschampsia cespitosa*), and bluebird aster (*Aster laevis* 'Bluebird'). In spring, purple creeping phlox, (*Phlox stolonifera*), cover the Clearing's floor and announce spring has sprung!

**Shady Retreat** features Carolina silverbells (*Halesia carolina*). The lower path bordering Shady Retreat is lined with silverbell trees which are being trained to arch over the walkway. They are gradually forming a naturalistic tunnel, which is quite beautiful to walk under in the spring when the trees are in full bloom. Native Pinxterbloom azaleas (*Rhododendron periclymenoides*), and Piedmont azaleas (*Rhododendron canescens*), bloom in May.

# Peirce's Woods

**Carpinus Walk** The American hornbeams (*Carpinus caroliniana*), with their silvery and sinewy tree trunks, arch over the walk and create a rhythm of spaces for guests strolling down this path that borders the Large Lake. As the trees have matured they have gradually blocked out more and more light, and as a result the azaleas that once bloomed along the path are being transplanted to more sun infused areas. A tapestry of fern species has been planted to highlight the smooth, muscular tree trunks.

**Azalea Glen** Native azaleas are a featured plant group in Peirce's Woods. The entire garden includes more than 30 different cultivars and varieties. The Azalea Glen highlights azaleas that bloom in progression from white to pink to deep red. Sturdy Christmas ferns combined with lacy maidenhair ferns create a textural blend of dark and light greens on the Glens floor.

**Waterfalls** the uphill area along the path to the Large Lake Originally, there was a large sweep of coralbells and foamflower growing as a ground cover. In 2011, weather issues created the ideal growing conditions for harmful soil fungi, which wiped out the entire sweep. To prevent such a failure from occurring again this planting was replaced with more diverse native plant species. Recently, sedges were planted that serpentine from one side of the path to the other, leading the eye along and unifying the design. Ninebark 'Diablo' (*Physocarpus opulifolius*), and other dark foliage native plants help provide season long interest.

**Beech Grove and Sweet Birch Walk** form the north edge of the Woods. The young beech grove will eventually grow up to 75-100 feet with an understory of Virginia bluebells, columbines and ferns.

**Rhododendron Rooms** this area is hidden behind the tree boxwood hedge bordering the Flower Garden Walk. Garden nooks furnished with benches offer places to sit secluded from the main pathways. Masses of hybrid rhododendrons create year-round walls of green that bloom in late spring.

**South Woods Edge** is between the Flower Garden Drive and Peirce's Woods Plaza. The area is moist, and was designed for fall and winter interest. The terraced stream adds the sound of falling water to the area and is a haven for tadpoles and frogs. The small Spring House was built in the 1960's when the stream was first added. Eye catching Cardinal flower (*Lobelia cardinalis*), begins in mid-July, followed by great blue lobelia (*Lobelia siphilitica*). Both species drift through the grove of 'Prairie Sentinel' pond cypress (*Taxodium distichum* var. *imbricarium*), which is the most prominent feature in South Woods Edge. In Autumn, yellow goldenrod and purple asters **contrast** dramatically against each other. Horizontal sweeps of Red/Burgundy Itea and Viburnum **contrast** with yellow Clethra; viewed through a vertical screen of burnt orange pond cypress trees. Come winter yellow-twig dogwood is **contrasted** by the brilliant red fruit of winterberry holly.

## Operations, Horticulture and Plant Care

### Peirce's Woods and Peirce's Park Staff

1 full time gardener

1 part time gardener

15 volunteers

# Peirce's Woods

1 team weeds every other week for 2.5 hours

2 plant labelers

1 photographer

Occasionally, students will work in Peirce's Woods, but never more than one at a time

## Horticulture and Plant Care

There is a design intent manual for Peirce's Woods. Gardeners can refer to it when making changes and maintaining the plantings. A Longwood Landscape Committee must approve any changes

## Care of the trees

The senior gardener is responsible for all maintenance of the trees that can be reached from the ground. The arborists take care of the health of the trees and any maintenance that is out of the gardener's reach. When there is a loss of a historic tree, Longwood staff attempts to replace them with cloned specimens of the original.

## Wildlife

Wildlife like deer, geese and beavers have caused problems in Peirce's Woods over the years, but the biggest challenge the gardeners face is earthworms! Earthworms are non-native to the United States except in the Deep South. In woodland environments earthworms rapidly chew through the protective leaf litter layer and topsoil, causing soil erosion and nutrient leaching, resulting in destruction of habitat for animals such as salamanders, and loss of biodiversity. Earthworms do not favor oak leaves, so we are increasing the number of oaks planted in Peirce's Woods and also adding oak leaves to areas where earth worm populations are particularly high.

## Weeds

One of the most troublesome spring weeds found in Peirce's Woods is Hairy Bittercress. It goes to seed very quickly and it shoots seeds long distances. Oriental bittersweet is the most significant woody weed, growing quickly and strangling shrubs and trees. Later in the season, Canadian thistle and stilt grass are the most challenging weeds to control. Manual removal of these weeds controls their spread.

Certain areas of Peirce's Woods with poor drainage have pathogenic or harmful fungal issues. To combat such challenges, the gardeners worked organic matter into the soil to improve soil structure, and have introduced more plant diversity. Instead of planting monocultures of species which can completely be wiped out by a single pest, landscaping with a combination of plants cuts down on the chances of losing a large display area.

## **References**

From Art to Landscape; Unleashing Creativity in Garden Design: W Gary Smith 2010

Peirce's Woods: An Evolving Beauty; Pandora Young 2013 (Longwood Blog; Behind the Plants)

Peirce's Woods: <http://www.longwoodgardens.org/Plants&Horticulture/PeircesWoods/PeircesWoods> 12/1/05

# Champion Trees of the East Gardens

## **Champion Trees**

In the state of Pennsylvania, there is a registry of the largest specimens of trees known as champion trees. The registry can be found on-line at [www.pabigtrees.com](http://www.pabigtrees.com). In Pennsylvania, both native and exotic tree species are included in the champion tree program. The United States champion tree registry can be found on-line at [www.americanforests.org](http://www.americanforests.org). The U.S. registry only includes native and naturalized species.

Three measurements are taken to determine if the tree is a champion:

- *Circumference* – 1 point per inch. The circumference is measured at 4.5 feet from the base of the plant. Plants on a slope are measured from the midline at 4.5 feet from the base of the tree.
- *Height* – 1 point per foot of height. This can be difficult unless you have the proper equipment. A clinometer, (an instrument that measures vertical slope, usually the angle between the ground or the observer and a tall object, such as a tree a hand level or a range finder in conjunction with a clinometer, is needed to obtain an accurate measurement.)
- *Crown Spread* – ¼ point per foot. The crown spread is the largest point of the tree's spread. This can be paced off on the ground and measured.

The points from these three measurements are totaled for the point value. The tree with the highest points for that particular species is named the champion tree. Co-champion status is awarded to a point value of within 10 points of the champion in the US registry.. On the state level a tree can take a first, second, third, etc..., place ranking.

## **Longwood's Plant Accessioning System**

All trees in Longwood's plant collection have a brass tag attached to the north side of the tree. The brass tag includes invaluable information.

In 1955, Longwood's first taxonomist conducted a property-wide inventory of the plants that existed on the property at the time of Pierre S. du Pont's death. An accessioning system was developed in which each unique type of plant or taxon was assigned an accession number beginning with an 'L'.

Recently, our Curator of Plants determined which of these original 'L' accessions were planted by the Peirce brothers in the 19<sup>th</sup> century. The Plant Records Manager and Peirce's Tree Core Collection Curator have since re-tagged these trees with an accession number starting with 1800. . Note, this is not an exact acquisition date for each tree, but more of a circa of when each individual tree was planted. If possible, when there are propagations (i.e. cuttings), taken from an 1800 accession, the parent's accession number will also be included on the brass tag. It will indicate that these trees too are part of Peirce's Tree collection.

# Champion Trees of the East Gardens

Trees received after 1954 were given accession numbers starting with a date that indicated year of acquisition. The second four digits of the accession number indicate the order in which the accession was generated.

In addition to the accession number as outlined above, the brass tags also include:

- The plant's family name
- The scientific name of the plant
- The common name
- Nativity (if a straight species and not a cultivar)

## List of Champion and Historic Trees in the East Gardens

### Champion Trees by the Open Air Theatre

#### ***Cornus kousa***

#### **Japanese flowering dogwood**

Cow Lot, east side of main path, leading from the Visitor Center

L-0567\*B

Cornaceae

This tree is one of several large specimens planted between 1906 and 1954 by Pierre S. du Pont. Although their exact source is not known, their size and age indicates that they were likely a result of some of the earliest introductions of this species to the United States from Japan around the turn of the 20th century.

#### ***Cunninghamia lanceolata***

#### **China fir Northwest**

side, behind the Open Air Theatre

L-0683\*A

Cupressaceae

This tree was planted by Pierre S. du Pont after the nearby Open Air Theater was completed in the late 1920s. Discovered originally by James Cunningham on the Chinese island of Chusan in 1701, this tree can reach 150 feet (46 m) in the wild. It is the most primitive surviving member of Cupressaceae, the family of plants which includes arborvitae and juniper. The wood is strongly resistant to rot, is impervious to termites, and is easily worked. For millennia it has been popular for the construction of buildings, bridges, ships, lamp posts and furniture in China.

#### ***Styphnolobium japonicum***

#### **Chinese scholar-tree East**

side of Open Air Theatre - at base of the steps

L-0346\*A \*Current name for *Sophora japonica*

Fabaceae

This tree was introduced to France in 1747, and from there to other parts of Europe and to North America. Longwood's champion was purchased in 1928, as a specimen already 35 feet (11m ) tall and 30 feet (9 m) wide at that time. Today, at nearly 85 feet (26 m) in height, it ranks among the tallest examples of this species anywhere.



# Champion Trees of the East Gardens

This Chinese and Korean native is planted near Buddhist temples in the orient. It takes years; at least 10 to 14 to begin flowering and blooms in late spring/early summer. This grand specimen provides filtered shade to the Flower Garden Walk patio.

## ***Ilex opaca* ‘Longwood Gardens’**

## **American holly**

Second Place species in Pennsylvania

East side of the Open Air Theatre

L-1741\*D

Aquifoliaceae – American Native

This woodland evergreen is dioecious, meaning that a male and female tree flowers develop on separate trees, and both are required for adequate pollination and good fruit set. Flowers are small and inconspicuous. They bloom in June and are pollinated by bees. Used for Christmas decorating and as landscape plants.

## **Champion Trees by the Peirce du Pont House**

### ***Magnolia acuminata* ssp. *subcordata* ‘Peirces Park’**

### **cucumber magnolia**

Southwest lawn of the Peirce-du Pont House

1800-2188\*A

Magnoliaceae – American Native

The tree was discovered in 1788 by French explorer Andre Michaux in South Carolina. The Peirce brothers procured this magnolia from Michaux. The yellow cucumber magnolia was the first tree from Longwood to be nominated as a state champion in 1970. The tree has been deemed the largest tree of its kind in Pennsylvania, and was also awarded the largest in the nation. The tree is 100 feet (33 m) tall, and is noted for its flower which blooms in April.

### ***Pseudolarix amabilis***

### **golden-larch**

Terrace lawn area, across from the Conservatory entrance of the Peirce DuPont House

1960-2469\*B

Pinaceae – China

This Chinese species was discovered and introduced into cultivation in Europe by English explorer Robert Fortune in 1854. The state champion at Longwood has reached the height of more than 70 feet (21 m), about half of what trees in their native habitat are capable of attaining.

This plant is a deciduous conifer which means it loses its needles in the fall. The larch bears cones which fall apart when mature. In autumn, the needles turn burnt orange before dropping.



# Champion Trees of the East Gardens

\*A historic tree worth noting:

## ***Franklinia alatamaha***

## **Franklinia**

Fourth largest specimen in Pennsylvania. (The National Champion is located in Wyndmoor, Pennsylvania)

A small grove of these trees are planted on the west side of the Peirce-du Pont House 1976-0424\*A

Theaceae – American Native

Franklinia belongs to the tea family. The camellia-like fragrant flowers bloom in late summer to early fall. The smooth, glossy dark green leaves turn shades of orange, red and purple. This tree is extinct in the wild. It was first discovered by John Bartram in 1765, on an exploratory trip he took to the southern colonies. In the same year, Bartram was appointed Royal Botanist for North America by King George III. Bartram and his son William discovered Franklinia growing in a 2-3 acre tract along the banks of the Altamaha River in southeastern Georgia. Franklinia has never been observed growing in any other place than along the Altamaha River. On a return trip in 1773, William Bartram collected seed from this site and brought it back to the Bartram's Garden in Philadelphia where the tree was successfully grown. In 1803, William Bartram returned to the area to collect more seed, but found no traces of the Franklinia in existence. As a result, it is considered that this tree has been extinct in the wild since 1803, and all plants derive from the seed collected by Bartram in 1773. It is not known why this tree disappeared in the wild. The genus name honors Benjamin Franklin who was a good friend of the Bartram's.

\*A historic tree worth noting:

## ***Ginkgo biloba*** - ginkgo, maidenhair tree - Ginkgoaceae

There are three magnificent specimens growing on the north lawn, in front of the Peirce du Pont House. The ginkgo (1800-1817\*A), next to the cucumber magnolia (*Magnolia acuminata* var. *subcordata* 'Peirce's Park'), is the sixth largest recorded ginkgo in the state of Pennsylvania.

Although today ginkgo is native only to China, fossil records indicate that at one time the ginkgo was a native tree in this region of the world. It is very primitive, and is actually called the 'dinosaur' tree, as geological records prove it grew 150 million years ago on Earth. It is valued for its lovely fan-shaped foliage that turns yellow-gold in fall, and for its various uses in traditional medicine as well as a source of food. The female trees bear the seed that was used to make the supplement *Ginkgo biloba*. Today, extracts of ginkgo leaves are used in making an herbal supplement. The aril (covering surrounding the seed), emits an unpleasant odor when decomposing, but the kernels are edible if cooked.

# Champion Trees of the East Gardens

## Champion Trees by Peirce's Park

### ***Ailanthus altissima***

### **tree of Heaven**

Third largest species in Pennsylvania

South path's edge of Peirce's Park, growing just feet away from a historic hemlock tree L-2850\*A

Simaroubaceae - China

Considered a weed tree, *Ailanthus* is widely disdained in the horticultural world. Commonly known as the Tree of Heaven, it is the tree symbolized in the novel *A Tree Grows in Brooklyn*, written by Betty Smith. It grows well in polluted areas and on disturbed and infertile soils. The tree has been grown extensively in China and other areas of the world as a host plant for the ailanthus silkmoth, a moth involved in silk production. It spreads by seeds and underground roots making it invasive and difficult to control once it is planted.

### ***Betula lenta***

### **cherry birch; sweet birch**

Tied for third place in Pennsylvania

Peirce's Park, on the north side of the south path

1800-0681\*B

Betulaceae - American Native

This was one of the main species planted to create the alleés in the tree park created by Joshua and Samuel Peirce starting around 1798. In the past, this tree was used commercially for the production of oil of wintergreen. Birch sap can be boiled, and was used for making birch beer during colonial times.

\*A historic tree worth noting:

### ***Tsuga canadensis***

Located throughout Peirce's Park

Canada hemlock – Pinaceae – American Native

The Canada hemlock is the state tree of Pennsylvania. It is a beautiful deep green conifer that grows well in shade. This hemlock is not the same plant from which Socrates drank the poisonous substance from. *Tsuga canadensis* has been plagued with wooly adelgid, a destructive pest introduced from eastern Asia that threatens both the Canada hemlock and the Carolina hemlock, *Tsuga caroliniana*. Trees infected can be identified by the egg sacs, which resemble small tufts of cotton clinging to the underside of the tree branches. The trees needles often look more grayish-green verses the deep green of a healthy hemlock.

# Champion Trees of the East Gardens

## Champion Trees on the eastern-most side of the Gardens

### ***Quercus phellos***

### **willow oak**

Second largest species in Pennsylvania

Behind the Love Temple, on the South side of the Large Lake

L-0591\*A

Fagaceae - American Native

This is a fine-textured oak with small leaves and a nice habit. An underused species, it grows well as a street or urban tree. The willow oak grows naturally in Pennsylvania's coastal plain areas, along the Delaware River. It is hard to tell much about where this specimen came from, but it appears to have been planted after 1906.

### ***Betula utilis* var. *jacquemontii***

### **white-barked Himalayan birch**

Outer edge of Flower Garden Drive

1962-1374\*D

Betulaceae - native to Asia

A relatively rare tree in this country, but where it grows natively, it is a lovely tree that stands out for its white bark. It was planted in the 1960s.

### ***Cedrus deodara***

### **Deodar cedar; Himalayan cedar**

Southeast of the Small Lake

1955-0002\*B

Pinaceae - Native to Western Himalayas and Afghanistan.

Difficult to grow in this region, so this is a real gem.

### ***Prunus x yedoensis***

### **Yoshino cherry**

South of the Small Lake, close to fence

1957-1392\*Z

Rosaceae - Native to Japan, Asia

***Quercus acutissima*** - R-12 – (south of the Small Lake, next to the fence) - 1956-0482\*A

sawtooth oak - Fagaceae - Native to Japan, China, Korea, Himalaya.

It grows well in hot, humid weather.

### ***Prunus serrulata***

### **Japanese flowering cherry**

South of the Small Lake, behind carriage shed

1957-1393\*E

Rosaceae - Native to Japan, Asia

Usually a short-lived tree in this country, this is a large specimen. It is one of the most beautiful early spring flowering trees. \*This is the type of cherry tree at the Tidal Basin in Washington, DC.

# Champion Trees of the East Gardens

## ***Taxodium distichum***

## **bald-cypress**

The trees lining Flower Garden Drive and on the west edge of the Small Lake

L-0348\*C

Taxodiaceae - American Native

This is a deciduous conifer planted by the Peirce family and later by Peirre du Pont. In the early 19<sup>th</sup> century, The Peirce's found the tree growing in southern Maryland, while on a plant expedition. Stumps found in the 1930's while the subways were being dug in Philadelphia, proved the bald cypress was native to Pennsylvania before the ice age.

The bald-cypress will grow in swampy areas and will develop 'woody knees' known as pneumatophores, which serve as a respiratory organ. The soft needles turn a russet-orange before dropping in the fall. The northern row of trees on Flower Garden Drive was likely planted by the Peirce's, and the southern row was planted by Mr. du Pont in the late 1940s.

\*A historic tree worth noting:

## ***Metasequoia glyptostroboides***

## **dawn redwood**

Specimens are located between the Large Lake and the Italian Water Garden and also in Peirce's Woods

Cupressaceae – China

This tree was thought to be extinct, but was rediscovered on a plant exploration trip in the 1940's. In 1947, the director of the Arnold Arboretum in Boston, MA, financed a Chinese expedition to collect seeds. Once he obtained the seeds, he dispatched samples. Pierre du Pont was probably one of the first recipients. The *Metasequoia* specimens at Longwood are some of the oldest dawn redwoods introduced in North America, and the second tallest exotic species in Pennsylvania. The tallest tree at Longwood is 134 feet tall. It is not known when these beautiful specimens were planted, but the oldest trees in this region date back to the late 1940's. This is a deciduous conifer that has soft feathery green needles that are burnt orange in the fall. These trees are distinctly pyramidal in habit, buttressed at the base. The bark of established trees turns a rich reddish-brown color. *Metasequoia* means "altered sequoia", or similar to the genus *Sequoia*, or coastal redwood.

Note: The needles and branches of the dawn redwood are opposite one another versus the bald cypress which are alternate. This is a great clue when trying to distinguish the one species from the other.

\*A historic tree worth noting:

## ***Fagus sylvatica***

## **European copper beech**

The copper beeches along the Cow lot are approximately 85 years old. Prior to the beeches this was an *allee* of sugar maples (*Acer saccharum*). One still survives and is located on the upper lawn of the Open Air Theatre. The copper beeches have been afflicted with a fungal disease known as *Phytophthora*. This is a soil borne fungal pathogen. Symptoms can be seen in the oozing of the cankers and dark spots on the bark. Some believe it is brought to the tree by Ambrosia beetles, while others feel the tree is weakened by the fungus first, and then attacked by the beetles. IPM is treating the trees for the disease.

# Plant Production, Research, and Sustainability

Longwood takes ordinary plants and makes them extraordinary. To provide these extraordinary plants we produce many of them in our production facilities. We also grow rare and unusual specimen plants. Longwood's standard of excellence and desire for beautiful and unique displays of specimen plants creates a need for unique display forms and larger scale plants to fit the soaring Conservatory. Our production team is responsible for growing and creating most of these plants and display forms. The production staff is dedicated to quality plant production. They take plants and through exceptional care, pinching and disbudding create huge blooming plants which are all of the highest quality.

## Highlights

- We produce 65% of the plants used for display, 80,000 pots ranging from small peat pots to large topiary standards. In total we display 120,000 pots each year, produced in house and by select commercial producers.
- Our production space comprises 80,000 square feet (two acres) of total greenhouse production space, more than most other public gardens.
- There are an additional 100,000 square feet (2 ½ acres) of field production. This does not include nursery and field grown plants.
- Our research division has introduced more than 130 new cultivars including garden standbys such as New Guinea impatiens or exotics like our gigantic waterplatters.
- We mix our own potting medium and have over 50 different types of specialized potting media.
- Longwood's Integrated Pest Management (IPM) team leads the field in applying IPM techniques to achieve horticultural excellence while preserving high environmental standards.
- Some plants are added into production planning five or more years out , especially when we need something quite large such as our lantana standards.

# Plant Production, Research, and Sustainability

## Interpretive Tips

When guests admire plants and ask where we grow these gorgeous plants, it is a perfect opportunity to talk about our facilities and how the plants are grown.

One talking point is the plant production staff's dedication to excellence. Every plant is a specimen vs. a standard potted plant. The excellence of our displays is directly related to the dedication of the production staff - pinching, disbudding, and tying up each plant. Most commercial growers can't put that time into each plant. Our growers at times will come in after hours to make sure their plants get the best care.

Encourage guests to return for one of our behind the scenes production tours which occur Thursdays through Sundays.

When talking about the size of the plants or blooms, point out that you can't buy plants of this size easily. We grow them to fit the scale of our soaring Conservatory not the average home.

Research – This is a great topic on Flower Garden Walk. Cannas are just one example of research focus plants. Any time you are near a research plant that gives you an opportunity to talk about our leadership in research.

IPM – When guests ask about disease or insects, point out that Longwood uses many low impact treatments such as spraying plants with water or using beneficial insects to keep our plants and environment healthy.  
You can point out the sticky yellow cards which are used to collect and identify insects.

## History

The first production greenhouses were built in 1921 at the west end of the Conservatory during the original construction by Pierre du Pont. The nursery was constructed originally as a temporary production facility in 1956. There have been steady additions of new hoop houses added to the nursery area throughout the years. Research greenhouses north of the Conservatory were added in 1956 and remodeled in 1999 as well also adding nine more state of the art greenhouses. Sophisticated computerized systems in the newer houses mark Longwood Gardens as one of the leading users of technology in growing plants in a public garden.

# Plant Production, Research, and Sustainability

## Production Facilities

Two acres (80,000 square feet) of total greenhouse production space include a nursery, hoop houses, the original estate greenhouses, and nine newer production greenhouses. An additional two and a half acres (100,000 square feet) of field production add more capability.

### Nursery

Sixteen hoop houses (half round, poly covered greenhouses) are used for outdoor bedding plants, propagation, specialty chrysanthemums, and research.

Two and a half acres (100,000 square feet) of field production include chrysanthemums, outdoor bedding plants, replacement ornamental plants, and research plantings

Conservatory Complex – original growing houses and hoop house – There are dedicated areas for plant holding areas for different indoor display areas as well as production of seasonal indoor plantings. It includes five orchid houses and two small offseason waterlily tanks for early plant production and preparation.

### Newest Production Facility

The facility behind our Conservatory contains 30,000 square feet of state- of- the- art production greenhouse space and 5000 square feet of research greenhouses.

In 1999 nine new greenhouses were added behind the Conservatory. Argus computers are used by growers in the range of nine greenhouses, making it possible to produce exquisite plants year round under all conditions. Each greenhouse is equipped with its own computerized system that automatically controls temperature, bench and perimeter heat, snow melters, and devices for cooling and shading. Unlike many production facilities, most of our mechanical systems are located beneath the greenhouses in a complex tunnel system. The production facility includes a soil mixing room and four large cooler rooms for forcing bulbs. The building also houses our research division where they trial new plants and develop new cultivars.

## Production Practices and Techniques

Everything is grown on a specific schedule to ensure plants are produced for display when needed. Of course Mother Nature can interfere with that at times, and despite all efforts from a dedicated staff, plants may bloom too early or too late.

We can produce 65% of the plants used for display – 120,000 pots ranging from small peat pots to large topiary standards. Many large specimen plants are grown which take up a lot of space in the production houses and limit the ability to produce a higher number of plants. Throughout the past decade, a more rapid display turnover also demands more plants and more space.

# Plant Production, Research, and Sustainability

Selecting which plants are grown in house and which are grown by contracted growers depends on the crop and our expertise. Some crops are more easily grown by other growers with the expertise and facility to produce a Longwood quality plant.

A computerized soil mixing system was introduced in 2000; now the growers “dial-up” the desired soil mixture. Over 50 recipes are stored.

Our gardeners want beautiful plants with larger blooms. How do we create these large plants?

1. Pinching off some of the flowers and disbudding some of the branches of a plant forcing all the energy to create fewer, larger flowers.
2. Choosing good cultivars – selecting strong and larger cultivars
3. Good management and plant practices

A number of different techniques are used for propagation of plants, including germinating seeds, rooting cuttings, grafting and micro-propagation, or tissue culture.

## Creating Large Hanging Baskets

There are two main construction techniques:

1. Stainless steel baskets are constructed in two halves by Longwood’s metal shop. They are lined with very wet sphagnum moss and filled with damp planting medium. Each half is planted and allowed to grow, then bolted together.
2. Sphagnum moss baskets are also used. Gardeners push the root balls of plants such as orchids through a metal basket cage which supports them. There is damp sphagnum moss around the outside of the basket, and damp planting medium fills the center. A pot is placed into the top of the basket so that they can water the baskets by filling the empty pot on top. See illustration on the following page.



# Plant Production, Research, and Sustainability

## Sphagnum Moss Hanging Baskets at Longwood Gardens

### Top-Planted Baskets

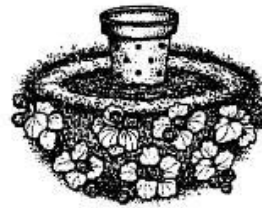


A perforated pot serves as a water reservoir. The wire frame is lined with 2-3" of wet sphagnum moss. The moss is built up the sides and over the rim.

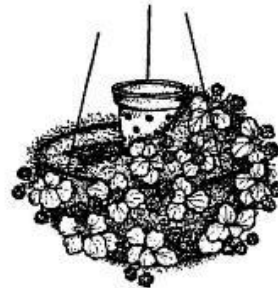


Plants are planted in the soil around the edge of the basket.

### Top and Side-Planted Baskets



Rooted cuttings are planted in the sides of the baskets as the moss and soil are built up.



Continue to plant the sides as you build up the soil and moss around the pot.



The pot acts as a reservoir and distributes water evenly through the ball.

# Plant Production, Research, and Sustainability

## Creating Standards

A standard is a plant which is trained to have a long bare stem and full, shaped top. Standards can take anywhere from one to six years to reach display size. Some standards are grafted but not all. It depends on the plant used.

Grafted plants can be created using a bud graft or slit graft. The graft is rubber-banded in place and covered in Para film. Once the graft takes and new growth starts the gardener lets the stems get to a specific length and then starts pinching and shaping the plant to create the shape they want.

Ungrafted plants are grown to a specified size. Once they reach that size all the branching structure and foliage along the stem is removed to a specific height. Then the upper branches are pinched and shaped to form the topiary top.

## Growing Standards – Plants grown in a stylized tree form

Standard tree forms are plants which may not naturally have a tree form. They are started as cuttings with one straight stem trained to grow up a stake. Any side shoots or flowers are pinched or pruned off without disturbing the apical meristem or top growing point of the stem. Once the single stem plant reaches the desired height the growing point is pinched or pruned off which causes the plant to start to branch. Once the desired height is achieved, the plant is shaped with uniform branching. Both *Allamanda* and *Euphorbia* are fast growing and get to be a display size plant in 2 to 3 years. Heads of standards are uniform in shape and well-proportioned to height. The Standards displayed in the Garden are not in containers. They are dug up in the fall and returned to the Production Greenhouses.

## IPM – Integrated Pest Management

Integrated Pest Management (IPM) is the philosophy and strategy used to promote the health and well-being of all the desirable plants (trees, shrubs, flowers) and the physical plant at Longwood Gardens for over 20 years. Insects, mites, plant diseases, weeds, deer, mice, etc. may threaten our displays. They are called “pests” in this document for discussion. Our program’s goal is not total pest elimination, but instead the successful management of pest populations at levels which are aesthetically acceptable and promote plant/public health.

Longwood's Integrated Pest Management (IPM) team leads the field in applying IPM techniques to achieve horticultural excellence while preserving environmental quality. IPM programs include: implementing innovative pest control measures, optimizing environmental conditions for plants, conducting relevant research to solve pest management problems, and applying the highest standards of pesticide safety.

# Plant Production, Research, and Sustainability

Simple steps like watering foliage to remove insects or using beneficial insects can reduce the need for application of pesticides.

When chemicals are used, our staff uses the highest standards of pesticide safety. We exceed established State and Federal Guidelines regarding pesticide use. We protect our highly trained applicators with Personal Protective Equipment, treating every pesticide as if it was the most toxic. The applicators take measures to isolate the public and other workers from these chemical applications until re-entry in areas of application are considered safe. Any pesticide applications occur after hours when guests are not affected.

## IPM Practices

Longwood Gardens has a rich tradition of utilizing innovative methods and diverse principles to achieve our pest management objectives. Safety is of prime importance for both guest and staff. IPM is a team effort with the IPM staff working closely with the horticulture staff to identify and create treatment plans for different areas. The Gardens are scouted; an IPM plan is developed for each area or crop and then implemented.

## Scouting

The IPM team, which consists of two full time and one part time staff, one intern, and several students, scout garden areas regularly to control insect and pest populations, weeds and disease before they get out of control. They scout the Production facilities, conservatories and outdoor spaces on a regular schedule and are also notified by staff if there is a sudden plant health issue.

The production spaces are scouted by room or crop every few weeks. Plant shipments from Florida are scouted upon arrival, so that new pests are not brought into display or growing spaces. Sticky yellow cards are used to collect and identify insects in many areas of the greenhouses.

The Conservatory spaces are scheduled to be scouted every few weeks depending on the area and plants. IPM staff and interns look closely at plants to take bug counts and look for signs of disease or poor plant health.

The outdoor gardens and natural areas are scouted according to Growing Degree Days. GDD are a measure of heat accumulation used by horticulturists, gardeners, and farmers to predict plant and pest development rates. Longwood uses biophenometers to keep track of GDD. These instruments take multiple samples of air temperatures and calculate the average temperature. This information and historic data is used to determine which insects might be actively hatching, laying eggs, or feeding. It also ties to when plants are coming into bloom. The IPM staff then can direct their scouting search to those insects which will be most likely to be active on a particular crop or in a

# Plant Production, Research, and Sustainability

particular area of the Gardens. For example, Azalea Lace Bug emerges at about 130 GDD, which is around the time that the Saucer magnolia begins blooming. Boxwood leaf miner emerges at about 250 GDD when the eastern redbud is in full bloom.

A report is made to the gardener in charge of that space or garden. A decision is made to do nothing or to take action. The range of care includes taking no action, spraying a plant, using a beneficial, or at times composting the crop of infected plants. It is all dependent on how much the plant or crop can tolerate before it is too severely weakened.

Generally the gardeners responsible for each area or crop do the actual treatments when needed.

## Treatment Options

- Cultural control - rotating infected plants out of display before issue gets too bad
- Watering techniques - many fungal issues are caused by overwatering
- Physical control – getting rid of an infected branch or few plants, washing off pests with water
- Weather – as seasons change pest population may fall
- Biological control – using good bugs to reduce bad bugs. Using biological controls are more costly and time consuming, but much better for the environment. Longwood is working to grow their own beneficial insects such as *Vidalia* beetles and mealy bug destroyers. Example: *Vidalia* beetle eats cottony cushion scale in the Acacia Passage.
- Chemical control – last resort and least toxic, most effective option is always used.

## Plant Selection

Plant Selection also plays a role in limiting use of chemical treatments. Thoughtful planning and layout of the plants in these gardens is the most important ingredient for healthy plants in this area. Preventive measures include: diverse plantings, strong healthy seedlings, disease resistant varieties, proper sunlight, air circulation, and healthy soil. These methods are used to prevent plant disease, rather than deal with pests later.

## Healthy soil

Soil testing is performed so that the appropriate soil amendments are added. Healthy soil is essential for strong, healthy, disease- resistant plants.

# Plant Production, Research, and Sustainability

## **Wildlife**

Longwood pursues a multifaceted approach in all its wildlife management efforts.

### Deer Management

In the fall netting is placed over spring bulbs to discourage deer from stepping in the beds and squirrels from collecting the bulbs. It is removed once the foliage emerges, usually in early March.

Deer fence- In the spring, once the spring bulbs start to grow and show some green, deer fencing is used. The 30 inch tall electric fence (2 wires) is put up every night and taken down in the morning. It is baited with peanut butter. Once deer have been shocked tasting the peanut butter, they then learn to avoid the fencing and hopefully the plants.

To ward off deer, Longwood leases perimeter land to farmers and insures that there is always a field of corn somewhere on the perimeter.

Through a system of stand-hunting and organized drive hunts, the population of deer on the property has been somewhat stabilized over several years. Adjacent properties still harbor large populations of deer which occasionally use the Longwood property.

Success of the program is defined as attaining a goal of healthy forest regeneration and minimal deer browsing damage to the display garden. Deer are also seasonally and permanently fenced out of certain areas in the gardens to minimize damage in those locations. The hunters are all Longwood full-time employees who are licensed hunters and have completed a yearly proficiency test administered by Longwood Gardens in addition to the normal hunter safety courses required by the state. Longwood is part of the Deer Management Assistance Program (DMAP) program under an annual PA Game Commission permit. This program provides for additional antlerless deer permits to be used on Longwood property.

### Critter Management

Longwood has a team of cats that help control rodent problems in the gardens.

## **Research**

The Research Division at Longwood Gardens focuses on finding and evaluating new plants, studying and improving growing methods, improving plant characteristics through breeding efforts and cultural techniques, and correctly identifying, recording, and mapping all plant accessions. A staff of five maintains this rigorous program. Plants are obtained from expeditions (program started in 1958 and has traveled to 50 countries and all continents except Antarctica). Plants are obtained from breeding projects, plant donations, seed exchanges, and commercial sources. Approximately 200-250 new plants are evaluated each year

# Plant Production, Research, and Sustainability

Current Longwood breeding projects include projects working with *Camellia*, *Canna*, *Sarracenia*, and *Cestrum*. These breeding projects include: developing an ever-blooming, cold hardy, and fragrant *Camellia* plant, and producing a compact, self-cleaning *Canna* plant in a wide range of colors. Currently the *canna* project is focused on eliminating viruses from Longwood cultivars and selecting new cultivars from a breeding program.

Longwood has introduced more than 130 new cultivars including

- Impatiens
- Cannas
- Camellias
- Ivies
- Hollies
- Rhododendrons
- Water platters

A plant evaluation committee decides if the new plant is worthy of display or further work. Many of these unusual plants are then grown into a crop which will appear in our displays.

## Research Facilities

Non-hardy plant trials and greenhouse experiments are conducted in our 5500 square foot research greenhouses, and hardy plant trials and field research occupy about eight acres at the Longwood nursery. Longwood facilities include a soil lab and tissue culture lab. Tissue culture, or growing plants in test tubes, is an important part of that process. Tissue culture allows us to grow plants in a sterile environment to multiply plants quickly, eliminate viruses, and/or maintain a bank of virus-free plant stock.

## **Sustainability**

Longwood Gardens recently established its Eco-footprint, which has provided a quantitative measure of Longwood's environmental and energy inputs/outputs. It will be used to develop strategies to reduce demand-side energy consumption, reduce waste and enhance water conservation.

Land stewardship management seeks to preserve and protect the four watersheds and other valuable ecosystems which are contained within the property.

Longwood strives to be a model for recycling and re-use for the community. Our environmental practices are firmly grounded in our mission as the living legacy of Pierre S. du Pont. Our composting program collects 8,000 cubic yards of discarded organic material. We recycle everything possible from batteries, paper and plastic, aluminum, and much more.

Our solar field produces about 2 million kilowatt hours per year, which is the electrical equivalent of powering 181 average homes. It is expected to offset our energy

# Plant Production, Research, and Sustainability

consumption by nearly 28% and can reduce our annual carbon dioxide emissions by 1,367 tons.

# HORTICULTURE GLOSSARY

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This is not intended to be a comprehensive glossary but defines terms within this manual.

**acid-** having a pH below 7.0.

**alkaline-** having a pH greater than 7.0.

**angiosperm-** flowering plant that produces its seeds in fruit.

**annual-** a plant that completes its life cycle within one year.

**anther-** the part of the stamen that produces pollen.

**arboretum-** a collection of specimen trees for exhibit or study.

**beneficial insect-** an insect that helps control a pathogen.

**biennial-** a plant that requires two growing seasons to complete its life cycle, usually producing leaves the first season and flowers and fruits the second season before dying.

**bonsai-** Japanese, meaning plant in a container (bone-sigh).

**bract-** a modified leaf that develops below a flower or inflorescence, sometimes highly colored like the bright bracts on a *Poinsettia*.

**bulb-** a short flattened stem bearing fleshy, food storing leaves, such as an onion.

**calyx-** the outermost part of a flower consisting of sepals, green or brightly colored.

**carnivorous plant-** a plant that traps and kills insects to obtain supplemental nutrients such as nitrogen.

**chapparral-** dense thickets of scrub vegetation under 8 feet high in western, coastal North America.

**chlorophyll-** a green pigment in plants essential for photosynthesis.

**clone-** an organism genetically identical to its parent and /or siblings. In plants, it can be grown from cuttings, division or tissue culture.

**column-** male and female parts of a flower fused together into one part.

**composite flower-** an inflorescence composed of many tightly packed small flowers, such as sunflowers.



# HORTICULTURE GLOSSARY

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**compost-** plant material that is decomposed and recycled as a soil component, and the process of decomposing and recycling such plant material.

**conifer-** a woody plant that bears cones, usually featuring needle like leaves, such as pines

**conservatory-** a greenhouse used for pleasure rather than practical purposes.

**corm-** a short underground stem in which food is stored, such as in a crocus.

**corolla-** the inner circle of flower parts comprising the petals.

**corona-** the trumpet like outgrowth from petals or sepals such as the trumpet of a daffodil flower.

**cross-** to cross pollinate or the resulting plant.

**cross-pollinate-** to transfer pollen from the anthers of one plant to the stigma of another plant.

**culm-** the stem of grasses.

**cultivar-** a cultivated variety of a plant that has been intentionally selected for specific desirable characteristics such as color or disease resistance.

**day-neutral-** a plant that blooms without regard to number of daylight hours it receives.

**deciduous-** plants that seasonally shed all their leaves.

**dioecious-** having male and female parts on separate individuals, such as hollies.

**epiphyte-** a plant that grows on a tree, but receives no nutrient from the tree.

**espalier-** any flattened tree, shrub or vine trained in any pattern (es-pal-yeah or es-pal-  
yer).

**evergreen-** a woody perennial that holds its leaves throughout the year, including conifers and some broad-leaved plants.

**family-** a category of a collection of genera, generally ending in *aceae*.

**filament-** the stalk of the stamen bearing the anther.

**floret-** the individual small flower of a cluster or inflorescence.

**flower-** the reproductive structure of an angiosperm.

# HORTICULTURE GLOSSARY

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**frond-** the term applied to large, divided leaves of ferns, palms and cycads.

**fruit-** the ripened ovary of a flower.

**fungi-** a kingdom of nonphotosynthetic organisms.

**genus-** a taxonomic category of species. May be divided into subgenera, subsections and series and subseries.

**geophyte-** a plant whose perennating buds are below ground such as bulbs, corms, tubers, or rhizomes.

**greenhouse-** a glass or plastic growing house for plants, often with benches.

**grex-** a horticultural hybrid.

**gymnosperm-** plant bearing exposed seeds, often in cones.

**humus-** the product of decomposition of plant material, used to improve the fertility and texture of soil.

**hybrid-** an organism derived from crossing genetically dissimilar plants or animals.

**inflorescence-** a collection of flowers sharing a common stalk.

**labellum-** modified petal of flowers such as orchids that serves to attract and serve as a landing platform for pollinators.

**leaflet-** a portion of the blade of a compound leaf.

**mediterranean climate-** climate with moist, cool winters and hot, dry summers.

**monoecious-** a plant bearing both male and female parts, such as melons or squash.

**monopodial-** single growing point (Single foot) growth pattern for orchids such as the Phalaenopsis.

**nectary-** the specialized cells that produce nectar to attract insects.

**node-** the point on a stem from which a leaf can grow.

**orangery-** a room or building designed for holding tender plants over the winter, originally used to grow oranges and other citrus.

**ovary-** the base of a pistil containing one or more ovules (eggs) that eventually becomes a fruit.

# HORTICULTURE GLOSSARY

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**panicle-** a highly branched inflorescence, such as a begonia.

**parasite-** a plant that grows on a tree and receives nutrients from the tree.

**perennial-** a plant that grows year after year.

**petal-** the usually brightly colored part of the flower, collectively the corolla.

**pH-** number used to express acidity and alkalinity. Soil or water with a pH of 7.0 is neutral.

**photoperiodism-** the response of a plant to changes in daylight such as Chrysanthemum which bloom with shorter daylight.

**photosynthesis-** production of oxygen and energy by plants using light energy.

**pollen-** the male reproductive structure of a plant.

**pollinarium-** the male reproductive system of an orchid.

**pollinate-** to place the pollen on the stigma of a plant, to fertilize.

**pollinator-** transmitter of pollen, can be butterflies, bees, moths or birds.

**pollinium** - a mass of pollen grains.

**pseudo bulb-** a bulb-like structure in which water or nutrients are stored.

**raceme-** a type of inflorescence with flowers attached to the main stem by short stalks.

**rhizome-** an underground stem that grows horizontally.

**root pruning-** in bonsai, shortening the roots to balance the roots and amount of foliage.

**rostellum-** part of an orchid flower separating male and female parts.

**sepal-** an outer part of a flower that encloses and protects a flower bud.

**sori-** spore filled cases.

**sorus-** a plant organ for spore production on the underside of a fern leaf.

**spadix-** a type of spike inflorescence having small flowers supported on a fleshy stem.

**spathe-** a large bract enclosing the spadix.

# HORTICULTURE GLOSSARY

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**species-** The taxonomic classification of plants or other organisms able to produce fertile offspring.

**Sphagnum moss-** a bog-growing moss, also known as peat moss, often used to line hanging baskets or as a growth medium.

**spore-** a reproductive body of ferns.

**spur-** a spike, usually part of a flower, and often contains nectar.

**stamen-**the male reproductive organ in plants.

**standard-** a plant trained with a single stem and a ball-like top.

**stigma-** the female reproductive organ in plants that receives pollen.

**stolon-** an erect branch that bends to the ground, rooting where it touches and forming a new plant.

**style-** the stalk connecting the ovary and the stigma.

**succulent-** a fleshy plant with swollen leaves and stems that retain water.

**sucker-** A strong new stem arising from a horizontal root or a branch of a plant.

**sympodial-** having a horizontal flat growth stem (many footed) with several growing points such as Cattleya orchids.

**taxa-** scientific classification system of taxon.

**taxon-** a group of any rank in taxonomy such as family or species.

**tender-** referring to plants, a plant that cannot survive outdoors in the local environment.

**tepal-** outer part of a flower, usually including petals and sepals.

**terrestrial-** a plant that grows in soil.

**tissue culture** is a practice used to propagate plants under sterile conditions, often to produce clones of a plant.

**umbel-** flower stalks arising from one point on a stem, such as in Queen Anne's Lace.

**viscidium-** sticky pad on a plant which sticks pollen to a pollinator.

**vivipary-** germination of seeds while still on the mother plant, or the formation of a new plant from other specialized cells on the mother plant as in certain waterlilies or orchids.

# HORTICULTURE GLOSSARY

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## Plant Taxonomy

Kingdom (Plant Kingdom)

Phylum

Class (sometimes divided into subclasses)

Order

Family (sometimes divided into subfamilies, tribes and subtribes)

Genus

Species

Subspecies, hybrid, cultivar, forma.

Further reading:

*Botany for Gardeners, an Introduction and Guide*, by Brian Capon

*Facts on File, Dictionary of Botany*, edited by Jill Bailey available in the Longwood Library