

*American Fruit Explorers:***John Bartram: America's First Botanist**RICHARD P. MARINI<sup>1</sup>**Additional index words:** plant collector, Bartram's Garden**Abstract**

John Bartram (1699 – 1777) was born in Darby, PA. He was a Quaker farmer turned botanist. He journeyed throughout eastern North America, from Canada to Florida, and described the plant and animal life he encountered. Bartram corresponded with and sent seeds of native plants to European scientists and gardeners. He was appointed the “Royal Botanist” by King George III, and along with Benjamin Franklin he was a founding member of the American Philosophical Society. Carl Linnaeus said he was the “greatest natural botanist in the world”. Bartram purchased a farm in Philadelphia and started the first botanical garden in America, where he planted many of the specimens he collected on his trips. He collected apple cultivars and, like most farms, had a cider press. Part of the farm (Bartram’s Garden) is currently preserved by the city of Philadelphia. His son, William Bartram, continued to explore the southeastern North America and described the Native Americans and the native plants and animals he encountered.

*Early years.* John Bartram was a third generation Quaker born near Philadelphia and inherited the family farm on the west bank of the Schuylkill River. As a boy he was interested in medicine and used medicinal plants to treat symptoms of his family members and friends. While farming he observed plants, insects and animals and became interested in various aspects of biology. He travelled up the Schuylkill River and discovered plants he had never seen. He found a wild orchard of peaches and assumed that peaches were native to America. He also travelled through New York to Lake Ontario and through parts of Maryland and Virginia. On these trips he collected seeds and planted them on his farm. His son, William, was born in 1739 and as a boy he accompanied his father on some of his travels to the Catskill Mountains, the New Jersey Pine Barrens, New England and eventually to Florida. William became a naturalist and was a very good illustrator. After John’s death, William continued travelling and took detailed notes on the plants and animals that

he found and provided some of the earliest detailed descriptions of the daily activities of American Indians.

*Bartram’s travels.* From 1737 to 1765, John Bartram travelled along the Delmarva Peninsula, the Ohio River, through eastern and western North Carolina, South Carolina, and Virginia and into Georgia, Florida and what is now West Virginia. He was the first to report a number of plant species and he named some of them. In 1765 John and William discovered a tree with camellia-like, cup-shaped 5-petaled, sweetly-fragrant white flowers that were 7 cm in diameter growing along the banks of the Altamaha River in southeastern Georgia. They named it *Franklinia alatamaha*, after their friend Benjamin Franklin. He returned in 1773, at the age of 74, to collect seeds that he planted in his garden. This tree has never been observed anywhere else. The trees were last observed in the wild in 1803 and would probably have become extinct if Bartram had not propagated it, but now can be found in many botanical

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gardens. Some of the other plants described and introduced by Bartram included Venus flytrap, magnolias, mountain laurels, azaleas, rhododendrons, sugar maple, black gum, viburnum and sumac.

In 1728 Bartram established an 8-acre garden and greenhouse with over 2,300 plant species. He grew mother plants for seed production and this remains the oldest surviving American botanic garden. Next to the garden is his original house that he built and is the site of his cider press.

On each of his travels Bartram kept diaries in which he made daily notes. Some notes were extensive, but others are very brief and simply described the weather. Below are two entries from his diary in 1765, when he was in South Carolina. Most of his entries began with a description of the weather and he often described the landscape and plant material. On Sept. 3 he travelled to Purrysburg in the southwest corner of South Carolina. In this fairly long entry he described the damage from a storm and then the fruit trees that he saw. "[September] 3d[.] set out & travailed to puris- burgh[.] therm[.] 85[.] travailed through exceding wet branches & savanas flowed with water by reason of ye prodigious late rains after as dry A season[.] many trees split to pieces with lightning & cast into ye road: . . . when we came to Purisburgh we observed thair orchards consisted of mulberry trees of ye white english sort: pretty many quinces grows & bears good fruite & some peaches[.] but what surprised us most was that thay plant very few figs & pomegranates[.] as for oranges ye winter kills them while young unless protected from ye frost:" On September 16 he was in Charlestown and described how an early cold snap damaged some fruit trees. "[September] 16[.] very clear cool morning[.] wincl No. thermo[.] 63[;] PM 73[.] it is very strange that thay have A white frost in september[.] & in April thair mulberry[.] hictory[.] & peach trees young shoots has been killed with frost[.] even near ve Savanah town[;] & at Charlstown ice is frose thick enough to bear A man on thair ponds.

& snow lies otl ye ground sometimes 2 or 3 days[.] but these cases is not commiion: bit certainly thay have more colder spels then I could have expected: for these thre days I have wore A Jacket Coat & great coat & yet sometiines hardly warmn enough in A clhamber. uhere I believe I got some cold before I put my great coat on[.] I caint but admire ye indolence of these people in not planting fig & pomegranates. I have not seen one pomegranate since I left Savanah & but one or two fig trees. & indeed thay have very few in Savanah[.] neither have I seen one orange tree big enough to bear[.] indeed most have A few peach trees & chिकासaw plumbs but ye peaches[.] thay say[.] is killed often with ye spring frost[.] & both these when thay do bear is soon rotten[.] but figs would yeald 2 crops A year & pomegranates last long in ye fall[.] for about 20 or 30 mile up ye river thay have A pretty many mulberry trees planted[.] which grows well[.] & thay raise very good silk[.] which answers pretty well at present while ye bounty lasts[.] bLit if that be taken off it wont answer so well as rice & indigo[.] thay complain that silk worms takes more labour to feed then thay can spare hands to look after them[;] & sometimes frosts destroys ye mulberry leave[s] after ye worms is hatched[.]"

In addition to exploring and collecting plants, Bartram also spent time with Indians and recorded various aspects of their daily life. In 1765, John and his son William attended the congress of Picolata, where meetings between the Creek Indians and the British representatives negotiated the use of lands and the trading goods.

*Interactions with European Scientists.* Peter Collinson was a cloth merchant in England, but he developed an interest in botany and loved gardening, and collected plants. Through some business contacts, he obtained samples of seeds and plants from around the world and he realized that there was a market for novel plants in Europe. He sold seeds collected from his plants and seeds that he obtained from contacts in other countries.

In the 1730's he started corresponding with John Bartram and helped finance some of Bartram's travels. Bartram sent the first specimens to Collinson in 1735. Bartram also made detailed observations of wildlife, insects and plants and conducted experiments. At the request of some European naturalists he repeated James Logan's experiments on sex phenomena and pollination in Indian corn with the red campion, *Lychnis dioica* and he discussed plant hybridization with European scientists. He was the first to record observations discerning the difference between the long-cycle 17-year cicadas from the annual type in Pennsylvania.

Collinson was a member of the Royal Society and shared some of Bartram's letters with the membership and seven of Bartram's letters on shellfish and insects were published in *The Philosophical Transactions of the Royal Society*. With Collinson's encouragement, King George III awarded Bartram with a pension of £50/year (about \$13,870 in 2018) as "King's Botanist for North America". Bartram complained to Collinson that the stipend should be increased, but Collinson encouraged him to accept it and be thankful. In his new position, Bartram continued to travel and sent seeds to the Royal Botanic Gardens at Kew, and the Oxford and Edinburgh Botanic Gardens. Some of the seeds that Bartram sent to Collinson were sold to other members of the European aristocracy. In recognition of his services, Bartram was elected "Foreign Member of the Royal Swedish Academy of Sciences" and received a gold medal from a society in Edinburgh for obtaining useful trees and shrubs for other countries.

Bartram was the first practicing Linnaean botanist in North America and he corresponded with and sent specimens to Linnaeus and other European scientists. In addition to seeds, cuttings, scions, dried plant specimens, and plants growing in pots, Bartram also sent turtles, lizards, snakes, other small animals and insects, as well as taxidermies of birds and other animals. As a result of his in-

teractions with Linnaeus, Linnaeus said that Bartram was "the greatest natural botanist in the world." In his journals Bartram described many fruit and nut species, including pawpaw, plum, apple, peach, sour orange, almonds, persimmon, grapes, figs, citron, sweet lemon, bitter-sweet lemon, limes, guavas, banana, pomegranate, melons, strawberry, mulberry, walnut, and chestnut.

Mr. Joel Fry, curator of the John Bartram Association, provided the following information about Bartram's favorite pear (Fig. 1). "The Bartrams and the general surrounding neighborhood of Kingsessing on the west bank of the Schuylkill was a famous region for pear cultivation, and there were a large number of seedling pears named from the area -- Seckel pear, Kingsessing pear, Bartram pear (and there was a Bartram apple), and most famously the 'Lady Petre Pear'. This was a pear seedling that John Bartram raised from seeds sent in the 1730s by the wife of his first English patron, Lord Peter of Thorndon Park, Essex. The seed probably came from a French butter pear that was first sown around spring 1739. The pear finally bore fruit in the 1760s and was considered a fine pear, so the variety was preserved, and grafted to a small extent around Philadelphia. The Lady Petre pear gets mentioned in early US pomological books in the 1830s-1860s. The original tree at Bartram's Garden lived



**Fig. 1.** 'Lady Petre' pear was one of John Bartram's favorite pears. This seedling was selected from seeds sent in the 1730s by the wife of his first English patron, Lord Peter of Thorndon Park, Essex. The seed probably came from a French butter pear.

and bore fruit until around 1930. About 15 years ago we acquired a few grafted versions of the pear, taken from an example that still grows in Germantown near Vernon Park. It's now a small tree here, replanted at the original location at the southeast corner of the Bartram House. It's born fruit a few times in recent years, but generally the squirrels take all the pears before they are ripe."

*Bartram's seed boxes.* Each fall Bartram collected seeds from the wild and from plants in his garden and these seeds were shipped to customers in Europe. By the 1740's the seed exchange had become a thriving business and large boxes were standardized with about 100 assorted species for 5 guineas (about \$34.00 in 2018). The wooden boxes, with rope handles, had nine sections into which seeds and cuttings were placed (Fig. 2). Most boxes contained seeds of about 100 species. Customers often requested specific plants which they could order from a catalogue describing 168 species. Most specimens were woody plants, but he also offered some herbaceous plants. Some of the plants he commonly offered were hickory, white (probably butternut) and black walnuts, sassafras, dogwood, red cedar, sweet gum, swamp laurel (magnolia), spruce (hemlock), chestnut oak, white oak, swamp Spanish oak

(probably pin oak), and tulip tree.

*Interactions with American leaders.* In 1738 Bartram wrote to Collinson suggesting the formation of an American scientific academy similar to the Royal Society in England. Collinson's response was not very supportive because he felt that America did not have enough wealth to support such an endeavor and there were not enough "qualified members" in America. Since they lived in the same city, Bartram was friends with Benjamin Franklin. Bartram did not give up on the idea and recruited Franklin's help. Franklin, a printer by trade, printed a brochure for the new organization and they recruited a group of worthy Americans. The American Philosophical Society first met in Philadelphia in 1743 to promote useful knowledge in the sciences and humanities through excellence in scholarly research, professional meetings, publications, library resources, and community outreach. Some of the subjects of study suggested by Bartram included botanical discoveries, their propagation and possible uses, and improvements in the manufacture of cider, wines and other fruit juices. Collinson later became a patron of the Society and was a purchasing agent for the Library Company of Philadelphia, the first public library in America founded by Benjamin Franklin

in 1731. During the 1760's Franklin spent quite a bit of time in England trying to convince the British government to recognize Americans as British citizens with representation in the government. Franklin had an international reputation as a scientist and while in England he had many conversations with some of the same scientists who were corresponding with Bartram. Franklin failed in this political mission and returned to America to advocate for independence. Franklin and



**Fig. 2.** A surviving specimen of Bartram's seedbox used for international shipping of seeds and scions.

Thomas Jefferson served as ambassadors to France during the American revolutionary war and sent seeds and plant material from England, France and Italy to Bartram. On a number of occasions, Jefferson requested plants and seeds for his friends in France. Later, Jefferson often requested seeds that he planted at Monticello.

*Scientific interests.* Bartram was more than a plant collector. He was interested in many aspects of nature. He was interested in plant ecology and recognized that certain species thrived in certain microclimates. He observed succession in fields that had been cleared and abandoned by Indians. One species that he observed in these fields was the peach. Peach adapted so well to the climate and soil conditions that it became naturalized throughout the southeast and mid-Atlantic colonies as far north as Philadelphia. Bartram and other colonists believed that peach was native to America. The peach was actually introduced by the Spanish in 1562 in St. Augustine, Florida. In 1629, John Smith in Jamestown, said "Here [Virginia] are likewise great Peach-Orchards, which bear such an infinite quantity of Peaches, that at some Plantations they beat down to the Hoggs fourty bushels in a year." In the early 1700s, the English Surveyor-General of North Carolina, John Lawson, said peaches grew so luxuriantly as weeds: "we are forced to take a great deal of care to weed them out, otherwise they make our Land a Wilderness of Peach trees." It is interesting that peach was considered invasive during the early colonial period, but today wild stands of peaches don't exist.

Bartram was interested in plant physiology. He wanted to know why environmental factors influenced how plants grew. In correspondence with Collinson, the two men were perplexed by the fact that some species became invasive when introduced into new environments. One example was yellow toadflax (*Linaria vulgaris*) that had been introduced as a garden ornamental but had escaped and become a pest. Collinson also recommended some experiments, but Bartram

never undertook most of them. Below is an example of an experiment suggested by Collinson designed to determine if two apparent species growing in different regions were actually the same species, but the growth characteristics were modified by their environment. "The Descriptions are so exact and Natural that I am always delighted with reading them but my Good Friend I must Impart to thee my doubts—I am afraid the Species are so multiplied that it will be a difficult task to distinguish them Here. The Difference between the Low Land White Oke & the Mountain White Oke is purely owing to their Situation & that cannot be determined but by Experiments; take the acorns of Each & plant in thy Garden. A few years observation will putt the Matter out of Doubt, & the Like may be in the Swamp & Mountain Chesnutt a Difference owing to Soil & situation not Sufficient to constitute Two distinct Species & so of the Spanish & Swamp Spanish Oke. I know this Tribe of Trees Sport so in their Leaves that it is easy for thee to collect Specimens that shall have a great appearance of a distinct Species but the question is will this hold through the Forest."

In the 1700's botanists were arguing about sexual reproduction in plants. Bartram studied floral anatomy, plant morphology and pollination and he was interested in hybridization. He observed that some species had male and female flowers on the same plant and some species had male and female flowers on different plants. In a letter to Colonel William Byrd of Virginia, Bartram described making microscopic observations upon the male and female parts in vegetables. He also performed experiments where he prevented cross pollination and controlled pollination, and he stated by "joining [cross-pollinating] species of the same genus and obtained curious mixed colors in flowers, never known before." He also stated, "I hope by these practical observations to open a gate into a very large field of experimental knowledge, which, if judiciously improved, may be a considerable addition to the beauty of the



florist's garden." In a letter to Collinson in 1742 he explained the role of insects in pollination: "That some variegations may be occasioned by insects is certain; but then these are only annual, and cease with the year," and later he said, "permanent variegations are produced by budding—a sort of inoculation."

Bartram was also interested in geology and soil. He understood the importance of organic matter in the soil and that frequent plowing can deplete soil. He advocated applying compost and using green manure, crop rotation, especially with legumes.

*Correspondence with Peter Collinson.* Bartram corresponded with many European scientists and gardeners as well as Americans who were interested in plants, such as Benjamin Franklin and Thomas Jefferson. However he probably corresponded most frequently with Peter Collinson and they typically wrote to each other three or four times a year for several decades. Below are some examples of their correspondence related to fruits and nuts.

- Some of the seeds that Bartram sent to Collinson were redistributed to British gentry, nurserymen and natural scientists. Collinson also sent seeds to Bartram and in 1738 he sent some hard-shelled and soft-shelled almonds from Portugal. Collinson said that when the nuts were harvested early "whilst a pin can be run through them, you eat husk, shell, and kernel altogether, before the shell is hard." He used these to make pies.
- In November 1731, Bartram summarized his observations of fruit production in eastern Pennsylvania. "Peaches, pears, and apples, are the fruits most grown in this and the neighbouring states. Apricots and nectarines do not succeed, except in very fine seasons; the fruit being punctured by a species of *Curculio*, and dropping off about the time of stoning. Gooseberries do not succeed except in a few shady places; currants do very well. What surprised me most was the short duration of the peach

trees, which seldom bear longer than from three to five years: they are attacked by worms at the root, and die soon after. The best remedy found out yet, is to keep a large stock of young trees always ready to plant in the orchards, when the others die. The inconvenience resulting from the short life of these trees is in great measure obviated by the facility with which a nurseryman can procure a young stock. There is now in this nursery above 2000 young and healthy peach trees, which will bear fruit next year; the stones were sown eighteen months ago; they were budded the following August, and are now from 6 to 10 ft. high, and are well branched and formed for standards."

- "I have often seen peach, aple, cherry & mulberry trees planted with out any branches & but 2 or 3 buds which have in A few years made fine flourishing trees ..."
- Collinson ordered some trees of 'Newtown Pippin' apples. Both Bartram and Franklin had sent some Pippins to him and he liked them very much. He was also aware that 'Albemarle Pippin' (another name for 'Newtown Pippin') was Thomas Jefferson's favorite apple. This cultivar originated around 1700 near the village of Newtown on Long Island, New York. Colonel Thomas Walker grew it on his Castle Hill estate in Virginia, and brought scions to Albemarle County (home of Jefferson's Monticello) as he returned from the battle of Brandywine, near Philadelphia, in 1777. George Washington also liked this cultivar. Below is their correspondence involving Collinson's request for 'Newtown Pippin'.

*June 1758 - Bartram to Collinson* describing the apple and explaining he will send scions: "the newtown Pipin is realy a fine apple & yet our pensilvanians hath not propagated them so generally as thay might have done we have such a great variety of good aples which we like nearly as well. If I had received thy letter before grafting season was over I would have grafted some in the small

roots & transplanted them in order to be seen [sent?] next fall but the best way now will be to stick some grafts in A box of earth with the plants & you may have them as fresh as if thay was new cut & if you graft them in the spring in A young bearing tree thay may bear in two years I frequently cut grafts in september carrieth them several hundred miles & graft them next spring & thay grow finely”

*March 1759 – Collinson to Bartram* expressing disappointment in receiving no scions. “Wee was Sadly Disappointed being in hopes of Seeing Some Grafts of the True New Town pippin but there was none pray remember another year—for what comes from you are Delicious Fruit if our Sun will ripen them to such perfection—out Frd Benjamin had a fine pcell of the apples came over this year in wch I shared—”

*April 1759 – Collinson was disappointed in the quality of the scions* he received. “Thee Disappointed sending only 3 or 4 grafts of Newtown pippins Be Sure send Trees of Each Sort & more grafts for they Look Fresh & Well, would have been better Tied up in Moss—these Sent was loose—”

*October 1759 – Collinson thanked Bartram for sending scions.* “I am much obliged to thee for Grafting the Newtown Pippins, what fruit comes from you is Excellent—I wish our sun may bring it to the Like perfection Wee will give them a fair Tryal—in different situations—”

*February 1760 – Collinson indicated that the grafts were successful.* “& the Newton Pipins are all alive and promise well, time must Discover wether their Excellency is derived from your fine Climate—”

*Bartram’s Garden.* In the 1630’s the land along the Schuylkill River was originally settled as a New Sweden colony. Bartram bought 102 acres from the descendants of these Swedish settlers in 1728 where he grew plants for seed distribution and sale. In a 1761 letter to Peter Collinson, Bartram wrote “I can challenge any garden in America for variety.” After his death his granddaughter Ann Bartram Carr and her husband, Colo-

nel Robert Carr continued the international seed and plant business and they expanded the garden to include 10 greenhouses and a collection of over 1,400 native plant species, plus about 1,000 exotics. They had financial problems and sold the garden in 1850. Andrew Eastwick, a wealthy railroad businessman, bought the garden in 1850 and temporarily lived in the Bartram house and preserved the grounds as a private park for his estate. Upon Eastwick’s death, a national campaign for funds was aided by Charles Sargent of the Arnold Arboretum. In 1891 the City of Philadelphia took control of the site and it remains a protected site. Descendants of Bartram created the John Bartram Association in 1893 and today the site is managed by the Association in cooperation with Philadelphia Parks and Recreation. The Association’s mission is “to protect and enhance the landmark Bartram’s Garden and house, and advance the Bartram legacy of discovery and art, and inspire audiences of all ages to care for the natural world.” Today the Garden has 45 acres of parkland, wildlife habitats, tidal wetlands, and a reclaimed meadow (Fig. 3) The nursery focuses on native plants which are available for purchase year-round in the Welcome Center. The grounds are open to the public year-round free of charge and tickets can be purchased for guided tours. The Garden is also the site of the four-acre Sankofa Community Farm with about 20 paid local high school interns and hosts more than



Fig. 3. The restored Bartram house.

1,500 volunteers annually. The program is funded by grants and donations. The garden hosts many educational events and programs during the year. More information can be found at <https://bartramsgarden.org/about/mission-vision/>.

The Diary of a Journey through The Carolinas, Georgia, and Florida From July 1, 1763 to April 10, 1766 was annotated by Francis Harper, research associate of the John Bartram Association in Philadelphia. Harper introduced the volume with the following statements which summarize John Bartram's contribution to American science. "John Bartram was one of the nine original members of the American Philosophical Society, formed in 1743. As the earliest notable figure in a long succession of distinguished Philadelphia naturalists, as the founder of the first real botanical garden in America, as a correspondent of Linnaeus, Gronovius, Dillenius, Catesby, Collinson, Fothergill and other savants abroad, and as botanist to the King of England, he is assured of an enduring place in the annals of American science."

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