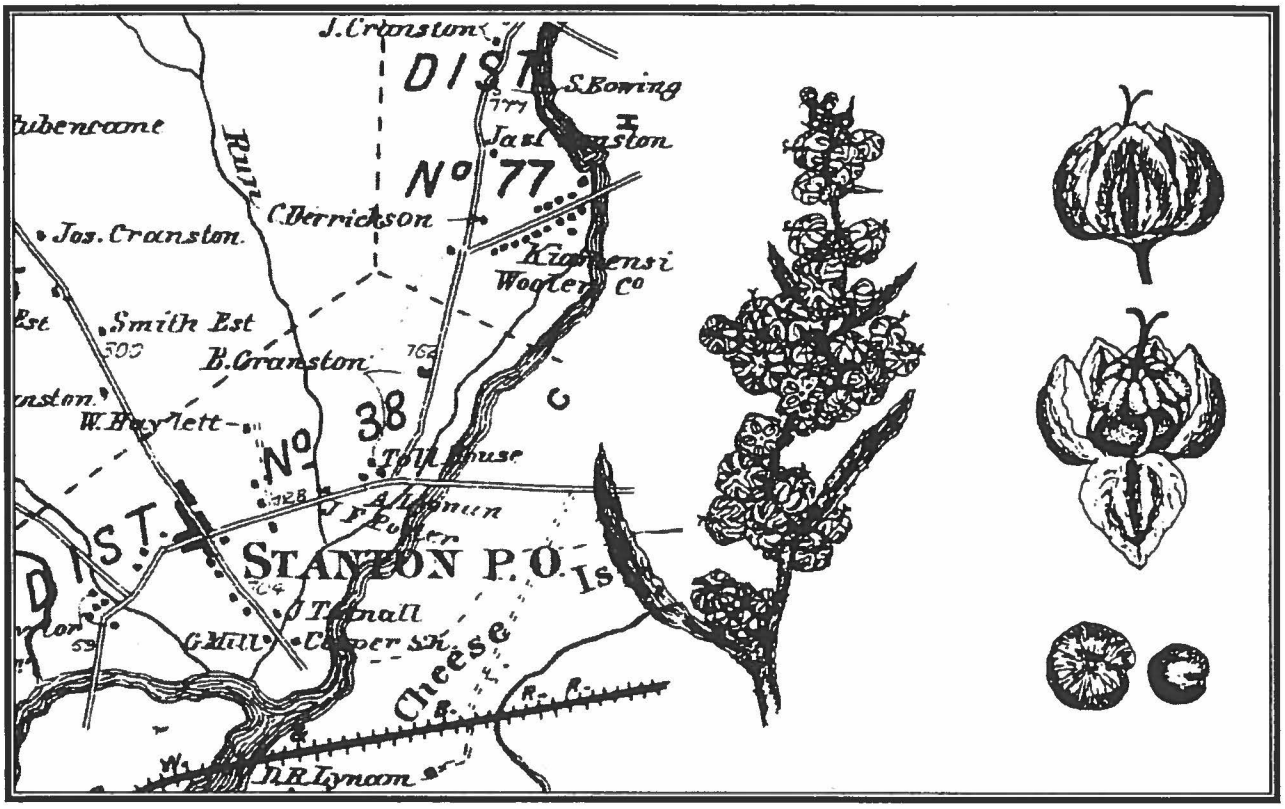
The Bulletin of the Archaeological Society of Delaware



ISSN 0003-8067
Number forty-two, new series

Fall 2005

On the Cover: Detail of the 1868 Beers Atlas; Detail of Lambsquarter from Common Weeds of the United States, USDA.

Archaeological Society of Delaware
P.O. Box 12483
Wilmington, Delaware
19850-12483

President – Tim Mancl

Treasurer – Jessica Billy

Secretary – Alice Guerrant

Membership Secretary – Joan Parsons

Board Member-at-large – Peter Bon

Newsletter Editor – Jessica Billy

Bulletin Editor – Keith Doms

Affiliates:

Delaware Archaeological Forum

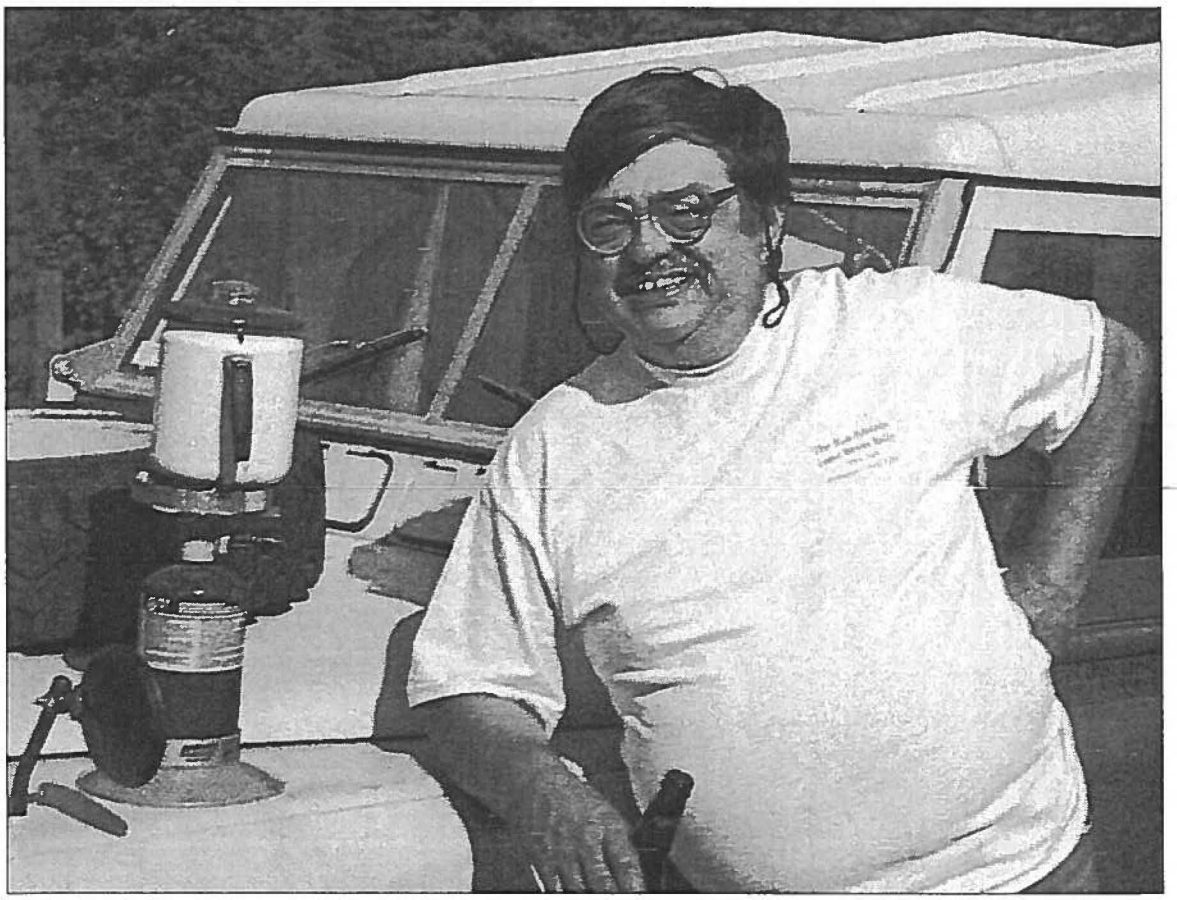
Delaware Archeology Awareness Committee

Member, Eastern States Archaeological Federation

Edward F. "Ned" Heite

Ned Heite passed away in his beloved home, "Lackluster Lodge", in Camden, Delaware on April 17, 2005. A Dover native with an insatiable appetite for Delaware history, Ned earned a BA and an MA from the University of Richmond, and was Hagley Fellow at the University of Delaware. During the 1960s Ned served as Managing Editor for the *Virginia Cavalcade*, and as Archaeological Historian for the Virginia Historic Landmarks Commission. Moving back to Delaware in the 1970s, he served as the first Historic Registrar for the Delaware Division of Historical and Cultural Affairs during which time he oversaw the restoration of the Old State House in Dover, and the development of the first state plan for historic preservation. Ned later served as Chief of the Delaware Bureau of Archives and Records. In 1980 he formed Heite Consulting, Inc., a contract archaeology and historic preservation firm, which he ran unitl his death. Through Heite Consulting he left a legacy of notable scholarship on Delaware's past that consists of hundreds of authored and co-authored reports and articles on regional archaeology and history. A long-time member of the Archaeological Society of Delaware, Ned served as editor of the ASD Bulletin from 2001 to 2004, and received the Archibald Crozier Award in 1999.

The articles in this edition of the Bulletin represent a small sample of the work conducted by Heite Consulting. The first is an overview of milling along the Red Clay Creek written by Ned. He unfortunately passed before he could finish preparing the article for the Bulletin. We hope he would have approved of the manner in which we edited the article. The second article on the archaeobotany of Delaware owes a large debt to work conducted by William Sandy for Heite Consulting at the Bloomsbury Site, and the Laban Rogers House Site.



Edward F. "Ned" Heite and his beloved 1969 SWB Series IIA Land Rover, "Baby."

Selected Publications:

The development of steamship fire safety regulations for American vessels, 1905-1925. MA Thesis, University of Richmond, 1963.

"Pipe industry reflected in tools," *Quarterly Bulletin Archeological Society of Virginia*, December 1969, 118-119.

"Excavation of the Fredericksville Furnace site," *Quarterly Bulletin Archeological Society of Virginia*, December 1970, 61-96.

(with William T. Buchanan, Jr.) "The Hallowes site: a seventeenth-century yeoman's cottage in Virginia," *Historical Archaeology* 1971, 38-48.

(with Louise B. Heite) "Excavations at the Ware Bottom Church site, Chesterfield County, Virginia," *The Chesopiean*, April 1972, 37-41.

"American made pipes from the Camden site," *Quarterly Bulletin Archeological Society of Virginia*, December 1972, 94-99.

"Several Virginia brick clamps: a summary of brickmaking," *Quarterly Bulletin Archeological Society of Virginia*, September 1973, 48-45.

"The Delmarva bog iron industry," *Northeast Historical Archaeology*, Autumn 1974, 18-34.

Historic site report Accokeek Furnace property Stafford County, Virginia, Submitted to Smithsonian Institution, National Museum of American History, Division of Civil and Mechanical Engineering, April 1981.

"The pioneer phase of the Chesapeake iron industry: naturalization of a technology," *Quarterly Bulletin Archeological Society of Virginia*, September 1983, 133-181.

"The archives survival guide ... a vade mecum for intrepid researchers," *Quarterly Bulletin Archeological Society of Virginia*, September 1984, 113-144.

(with Louise B. Heite) "Town plans as artifacts: the Mid-Atlantic Experience," *Quarterly Bulletin Archeological Society of Virginia*, volume 41, number 3, September 1986, 142-159.

(with Louise B. Heite) *Fort Elfsborg 1643: A background study of the history of Elsinboro Point or Fort Elfsborg, Elsinboro Township, Salem County, New Jersey and New Castle County, Delaware*. Submitted to Philadelphia District, Corps of Engineers, January 1986.

(With Louise B. Heite) *Saving New Amstel: A proposed City of New Castle archaeological preservation plan*. Prepared for the Trustees of the New Castle Common, March 1989.

Archaeological data recovery on the Collins, Geddes Cannery Site, Road 356a, Lebanon, North Murderkill Hundred, Kent County, Delaware. Delaware Department of Transportation *Archaeology Series* 83, 1990.

Mills on Wilson's Run: Archaeological and Historical Phase I and Phase II surveys in connection with intersection improvements to roads 92 and 100, Christiana Hundred, New Castle County, Delaware. Delaware Department of Transportation *Archaeology Series* 95, 1992.

"Unearthing Business History: Can archaeology provide evidence for interpreting management styles?" *IA: The Journal of the Society for Industrial Archeology*, volume 18, numbers 1 and 2, 1992, 123-128.

"Can sizes and waste at the Lebanon cannery site: Unscrewing the inscrutible," *Bulletin of the Archeological Society of Delaware*, number 30, new series, Fall 1993, 43-48.

"Folk technology and creolization reconsidered," *Quarterly Bulletin Archeological Society of Virginia*, March 1993, 1-13.

(With Cara L. Blume) *A community on McKee Road*. Delaware Department of Transportation *Archaeology Series* 109, 1995.

(With Cara L. Blume) *Data recovery excavations at the Blueberry Hill Prehistoric Site (7K-C-107.)* Delaware Department of Transportation *Archaeology Series* 130, 1995.

"The archaeology of tinplate," *Tin International*, vol. 71, no. 8, August 1998, 14-15.

The "Invisible" Indians of Southern Delaware. *Journal of Middle Atlantic Archaeology*, volume 15, 1999, 157-176.

(With Cara L. Blume) *Mitsawokett to Bloomsbury: Archaeology and history of an unrecognized indigenous community in central Delaware*. Delaware Department of Transportation *Archaeological Series* 154, in press.

"Flea market archaeology: A new look at artifact dating, consumer behavior, and flea markets, with reminiscences of Delaware traditional recycling practices. *Bulletin of the Archeological Society of Delaware*, Fall 2001, number thirty-eight, new series, 23-27.

"More than just bricks," *Bulletin of the Archeological Society of Delaware*, Fall 2001, number thirty-eight, new series, 28-32.

"Genealogy as an auxiliary science of archaeology," *Journal of Middle Atlantic Archaeology*, volume 17, 2001, 133-135.

"Colono: Also a European Pottery Tradition?" *Quarterly Bulletin Archeological Society of Virginia*, March 2003, 23-34.

A pictorial survey of the Harlan and Hollingsworth Machine Shop, West Street, Wilmington, Delaware. Prepared for the Commonwealth Group, 2004.

AN OVERVIEW OF MILLING ALONG THE LOWER RED CLAY CREEK VALLEY

By

Edward F. Heite

This is a report of cultural resource investigations along the floodplain of Red Clay Creek in New Castle County, from Kiamensi mills downstream to the Stanton mills.

New Castle County proposes to build a new interceptor sewer along Red Clay Creek, in Mill Creek Hundred, passing along the floodplain parallel to the existing sewer. A branch will be built up Calf Run. Because Red Clay Creek and its tributaries are "waters of the United States," the project is subject to Corps of Engineers permitting, and therefore Section 106 of the National Historic Preservation Act.

A Phase I and Phase II survey of the Red Clay valley, including the project area, was completed by the author in March 1996 (Heite 1997a). That survey identified the Kiamensi and Stanton mills as potentially eligible for listing in the National Register of Historic Places.

Red Clay Valley economic and industrial history can be divided into three distinct periods: the Local Service Period, the Major Industrial Period, and the Urbanization period.

1. Local Service Period (1680-1780)

During the earliest historic period, the valley's water resources were exploited by millers who served the needs of local farmers. Sawmills and gristmills along the creek and its tributaries operated seasonally and required relatively little waterpower. Most were small and required little capital.

2. Major Industrial Period (1780-1880)

Oliver Evans, whose family's mill stood near Greenbank, revolutionized the flour milling industry when he applied waterpower to most of the functions of a mill. Once the grain was loaded into an Evans mill, waterpower lifted, ground, sifted, and cooled the product untouched by human hands until it came down the chute into a bag or barrel.

Mills employing this revolutionary system required more power, which encouraged millwrights to raise dams and introduce more efficient water wheels. Mills became bigger and more expensive.

Other water-powered industries, including textile, spice, and iron manufacture, exploited the valley's waterpower during the period.

3. Urbanization Period (1880-1980)

Dependence on waterpower dictated that industrial sites be dispersed along flowing streams. When railroads were introduced, they provided a conduit from the mills to the market and seaport towns.

For a while, railroads appeared to benefit the millers along the remote valleys where America's industries were located. The iron horse provided a conduit for goods from the water-

powered industries into the railroad-related urban trading centers. But the same steam technology would eventually make water-powered mills obsolete. During the middle years of the nineteenth century, stationary steam engines became more practical for driving factories, and industrial operations began to cluster in cities. One by one, mills closed and cities grew. Rail transportation and electric-powered light rail networks encouraged suburbs to develop in the old mill valleys.

Milling in the Lower Red Clay Creek Valley

Saw mills were among the first water-powered industries in America, and they continued along Red Clay Creek through the nineteenth century. Oliver Evans, a millwright on the stream, published a plan for a reciprocating sawmill that probably was the common type in his locality (Hindle 1974:120-141). The 1804 assessment, transcribed in Table 1, indicates that saw mills continued to be a major factor in the local economy.

Flour milling, done in custom mills, in New Castle County was originally a local service activity, but by the end of the eighteenth century, merchant mills dominated the region. A

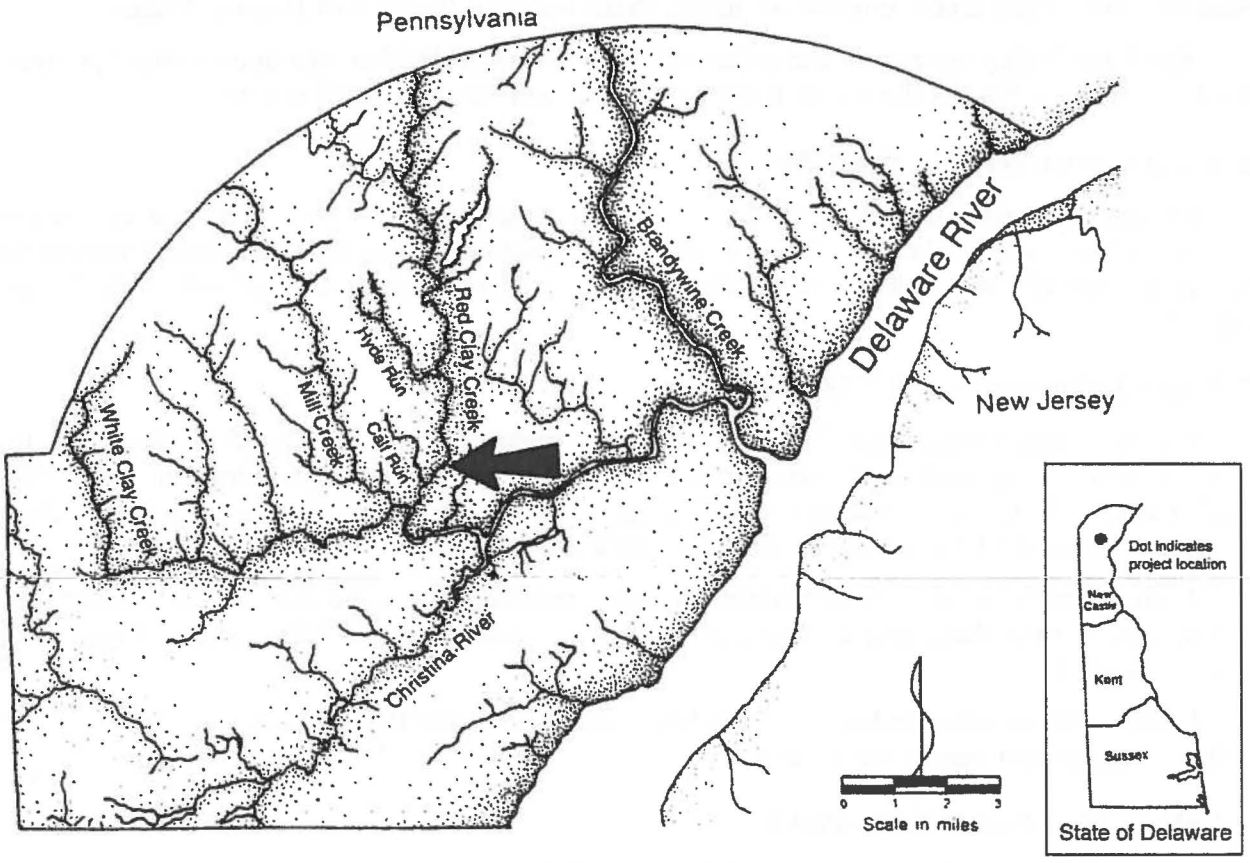


Figure 1

Project Location (arrow) in the context of local waterways.

Drawing by Aaron Jones

merchant miller bought grain and sold flour, whereas the traditional gristmill or custom mill took a share of each grain consignment as payment.

Merchant mills shipped flour in barrels, which required the services of many coopers. Cooperage may help to account for some of the large number of sawmills, which were frequently located on the same seats with grist or merchant mills.

By the end of the eighteenth century merchant mills dominated milling activity Mill Creek Hundred. Some mills were owned by absentee merchants, but a small group of interrelated families controlled most of the mill seats. The same surnames recur in the ownership history of mill properties along the creek (**Table 1**) Oliver Evans, who revolutionized milling worldwide, belonged to one of these mill families, and tried out his concepts on the Red Clay Creek.

Only one mill on the 1804 list was devoted to textiles: a fulling mill. Fulling is a traditional process that cleans and thickens finished wool cloth. That could be made at other mills or home weavers. Within a decade, the Red Clay Valley would fill with industrial textile mills, including those for spinning and weaving. This movement began in 1809 with Mordecai McKinney. McKinney's mill site later housed the Kiamensi Woolen Company.

Embargo, and the subsequent wartime interruption of trade with Britain, gave American textile makers a significant but artificial advantage. The price of cloth soared, only to crash when British goods flooded the market after the war. During the war, American broadcloth brought $10 to $12 a yard, dropping to $7 after the war and down to $3 in 1820 (Gibson 1966:106).

John Armstrong and Samuel Meteer and Co.	1 paper mill 1 saw mill
James Black's estate	1 merchant mill
Henry Brackin	1 merchant mill 1 saw mill
William and Abraham Barker	1 saw mill
Joseph England	1 merchant mill 1 saw mill
William Foulk	1 merchant mill 1 saw mill
Caleb Harlin, Sr.	1 merchant mill 1 saw mill
Isaac and Benjamin Hersey	1 merchant mill 1 saw mill
Robert Johnston	1 grist mill 1 saw mill
Joshua Johnston	1 fulling mill
Ephraim Jackson	1 saw mill
William Little	1 saw mill
Thomas McDaniel	1 saw mill
David Morrison's estate	1 saw mill
Joseph Marshall	merchant mills
James Mendinhall	1 grist mill 1 saw mill
John Phillips	1 merchant mill
Robert Phillips Est.	1 merchant mill 1 saw mill
John Reece Est.	1 merchant mill 1 saw mill
Andrew Reynolds	1 merchant mill
Thomas Stapler	one half of a merchant mill
Joshua Stroud's Est	one half of a merchant mill
Jacob Wollaston	1 grist mill 1 saw mill
Totals	
Saw mills (10 on sites with other mills)	15
Grist mills	3
Merchant mills	13
Fulling mill	1
Paper mill	1

Table 1: *List of 19th century Mill Owners on the Red Clay Creek Compiled by Scharf (1889).*

During the nineteenth century, innovators from outside the community introduced new processes and products to the valley. These innovators built new factories, such as the one at Kiamensi, using more efficient power technology.

According to the 1820 census of manufactures, wool and cotton factories represented a sizable part of the market value of New Castle County's output (**Table 2**). The values listed in the printed census abstract emphasize the importance of wool and cotton in the New Castle County economy during the period following the War of 1812.

The 1820 census returns are, unfortunately, not complete, and sometimes it is difficult to identify sites and companies responding. At the end of the chapter is a transcription of the raw data on textile-related mill sites, from the National Archives microfilm publication.

A few years later, in 1832, Louis McLane assembled a remarkable survey of American manufactures, known colloquially as the McLane Report, (22nd Congress, First Session, House Document 308, serial set volume 223). The general breakdown for New Castle County is shown in **Table 3**. Because the products were arranged according to tariff rate schedules, rather than industrial categories, this table is less useful than the raw data, which can be broken down and reassembled by individual readers into more logical groupings.

The 1832 report reflected turbulent times. Of the twenty New Castle County grist mills for which a founding date was reported, fifteen were established after 1820. The other five were generally the old established mills that occupied the best-developed seats.

Rapid turnover of ownership characterized the changes in manufacturing along the creek. Most of the operators who had responded to the 1820 census were gone a mere dozen years later, when the 1832 survey was conducted. The old milling families were still there, but they adapted to changed times or retreated to marginal status. Some of the traditional gristmills survived into the twentieth century, generations after they had been rendered technologically obsolete.

Product	*Market Value of product*
Textiles	$146,000.00
Flour and meal	$139,000.00
Barley	$5,000.00
Leather	$30,800.00
Paper	$101,000.00
Powder	(two companies, no numbers)

Total, without powder	$421,800.00

Table 2: *Data from the 1820 Census of Manufactures.*

Product	*Market Value of product*
Cotton, woollen, powder manufacturers	$347,682.00
Machinists, boots, saddles, trunks, coaches, paper	$36,250.00
Hatters, brick makers, lime burners, iron founders, etc.	$90,100.00
Tanners, curriers, quercitron bark grinders	$60,800.0
Flour, meal, oak bark and lumber	$485,692.00
Statewide tabulations emphasize the numerical dominance of New Castle County in the manufacturing sector:	
New Castle County total	$1,020,524.00
Kent County total	$165,088.00
Sussex County total	$40,000.00

Delaware total	$1,225,612.00

Table 3: *Data from the 1832 Census of Manufactures.*

The 1832 data was arranged by stream drainage, reflecting the longstanding tradition of dependence on waterpower. Some manufacturers, who evidently were liberated by steam engines from reliance on waterpower, were listed in "Wilmington" or "Stanton" rather than along a stream (**Table 4**). These factories included a gunpowder factory, two machine factories, and an iron foundry. Among these factories were nascent industries that would come to dominate the urban scene, including the shipyards and heavy machinery works along the Christina in Wilmington (**Table 5**).

By the end of the century, the Pilling family's Kiamensi Mill in Marshaltown was the only operating representative of the fourteen woollen mills established in the county after Mordecai McKinney established the industry on the same seat in 1809 (Gibson 1966:33).

The waterpower era of New Castle industry did not end at the close of the nineteenth century. Still, other power sources, primarily steam, were appearing on the mill seats to supplement the water supply. The Kiamensi Mill in Marshaltown had a steam engine that ran an electric generator, and a water pump. The generator supplied electricity for lighting, and perhaps for running machinery.

The most visible remains in the project area today belong to the major industrial period of the valley's history (1780± to 1880±). The 1772 Stanton race and the partial foundations of the 1864 Kiamensi woolen mills bracket this vibrant period and may be cited to illustrate the major trends and events in the early industrial history of the lower Red Clay Creek valley.

Mill Name	Proprietor	Hundred	Stream	Product(s)	Working?
Sharon	John Hirons Jr.	Christiana		cotton yarn	no
Simsville [Walkers]	Siddall & Co	Brandywine	Brandywine	cotton yarn & cloth	yes
Endeavor	Thomas Lea	Christiana	Red Clay	cotton yarn	yes
Madison Factory	John Brown	Christiana?	Red Clay	wool yarn & cloth	yes
[Henry Clay]	Duplanty, McCall	Christiana	Brandywine	cotton yarn	no
Rockford	J & W. Maltby	Christiana	Brandywine	wool yarn & cloth	yes
	J. W. Carter	Christiana	Brandywine	cotton yarn & cloth	yes
Rocktown	J. Bringhurst	Christiana	Brandywine	cotton yarn	yes
	Charles duPont	Brandywine	Brandywine	cotton & wool yarn, cloth, dyeing	yes
	W. Almond	Mill Creek		cotton yarn	yes
Roseville	Hart & Hamer	Mill Creek	White Clay	cotton & wool yarn, cloth, dyeing	yes
Brandywine			Brandywine	wool yarn & cloth	no
	W. Yonny & Son	Brandywine		cotton & wool yarn, cloth, dyeing	yes
[Auburn]	Jacob Pusey &Son	Christiana	Red Clay	cotton yarn	no

Table 4: *1832 New Castle County Census of Manufactures textile returns.*

Table 5: *1832 New Castle County Censuses of Manufactures*

Mill Name	Proprietor	Stream	Product(s)	Working?
	Caleb Churchman	Naamans	Merchant flour mill	
	Bayard Grubb	Naamans	Grist mill	
	George Bush	Naamans	Oil mill	no
	Abner Cloud	Naamans	Saw mill	
	Henry Webster	Shellpot	Grist mill	
	Jacob & Esau Sharpley	Shellpot	Saw mill; Wool carding	no
	George Davis	Shellpot	Grist mill	
	John Beeson	Stoney Run	Saw mill	
	Jacob Smith	Beaver Run	Grist mill; Saw mill	
	John C. Farra	Beaver Run	Grist mill	
	--- Sacriste	Beaver Run	Woollen manufactory	
	James Price & Sons	Brandywine	Five merchant flour	
	James Canby & Sons	Brandywine	Four merchant flour	
	Samuel Poole	Brandywine	Two merchant flour	
	Samuel Shipley	Brandywine	One merchant flour	
	Garrett & Pusey	Brandywine	Cotton spinning mill; city waterworks	
	Reeves & Wood	Brandywine	Machine making	
	Benjamin Webb	Brandywine	Bark mill	no
	Benjamin Ferris	Brandywine	Cotton mill	"abandoned"
	--- Jones	Brandywine	Snuff mill; Grist mill	
	J & T Gilpin, now Brandywine Manufacturing Co.	Brandywine	Paper manufactory	
Rockford	Joseph Bancroft	Brandywine	Cotton spinning	
	Breck & Swift	Brandywine	Cotton spinning	
	[Robert?] William			
	Hilton& Son	Brandywine	Cotton & wool manufactory	
	George Hodgson	Brandywine	Machine maker	
	E. J. DuPont & Kirk	Brandywine	Grist mill	
	E. J. DuPont & Kirk & Hutchinson	Brandywine	Cotton spinning	
	E. J. DuPont & Co.	Brandywine	Gunpowder manufactory	
	E. J. DuPont	Brandywine	Woollen manufactory	
	J. P. Garesche	Wilmington[?]	Gunpowder manufactory	
	Mahlon Betts	Wilmington[?]	Iron foundry	
	Jacob Alrichs	Wilmington[?]	Machine maker	
	McClary & Bush	Wilmington[?]	Machine maker	
	Samuel Richardson	Mill Creek	Grist mill	
	Samuel Bailey	Mill Creek	Merchant mill	
	George Craig & Co	Stanton [?]	Saw mill	
	Stapler & Craig	Stanton [?]	Bark mill	
	Mitchell & Guin	Stanton[?]	Cotton mill	
	---- Marshall	Stanton [?]		
	George Platt	Stanton [?]	Merchant flour; Bark	
	John Connelly	Red Clay	Cotton spinning	
	James Buckingham	Red Clay	Merchant and grist mill	
	William Atkins	Red Clay	Merchant and grist mill; Bark	
	--- Falls [Fell]	Red Clay	Chocolate, mustard, &c	
	---- Barker	Red Clay	Saw mill	
	Allen [Alan] Wood	Red Clay	Iron rolling mill	
	Joshua Lobb	Red Clay	Grist mill; Saw mill	
[Greenbank]	J. C. Phillips	Red Clay	Merchant and grist mill; Saw mill	
[Auburn]	Jacob Pusey	Red Clay	Cotton spinning	
	Andrew Reynolds	Mill Creek	Grist mill	
	John Harlan	Mill Creek	Grist mill; Oil mill	
	--- Stafford	Mill Creek	Cotton mill	
	[Jesse] Trump	Pike Creek	Cotton mill	
	--- Johnson	Pike Creek	Grist mill; Saw mill; Fulling mill	
	Samuel Stroud	White Clay	Merchant mill	
	---- England	White Clay	Grist mill	
Roseville Factory	Harry Connelly	White Clay	Cotton spinning	
	--- Chamberlain	White Clay	Merchant mill	
	--- Meteer	White Clay	Paper mill	
	--- Rankin	White Clay	Grist mill; Bark mill	
	--- Crawford	White Clay	Grist mill	

Table 5 (continued): *1832 New Castle County Census of Manufactures*

Mill Name	Proprietor	Stream	Product(s)	Working?
	--- Kelly	Christiana	Grist mill	
	---- Janviers	Christiana	Grist mill	
	[William] Cooch	Christiana	Merchant mill	
	----- Meteers	Christiana	Grist mill	
	---- Macbeth	Christiana	Saw mill	
	---- Ray	Christiana	Grist mill	
	---- Falls	Christiana	Paper mill	
	Jacob Vandegrift	St. Georges	Saw mill; [Carding mill]	
	Samuel Thomas	Drawyers	Grist mill	
	John Cannon	Drawyers	Grist mill	
	John Grimm	Appoquinimink	Grist mill	
	Samuel L. Ecles	Appoquinimink	Grist mill	
	---- Walker	Appoquinimink	Grist mill	
	Ira Lyons	Blackbird	Grist mill; Saw mill	

REFERENCES

Gibson, George H.

1966 Fullers, Carders, and Manufactures of Woolen Goods in Delaware: The Delaware Woolen Industry. *Delaware History* Vol. XII. pp. 25-53, 83-120.

Heite, Edward F.

1997 *Report of Background for Phase II Cultural Resource Survey in Connection with Proposed Improvements on the Red Clay Creek Interceptor Sewer.* Prepared for Tatman and Lee Associates.

Hindle, Brooke, editor

1974 *America's Wooden Age: Aspects of Early Technology.* Sleepy Hollow Press. Tarrytown, New York.

Scharf, J. Thomas

1888 *Delaware History, 1690-1888.* 2 Vols. L. J. Richards and Co. Philadelphia, Pennsylvania.

TOWARDS A HISTORIC ARCHAEOBOTANY OF DELAWARE: 25 YEARS OF HISTORIC SITE FLOTATION

by

William Sandy, RPA

ABSTRACT

This report documents the plants identified from soil flotation at six historic archaeological sites in the State of Delaware: Wilmington Boulevard, New Castle County; Bloomsbury, the John Darrach Store, the John Powell Plantation and the Richard Whitehart Plantation sites in Kent County; and Laban Rogers Site, Sussex County. Information on food and medicinal uses of over 100 plants from these and other historic sites are presented in order to form a preliminary historic archaeobotany of Delaware. The flotation results and floral remains are compared with discoveries from other historic archaeological sites in Delaware and the region. The implications of this work for the future of historical archaeology is clear, knowledge is accumulating about historic plant distribution and use. The seeds from flotation are the botanical history of Delaware, written in DNA.

INTRODUCTION

This paper presents a preliminary historic archaeobotany of Delaware that was developed by detailing most of the flotation studies that have been conducted at Delaware historical archaeological sites. It provides information on food and medicinal uses of over 100 plants identified from flotation soil at historic sites located in all three of the State's counties. These sites include the Laban Rogers Site (7S-K-118) in Williamsville, Sussex County; four Smyna-area Kent County sites: the Bloomsbury Site in Duck Creek Hundred, the John Darrach Store (7K-A-101), the John Powell Plantation (7K-C-203H), and the Richard Whitehart Plantation (7K-C-203C) sites; and the Wilmington Boulevard (now Martin Luther King Boulevard) project in Wilmington, New Castle County (**Figure 1**). The Laban Rogers Site investigations were funded by Carl M. Freeman Communities, LLC; all the others were funded by the Delaware Department of Transportation (DELDOT). These flotation results are compared with discoveries from additional archaeological sites in Delaware and the region.

This report demonstrates that flotation deserves to be an integral part of historic site excavations. It clearly shows that a wealth of valuable information about historic foodways and medicine can be obtained through flotation. Also apparent is the need for detailed descriptions of flotation methods and equipment and for better use of the flotation results.

A discussion of the implications of this work to the future of historical archaeology is also offered. The accumulating knowledge of historic Delaware plants is of much greater importance than is generally recognized. The recovered seeds are also of great value. Some historic seeds remain vital and can be germinated. Others are potential sources of DNA, which will be of great scientific value.

It should be noted that this paper presents information on historic use of plant-based medicine. It is not medical advice. One should consult his health care professional before taking any medicine.

The research, statements, perspectives and views of this report are the responsibility of the author and do not necessarily reflect an opinion or endorsement on the part of DELDOT, Carl M. Freeman Communities, LLC or anyone else.

This paper is dedicated to the memory of the late, great Delaware archaeologist Edward "Ned" Heite (1937- 2005). Ned believed in getting the most information possible from the sites he dug. He had the wisdom to bring the author to Delaware to process large quantities of flotation soil at the Bloomsbury and Laban Rogers Sites. Ned used flotation from wells and other features at these two extremely important Delaware historic sites to recover a variety of information about plant remains, faunal remains, and small artifacts.

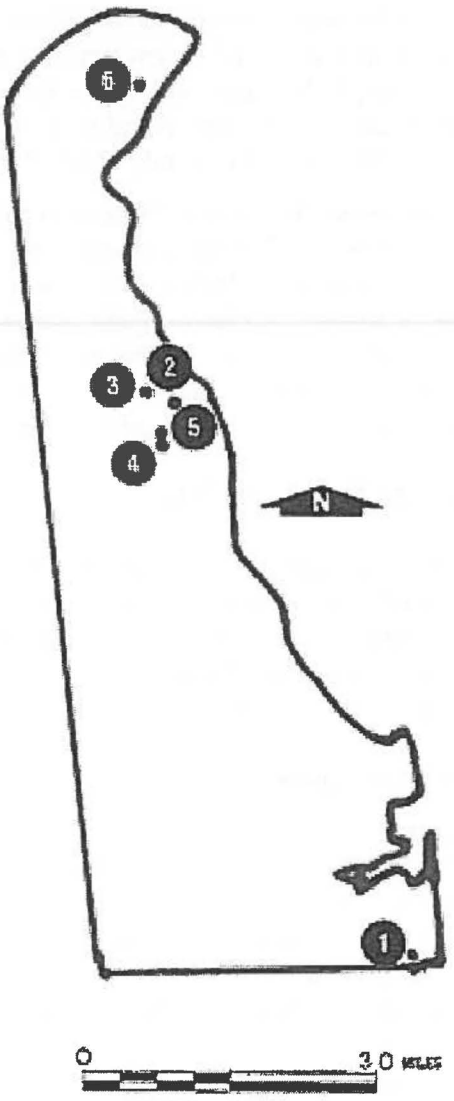


Figure 1: *Map of Delaware showing the location of the six Delaware historic archaeological sites discussed in this report:*

1. Laban Rogers, 2. Bloomsbury, 3.Darrach Store, 4. John Powell Plantation, 5. Richard Whitehart Plantation, 6. Wilmington Boulevard

FLOTATION: PHILOSOPHY, EQUIPMENT, AND METHODS

Prehistoric archaeologists have long known that the types and sizes of artifacts and ecofacts (animal and plant remains) that they recover from sites are directly related to the techniques they employ. This was best detailed by prehistorian Stuart Struever in 1968. While excavating the Apple Creek Site in Illinois, his faunal list initially consisted of deer bones and large fish scales, which all happened to be bigger than his screen openings. Recognizing that his team was missing something, Struever undertook experiments in flotation. He then recovered a world of fauna including a river of small fish scales and mollusks, not to mention small artifacts, seeds and nut fragments, and consequently changed how archaeologists do prehistory (Struever 1968).

Flotation uses water and fine screens to recover small seeds, bone fragments, fish scales, beads, and other tiny artifacts. Most flotation in Delaware has used drum flotation devices that are known as the "Delaware Park" type and were designed and built by the author. Since the first device of this type was built for the Delaware Park Site in 1981, over two hundred of these devices have been sold to museums and archaeologists throughout Delaware and the United

States. These flotation systems use water flowing under pressure to reduce the flotation soil sample into two components, a "*Heavy Fraction*" and a "*Light Fraction*". The heavy fraction is collected in a piece of nylon window screening and recovers small artifacts such as beads and pins, bones, fish scales, and other non-floating remains. The light fraction uses fine screens or filters to capture floating floral materials such as seeds, fish scales, and other lighter than water objects (Thomas 1981; Sandy 1985, 2002).

The research oriented historical archaeologists working in Delaware choose from a variety of specialized analytical methods and techniques. The research questions they are examining drive the methods selected. Flotation is but one of the techniques through which historic data can be acquired. Archaeologists must consider the labor and other costs involved, and this limits the specialized studies in the analysis of a historic site. This paper hopes to highlight the potential for historic archaeobotany in Delaware and elsewhere, and press for the regular inclusion of flotation at historic site excavations.

SITES AND SAMPLING

While it may not be complete, this report details almost all of the flotation studies that have been conducted at historic archaeological sites in all three Counties of Delaware. Most historic site investigations have not included flotation (e.g. Shaffer et al. 1988; Catts, Hodny and Custer 1989; Bachman and Catts 1990; Catts and Custer 1990; Hoseth *et al.* 1990; Hoseth, Catts and Tinsman 1994; LeeDecker *et al.* 1995).

The Laban Rogers Site

The Laban Rogers Site in Williamsville, Sussex County was occupied before 1823 (**Figure 1**). The archaeological investigations uncovered numerous features and deposits from a rural farmstead that was also involved with iron making. Exceptionally large flotation samples were taken from the three wells, two charcoal filled pits and a possible privy. Forty-two samples were processed; total volume was a remarkable 3888 liters. All samples were sifted in the field through one-quarter-inch mesh hardware cloth before the soil was bagged for flotation. Floral specimens recovered in the field screens were inventoried separately and included squash seeds, a seed from a black gum tree, a possible dogwood seed, peach pits and a seed pod fragment, probably of catalpa. Flotation recovered small-sized artifacts included pins, pin fragments, a glass bead and wire staples. Also recovered were numerous small bones, including fish bone, and thousands of fish scales of all sizes. The long list of floral remains includes fruits like peach, pear, black cherry, and berries; crops like watermelon, bean, and squash; and many species of weedy garden plants. Bayberry seeds (technically "drupes") were recovered by the thousands from the oldest well (Sandy 2004a; Table 1).

The Bloomsbury Site

The Bloomsbury Site, in Duck Creek Hundred, Kent County, had numerous historic features and deposits relating to a house which was occupied from around 1750 to 1814. It was occupied by tenants, some of whom were members of documented Native American families (Heite *et al.* 2001). The flotation program was an integral part of the excavations at the Bloomsbury Site. Thirty-eight samples, with a volume totaling 287 liters were processed from 19 different features. Artifacts recovered through flotation included pins and black glass beads. Flotation also recovered thousands of small fish scales and bones (Heite *et al.* 2001; Figure 1).

Flora from the Bloomsbury Site included corn (**Figure 2**), beans, cherry, peach, raspberries, elderberry, and blueberry. "Weeds" include purslane, carpetweed, lamb's quarters, oxalis, poke, jimson, and smartweed. Exceptional numbers of a large variety of seeds were recovered from the bottom of the wells at Bloomsbury (Heite *et al.* 2001; **Table 1**).

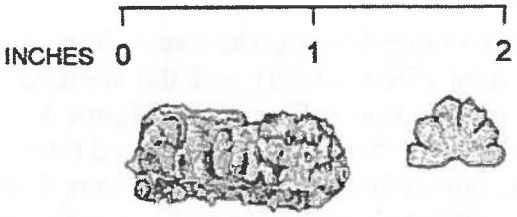


Figure 2: *Corn Cob from well at Bloomsbury (Heite et al. 2001: Figure 125).*

The John Darrach Store Site

Flotation was included in investigations of the John Darrach Store Site in Smyrna, Kent County. John Darrach operated the store on the road to Duck Creek Landing between 1778 and 1805. The store was converted into a residence and demolished in 1860. This study included 22 flotation samples from 11 different features, which included wells, although the bottoms of the wells were not reached (De Cunzo *et al.* 1992:72; Figures 1 and 3). **Figure 3** is an artist's conception of how the John Darrach Store looked around the end of the eighteenth century (De Cunzo *et al.* 1992).

Food plants recovered from the John Darrach Store included raspberries/blackberries, blueberries, and corn. Weedy plants, many of which also have food and/or medicinal uses include: carpetweed, chenopodium, copperleaf, crabgrass, dock, flatsedge, knotweed, oxalis, pigweed, purslane, ragweed, and smartweed (De Cunzo *et al.* 1992:72; **Table 1**).

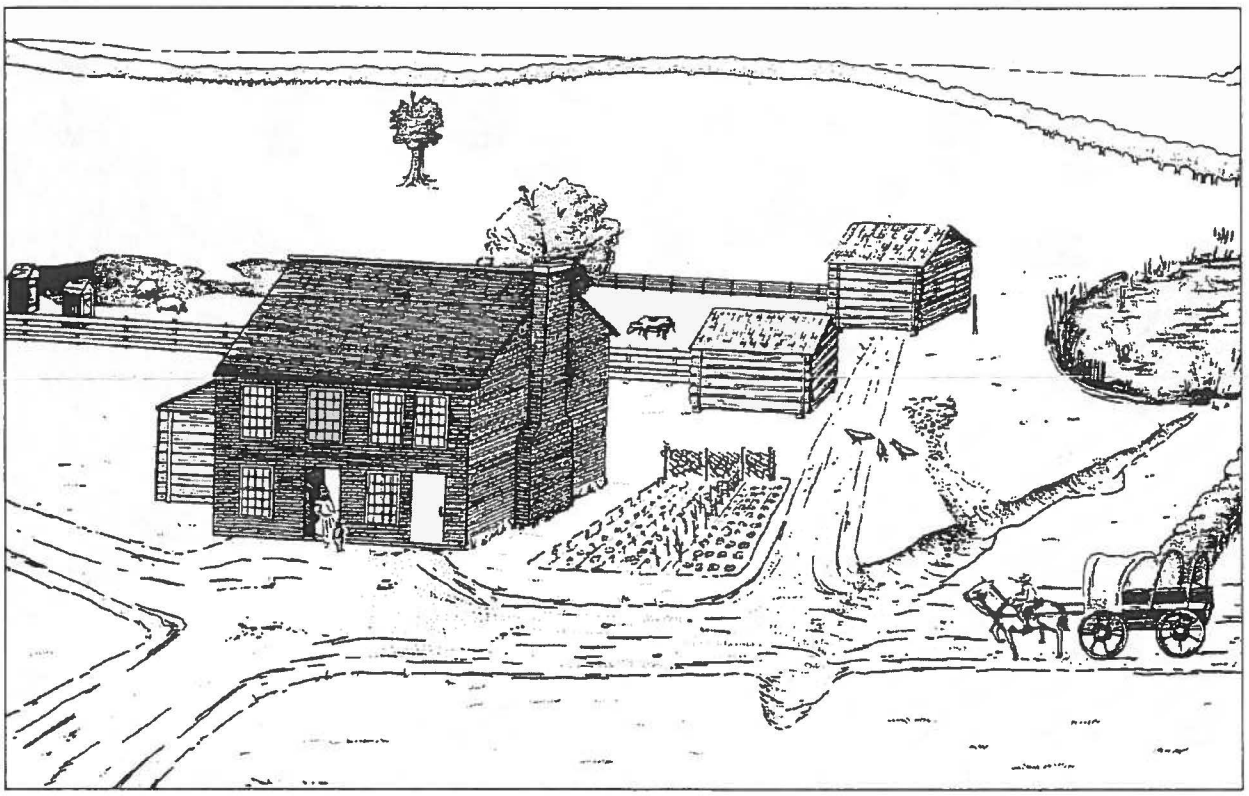


Figure 3: *Artist's Reconstruction of the John Darrach Store (from De Cunzo et al. 1992).*

The John Powell Plantation (7K-C-203H) and the Richard Whitehart Plantation (7K-C-203C) Sites

Two other historic site excavations in the Smyrna area of Kent County, the John Powell Plantation (7K-C-203H) and the Richard Whitehart Plantation (7K-C-203C) sites, produced relevant flotation information (**Figure 1**). The John Powell Plantation was occupied by the Powell family from 1691 to 1721 and then by tenants from 1722 to 1735. There was an earthfast house, outbuildings, and a well. Figure 4 shows an artist's view of the Powell Plantation around 1720. Outlined "ghost" images are earlier structures. The nearby Richard Whitehart Plantation was occupied from c. 1681 to 1701 and included a small post-in-ground house. **Figure 4** is an artist's conception of how the Richard Whitehart plantation looked around 1690 (Grettler *et al.* 1995).

Drawbacks with the report and analysis limit the utility of recorded flotation data from these sites. Sample size, processing and analysis methods are not stated. At the John Powell Plantation, 10 features had botanical remains, while 13 others had no flora. Nine samples are reported from the well (Grettler *et al.* 1995:117, Table 14). A summary table of the features tested was included as an appendix. Unidentified spores were found in most of the well samples,

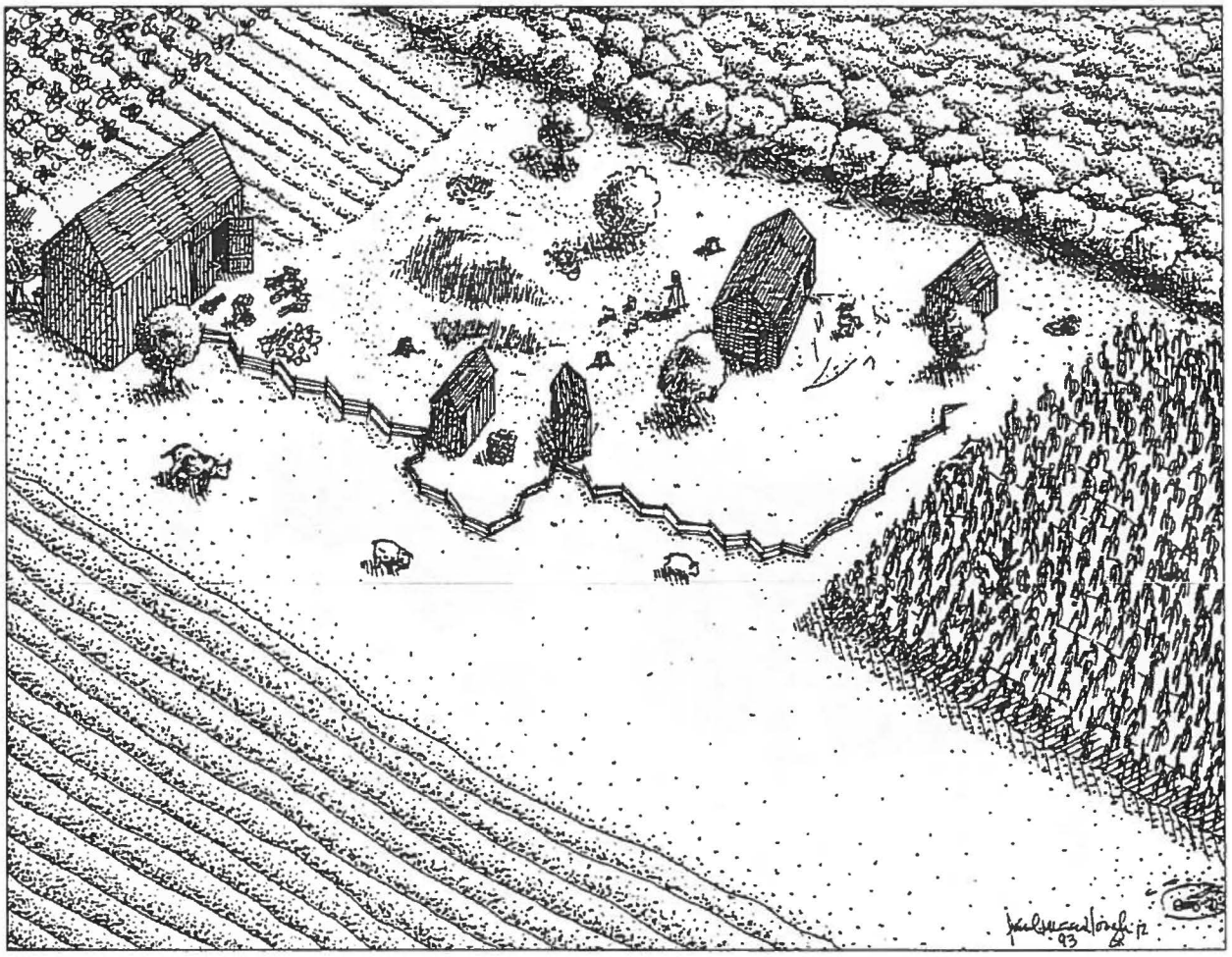


Figure 4: *Artist's Reconstruction of the Richard Whitehart Plantation (from Grettler et al. 1995:87).*

but were not listed in the summary table (Grettler *et al.* 1995: Table 14, and Appendix V). **Figure 5** is an artist's conception of how the Richard Whitehart plantation looked around 1720 (Grettler *et al.* 1995). At the Richard Whitehart Plantation, the well, sheet midden, and two trash pits were tested with flotation samples of undisclosed size (Grettler *et al.* 1995: 58-67). Flora consisted of 38 different species, including disturbed land weeds, like crabgrass, goose grass, poke, vetch, nightshade, ragweed, smartweed, and goosefoot, all common on plowed fields. Edible species include grape, groundcherry, sage, sunflower, and sorghum (Grettler *et al.* 1995:67, Table 6).

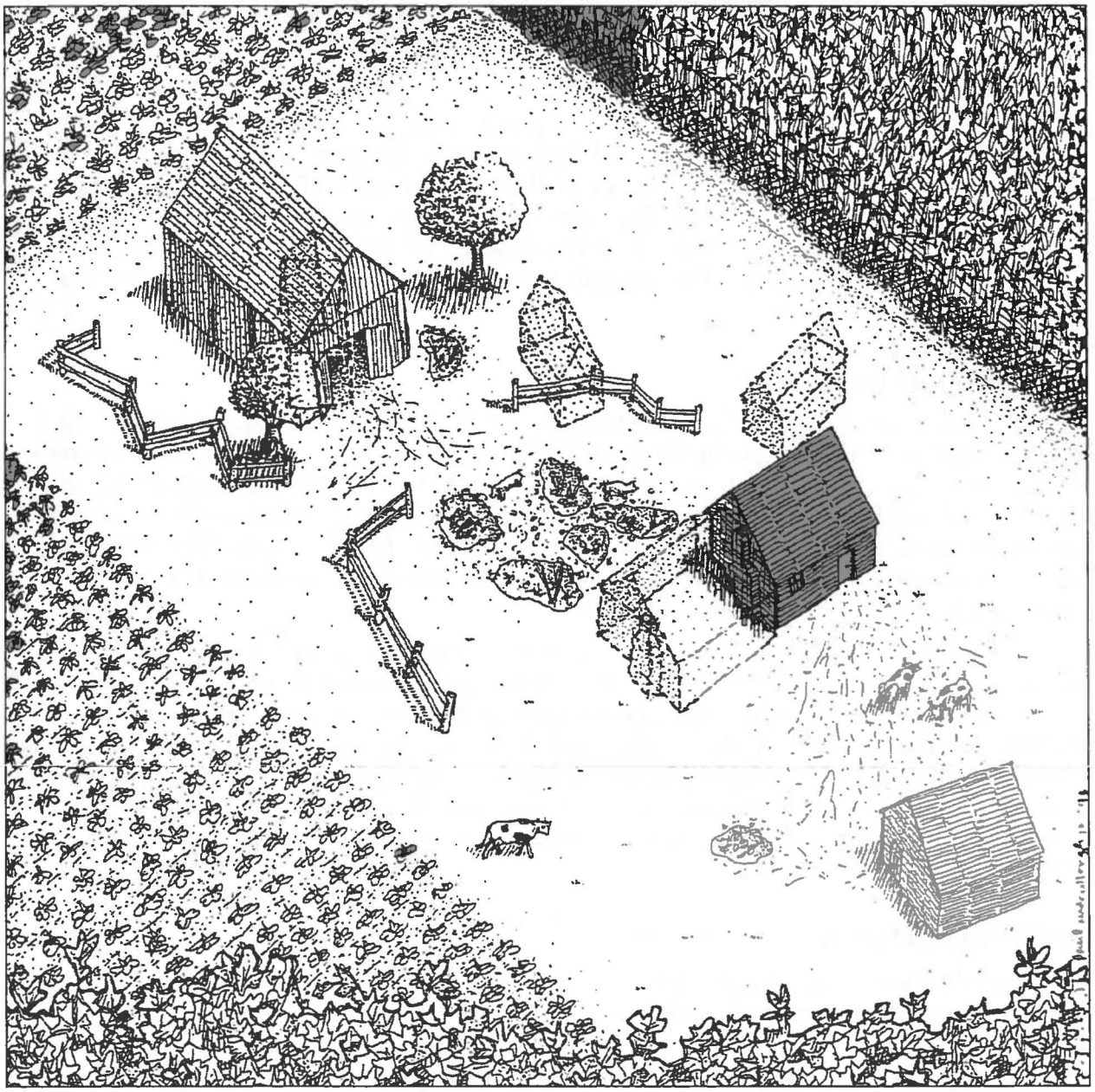


Figure 5: *Artist's Reconstruction of the John Powell Plantation Circa 1720 Tenant Occupation (from Grettler et al. 1995:154).*

Wilmington Boulevard

The excavations of the Wilmington Boulevard (now Martin Luther King Boulevard) project in New Castle County involved a linear R.O.W. that included several sites spanning the post Revolutionary War period through 1900 (**Figure 1**). The Wilmington Boulevard report was an early example of flotation in Delaware historic archaeology (Klein *et al.* 1984). This project benefited from the equipment and methods developed at the Delaware Park Site (Thomas 1981; Sandy 2002). Forty-three samples with a total volume of 183 liters were processed. Flotation samples taken from buried surfaces and deposits were dubbed "Occupation Levels and Deposits". Features were grouped as "Pre-Industrial" or "Industrial Period and Non Analytical Mixed Contexts". Results were presented only in text form (Klein *et al.* 1984: Appendices). In order to interpret the results from Wilmington Boulevard, Tables 2, 3, and 4 were developed; they are included as an Appendix to this report.

A tremendous number of seeds from 18 species were recovered, identified and counted. Tens of thousands of seeds were recovered from the privy features, far more than from all the other historic sites in Delaware (Kline *et al.*1984). A variety of domesticated fruits were identified. Apple, raspberry, cherry, fig, grape, peach, plum and watermelon were particularly plentiful in the "Pre-Industrial" features, as was pepper. Edible "weeds" like chenopodium and pigweed were also identified. One sample contained two imported "exotics", coconut and peanut (**Table 1**).

Other Delaware Historic Sites

Two other Delaware historic sites also involved flotation. One of these reports dealt with the investigation of Block 1184 in Wilmington, New Castle County. The flotation analysis was limited to 13 one-liter samples, and only 156 floral specimens were recovered (LeeDecker *et al.*1990). Although this site's information is not included in the cumulative Table 1, the results are referenced in the discussion to follow. There was some flotation at the John Ruth Inn Site, also in New Castle County , but very little data is provided in the report and will not be further referenced (Coleman *et al.*1990:69, 150-151).

Following the completion of the first version of this paper, I became aware of a report on archaeological investigations of Block 1191 in Wilmington (Beidleman *et al.* 1986). That report includes seed analysis of many small samples taken from historic features. It was not possible to include the Block 1191 in this paper, and it is not discussed further. Future historic archaeobotany studies in Delaware should synthesize, summarize, and present the Block 1191 seed data. A wide variety of seeds were recovered including apple, apricot, cherries, coconut, grape, ground cherry, peanuts, plums, purslane, raspberry, watermelon and many others (Beidleman *et al.* 1986).

IDENTIFICATION AND ANALYSIS

Most flotation studies to date have focused on prehistoric sites. Flotation studies on historic sites have been scattered and inconsistent and are sometimes included only as tables or appendices. Often, little or no discussion of the implications of the results is included. When flotation information is included in reports, it is rarely discussed in terms of preservation variables, the importance of the plants, and the many other factors that should enter the discussion. Exceptions compare results with those from several other historic sites. A problem with comparing flotation data between historic sites is that sampling, processing methods, and

equipment is sometimes not addressed. Small samples are another shortcoming, with a one-liter sample unfortunately all too common.

In analyzing the ecofacts from any archaeological site, a number of questions need to be considered. With respect to floral remains, these include: "How are the recovered remains related to the occupation of the site?", "Were these plants used by the site's inhabitants for food or medicine?", and "How have variables such as soil acidity, moisture, and bioturbation affected the preservation of plant remains?"

At the Delaware historic sites, the recovered floral remains can be divided into two general groups, those that were exploited by the site inhabitants and those simply present on the site that got introduced to the features during and after its occupation. The first group can detail historic food and medicinal use of plants. The second group provides information about the historic environment. Cultigens like pear and squash are clearly of the first type. Clearly food plants like raspberry, blackberry, apple, cherry, blueberry, elderberry, peach, pear, plum, nuts, sunflower, and watermelon were important throughout much of Delaware's history. Many of these food plants also have medicinal uses.

However, many "weeds" and bushes, like bayberry, jimson, witch hazel, and others have food and/or medicinal uses. Hence, it is harder to determine how they were introduced to the features. By detailing the role of these plants in historic foodways and folk medicine, the potential for their historic use can be assessed.

Another line of information comes from comparing the remains with those of other historic sites of the same vintage. The more times a particular plant is recovered from good archaeological contexts, the more we can assume it was significant.

Preliminary analysis hints at a possible benefit of Wilmington's superb transportation network: a diversity of foods like apples, coconut, plums, peppers, and watermelon. Of course, this plethora of species could also be related to site age (the others are generally older) or refuse disposal patterns. can reflect the deforestation that the city underwent. Some of these plants indicate the ill kept nature of yards and/or weeds at the yard boundary and fence lines.

Also, the Delaware historic site flotation reports do not always used consistent plant names and some scientific names have since changed. Edible, domesticated cherries have been grouped as "cherry" in Table 1 while wild cherries have been grouped as "choke cherry." Amaranths have been placed under "pigweed." Raspberries, blackberries, and the other members of the genus *Rubus* are all grouped as "Berries (*Rubus*)."

The focus of this paper is floral and fungal remains from Delaware historic sites. It should not be overlooked that large-scale flotation recovers important small artifacts. Flotation of large quantities of soil, though, is needed to recover important small artifacts such as beads, pins and other very small things forgotten.

Recovery of small bones and fish scales has greatly expanded through flotation. The recovery of thousands of scales and small fish bones permits a better understanding of the diet of the inhabitants that would not have been possible without the aid of flotation. They present an interesting resource to those studying the history of the fish of Delaware.

Table 1 summarizes the floral remains from the Laban Rogers, Bloomsbury, Darrach Store, Powell Plantation, Whitehart Plantation, and Wilmington Boulevard sites in an attempt to show the relative ubiquity of seeds from Delaware historic sites. This ubiquity table is based on 42 samples from Laban Rogers, 38 samples from Bloomsbury, 11 samples at the Darrach Store, 10

features with seeds at John Powell Plantation, 4 features with seeds at Richard Whitehart Plantation, and 43 samples at Wilmington Boulevard. There are several complicating factors that limit the utility of the flotation data from the Powell and Whitehart Plantations. Fungi are inconsistently reported. Seed lists are not always given for individual flotation samples, so the percentages shown in the ubiquity table is based on summaries for features, and not on all the samples from each feature, like it was for the other sites.

Table 1: *This table shows the percentage of flotation samples containing seeds from the Laban Rogers Site, Bloomsbury Site, the John Darrach Store and Wilmington Boulevard, and percentage of features with seeds at the John Powell Plantation and the Richard Whitehart Plantation (Klein et al. 1984; De Cunzo et al. 1992; Grettler et a.l 1995; Heite et al. 2001; Sandy 2004a;).*

PLANT	ROGERS	BLOOMSBURY	DARRACH	POWELL	WHITEHART	WILMINGTON BLVD
Acorn	0	0	0	0	0	2
Alder	0	0	0	20	0	0
Apple	0	0	0	0	0	12
Arrowwood	0	3	0	20	0	0
Bayberry	43	0	0	20	0	0
Bean	5	5	0	0	0	0
Bedstraw	0	0	0	10	25	0
Berries (*Rubus*)	48	34	9	10	0	70
Bittersweet	0	0	0	0	25	0
Black gum	7	0	0	0	0	0
Blueberry	0	3	9	10	0	0
Bristlegrass	0	24	0	40	25	0
Buckhorn	0	0	0	0	25	0
Bulrush	5	0	0	10	25	0
Carpetweed	100	84	82	0	0	0
Checkermallow	0	0	0	10	0	0
Chenopodium	36	79	73	20	50	58
Cherry	5	3	0	0	0	30
Chickory	2	0	0	0	0	0
Chokecherry	2	3*	0	0	25	0
Clammyweed	0	0	0	0	25	0
Clover	0	3	0	0	0	0
Coconut	0	0	0	0	0	2
Collomia	0	0	0	10	0	0
Copperleaf	0	13	45	20	0	0
Corn	0	3	9	10	0	0
Crabgrass	10	8	9	10	50	0
Dock	2	0	45	0	0	0
Creosote	0	0	0	10	0	0

Table 1: (CONTINUED) *= generic classification **= see text

PLANT	ROGERS	BLOOMSBURY	DARRACH	POWELL	WHITEHART	WILMINGTON BLVD
Elderberry	0	16	0	0	0	0
Elm	0	0	0	0	0	7
False pennyroyal	0	0	0	20	0	0
False Solomon's seal	0	0	0	0	25	0
Fiddleneck	0	0	0	0	25	0
Fig	0	0	0	0	0	42
Flatsedge	2	3	9	20	0	0
Gayfeather	0	0	0	0	50	0
Geranium	0	0	0	10	0	0
Goosegrass	26	8	0	10	25	0
Grama	0	8	0	0	0	0
Grape	19	3	0	0	25	37
Grass	21	3	0	30	25	0
Greenbrier	0	0	0	10	0	0
Groundcherry	7	0	0	0	25	0
Hawkweed	0	11	0	0	0	0
Jimson	73	34	0	10	0	0
Knotweed	2	0	9	0	0	0
Lead plant	0	0	0	10	0	0
Lotus	0	0	0	10	0	0
Milkpea	0	0	0	0	25	0
Milkweed	2	0	0	0	0	0
Mole weed	0	0	0	0	25	0
Nightshade	10	13	0	0	50	0
Nut	0	5	0	10	0	2
Oxalis	0	13	27**	0	25	0
Panicum	0	0	0	20	0	0
Peach	2	3	9	0	0	30
Peanut	0	0	0	0	0	2
Pear	5	0	0	0	0	5
Peavine	0	0	0	0	25	0
Pellitory	0	0	0	10	0	0
Pepper	0	0	0	0	0	16
Peppervine	0	0	0	10	0	0
Pepperweed	0	9	0	0	0	0
Pigweed	19	3	27	10	25	44
Plum	0	0	0	0	0	12
Prickly poppy	5	0	0	0	0	0
Poke	29	3	36	10	75	0

Table 1: (CONTINUED) *= generic classification **= see text

PLANT	ROGERS	BLOOMSBURY	DARRACH	POWELL	WHITEHART	WILMINGTON BLVD
Prickly mallow	0	0	0	10	0	0
Purslane	81	87	64	0	0	0
Ragweed	17	3	0	20	25	0
Rush	0	0	0	10	0	0
Sage	0	0	0	0	25	0
Saltbush	0	0	0	0	25	0
Sea purslane	0	0	0	40	0	0
Sheep sorrel	0	0	0	10	0	0
Skullcap	0	3	0	10	0	0
Smartweed	45	32	64	20	25	0
Soapwort	0	0	0	10	0	0
Solomon's seal	0	0	0	10	25	0
Sorghum	0	0	0	0	25	0
Spikerush	7	0	0	10	0	0
Spurge	0	3	0	20	0	0
Spurry	0	0	0	10	0	0
Squash	2	0	0	0	0	2
Staghorn sumac	0	0	0	0	25	0
St. Johnswort	0	0	0	20	0	0
Sumpweed	0	0	0	10	0	0
Sunflower	2	0	0	0	25	0
Sweet clover	0	3	0	0	0	0
Sweetgum	0	0	0	0	25	0
Tansymustard	0	0	0	10	0	0
Tarweed	0	0	0	10	0	0
Tearthumb	0	5	0	0	0	0
Verbena	2	0	0	0	0	0
Vetch	0	0	0	0	50	0
Viburnum	0	0	0	0	25	0
Violet	7	0	0	10	0	0
Wahoo	0	0	0	0	25	0
Water arum	0	0	0	10	0	0
Watermelon	2	0	0	0	0	33
Water smartweed	0	3	0	0	0	0
Wild lettuce	2	0	0	0	25	0
Winterberry	0	0	0	10	0	0
Wintercress	0	0	0	10	0	0
Witch hazel	0	0	0	0	25	0
Unidentified	45	29	0	70	50	0
Sclerotia	100	100	91	10+**	?	0
Water primrose	0	0	0	10	0	0

IDENTIFIED PLANTS AND FUNGI

Information was gathered on the types of environments frequented by the plants identified through flotation, and a variety of sources were examined to ascertain the potential of these plants for providing food, medicine and dyes (Safford 1917; Speck 1941; Keeler 1969; Androsko 1971; USDA 1971; Hedrick 1972; Densmore 1974; Peterson 1977; Petrides 1977; Tantaquidgeon 1977; Erichsen-Brown 1979; Kavasch 1981; Sandy 1985, 2002; Moerman 1986; Mrozowski 1987; Niering and Olmstead 1988; McWeeney 1989; Braun 1989; Foster and Duke 1990; Inashima 1990; Hutchens 1991; Wacker and Clemens 1995; Heinerman 1996; Miczak 1999; Raymer Fuss and Rhodes 2000; Schonbeck 2003; Natural Resources Conservation Service n.d).

Acorns (*Quercus sp.*) of many oak species are edible after they have been boiled or roasted (Hedrick 1972:481). Acorn was present in one Wilmington Boulevard sample (Klein *et al.* 1984).

Alders (*Alnus sp.*) include a number of small trees that grow in Delaware (Petrides 1972: 229). Alders were identified in two of the flotation samples from the John Powell Plantation (Grettler *et al.* 1995).

Apples (*Pumila malus*) grow up to 50 feet high and produce fruit from September to November (Petrides 1972: 267). Apples were thought to have been introduced from Europe and Asia, however Verranzano claimed to find apples in Massachusetts in 1524. Cultivation of apples was widespread in the American Colonies by 1650 (Hedrick 1972: 476-478). Apple seeds were found in several Wilmington Boulevard samples, including three from "Preindustrial" contexts (Klein *et al.* 1984).

Arrowwood (*Viburnum dentatum)*, or northern arrowwood, is a small tree that was the source for arrow shafts. It produces fruit from July through September (Petrides 1972: 93). Other species of *Viburnum* are sources of food and medicine to many Native American groups (Peterson 1977: 178; Moerman 1986: 511-513). A few seeds were recovered from the Bloomsbury and John Powell Plantation sites (Grettler *et al.* 1995; Heite *et al.* 2001).

Bayberry (*Myrica sp.)*, also known as wax myrtle or candleberry, is a shrub and small tree that grows over much of the east coast. American bayberry (*Myrica cerifera)* and its relatives have evergreen leaves with a balsamic aroma. The small "berries" (actually drupes) are coated with wax. At the Laban Rogers site, all three wells had bayberry drupes or "seeds", thousands of specimens were identified. Bayberry was found in 43 percent of the contexts examined. This is by far the strongest evidence yet for historic exploitation of bayberry in Delaware. Two bayberry "seeds" were found at the John Powell Plantation: a single specimen of bayberry was recovered from each of two daub/trash pits. Bayberry also has been recovered from 15 prehistoric sites in Delaware, New York, New Jersey, Rhode Island, and Virginia (Sandy 2001a, 2002).

Many different parts of the bayberry plant can be used for a variety of food and medicinal purposes. *Medicinal Plants of Native America* contains many references to the use of bayberry by Native American groups throughout the east (Moerman 1986: 301). Bayberry was an important source of wax in Precontact and Colonial America. Since honeybees are European imports, early colonists needed this source of wax for candles and waterproofing. To produce a fragrant wax, bayberries are boiled (Peterson 1977: 206). The resulting wax has anti-microbial properties.

Aromatherapy in a sauna or sweatbath is another possible use for bayberry leaves and berries. Colonists made full use of *Myrica's* remarkable properties. It remained a standard for treating a

variety of ailments, well into the twentieth century (e.g. *The American Materia Medica, Therapeutics and Pharmacognosy 1919).* It is still sold by herbal medicine practitioners to treat ailments like diarrhea, colitis, intestinal parasites, sore throats, colds, the flu, and acute fevers. According to one expert, "Bayberry is considered one of the most useful in the Medical Herbal practice. Its popularity has had respect for generations." (Hutchens 1991:28). Modern medical science is conducting numerous research projects on the various chemicals in *Myrica.*

Beans (*Phaseolus sp.*) spread their way north into the Middle Atlantic region during the prehistoric Woodland Period (Hart 1999). Beans were recovered from one context in each of two wells at the Laban Rogers Site. Two charred specimens were recovered from Feature 5 at Bloomsbury. Beans were recovered from five percent of contexts sampled at these two sites (Heite *et al.* 2001; Sandy 2004a).

Bedstraw (*Galium sp.)* includes widespread perennial and annual herbs (USDA 1971: 352-355). From Europe, bedstraw is naturalized in North America. Bedstraw seed is used as a coffee substitute in Sweden. The plant was also used in cheese making, and for a summer drink (Hedrick 1972: 285). It was identified from one sample each at the John Powell Plantation and the Richard Whitehart Plantation (Grettler *et al.* 1995).

Berries within the genus *Rubus* include about 400 hundred similar species: raspberries, blackberries, dewberries, and others. They produce delicious fruits from July through October (Peterson 1977: 184). There are numerous medicinal uses for various parts of these plants. The berries are a diarrhea remedy. A tea made from the leaves is used to treat ailments like blood impurities, sluggish liver, childbirth, and is used as a wash for mouth and skin sores (Densmore 1974:292; Tantaquidgeon 1977: 132-133; Heinerman 1996: 70-71; Miczak 1999: 38-39,116). The establishment of household yard fences encouraged the spread of weedy vines like blackberry (LeeDecker *et al.* 1990: 174-180; Mrozowski 1987). These fences also made the cultivation of domestic berries possible, since the fencing protected the plants from grazing farm animals.

Raspberry/blackberry seeds were found in most of the Laban Rogers Site features and in 48 percent of the contexts sampled (Sandy 2004). Thirty-four percent of the samples at Bloomsbury, including five of the features, yielded raspberry seeds in low numbers (Heite *et al.* 2001). At the John Powell Plantation, raspberry was recovered only from the most seed-prolific feature, well H39 (Grettler *et al.* 1995). They were also found in one context at the Darrach Store Site (De Cunzo *et al.* 1992). At Wilmington Boulevard, raspberry seeds were recovered by the thousands from almost all the feature samples (Klein *et al.* 1984). Blackberry seeds were the most numerous seed at Block 1184 in Wilmington (LeeDecker *et al.* 1990).

Bittersweet (*Celastrus scandens*), also known as staff vine and waxwork, is a widespread twining shrub (Braun 1989:243, 313). It was a source of food to the Chippewa, who ate the tender branches. The thick bark was rendered sweetish and palatable when boiled, according to an 1870's USDA report (Hedrick 1972). It should not be confused with another bittersweet, or nightshade (*Solanum*) which is poisonous. It was identified from one sample at the Richard Whitehart Plantation Site (Grettler *et al.* 1995).

Blackgum (*Nysaa sp*), or sour gum grows in swamps and produces a distinctive large seed from August through October. Its lumber is favored for furniture, boxes, and pulp. The berry-like fruits are a favorite of wildlife (Petrides 1972: 270). A few of these seeds were found in three features at the Laban Rogers Site (Sandy 2004a).

Blueberries (*Vaccinium sp.*) include many species of acid-loving plants in the heath family. Fruits are available from late July into September (Petrides 1972: 277-279). Wild blueberries are native to the Delaware coastal plain. A blueberry seed was found in the bottom of Feature 18 at the Bloomsbury Site. At the Darrach Store and Powell Plantation sites, blueberry was found in a few contexts. It was also found at Block 1184 site in Wilmington (LeeDecker *et al.* 1990: 174-180). Blueberries are commonly found on nineteenth-century domestic sites in the east (Raymer, Fuss, and Rhodes 2000: 225).

Bristlegrass (*Setaria sp.*) is a weed believed to be a European import (USDA 1971: 84-85). The Navaho reportedly rubbed the seeds on facial blemishes (Moerman 1986: 451). The seeds are also edible. Bristlegrass was reported in three samples from three different Bloomsbury Site features, from four features at John Powell Plantation and one at the Richard Whitehart Plantation (Grettler *et al.* 1995 Heite *et al.* 2001). It also was found at Block 1184 in Wilmington (Klein *et al.* 1984).

Buckhorn (*Plantago lanceolata*), also called narrow leaf plantain and buckhorn plantain, is a widespread weed (Natural Resources n.d.). Plantain was known as "White Man's Foot" because it was an import that closely followed settlers. Native people made use of the plant's antiseptic properties to treat wounds (Miczak 1999). Buckhorn was identified from one Richard Whitehart Plantation Site sample (Grettler *et al.* 1995).

Bulrush (*Scirpus sp.*) includes many sedges that frequent salt marshes (Niering and Olmstead 1988: 486). The tips of the rootstock of great bulrush (*Scirpus validus and S. acutus)* are used like potatoes or made into flour. The pollen and seeds can also be ground into flour. The young shoots are used for a salad green or cooked vegetable (Hedrick 1972: 526; Densmore 1974:293; Peterson 1977: 230). Two contexts near the bottom of Feature 269 at the Laban Rogers Site produced bulrush seeds. A single bulrush seed was recovered at the John Powell Plantation. At the nearby Richard Whitehart Plantation two bulrush seeds came from the sheet midden (Grettler *et al.* 1995).

Carpetweed (*Mollugo verticillata*) is an annual "weed" that can be used as a potherb. It may be linked to the spread of prehistoric horticulture (Sandy 1985: 133). It was naturalized from Central America and is a common weed in fields and a variety of other settings (LeeDecker *et al.* 1990: 182). The seeds are ubiquitous on archaeological sites throughout the region. Carpetweed was identified, usually by hundreds of specimens, in all 42 flotation samples from the Laban Rogers Site. Carpetweed was found in 32 of the 38 flotation samples (84%) from the Bloomsbury Site, these include samples from all 20 features examined. Carpetweed was found in nine of 11 features (82%) at the John Darrach Store site and also on Wilmington Block 1184 (De Cunzo *et al.* 1992: 389; LeeDecker *et al.* 1990). Carpetweed was found in one of two samples at New Jersey's historic Atsion Mansion and a sample from a Virginia canal boat (Sandy 2001c, 2001d).

Checkermallow (*Sidala neomexicana*) was reported from one feature at the John Powell Plantation (Grettler *et al.* 1995).

Chenopodium (*Chenopodium sps.*) also called lamb's-quarters and goosefoot, are similar members of a large family of annual herbs that go to seed from June to October. Each plant can produce thousands of seeds and some can persist on the plant into the winter. They grow in a variety of habitats including fields, meadows, clearings, and disturbed soils (USDA 1971; Kavasch 1981: 44). Chenopodium was considered to be a healthful food by many Native American groups. Its leaves were used as a green and were parboiled. Seeds were ground into meal and baked into bread, sometimes being mixed with cornmeal. The root was brewed into

tea, and used for kidney ailments (Tantaquidgeon 1977: 128; Weiner 1980: 177; Kavasch 1981: 44; Sandy 1985: 135). Other medicinal uses include as an antidiarrheal, a salve for burns, a stomach aid, and as a gynecological aid (Moerman 1986: 114-115).

Chenopodium seeds were identified in 36 percent of the Laban Rogers Site flotation samples. These included all but two of the features examined. Lamb's-quarters seeds were recovered from 18 of the Bloomsbury Site features (79% of samples), but were not present in great numbers. The seeds of its cousin, goosefoot was also found in small numbers in four of the Bloomsbury features. Chenopodium was recovered from eight features (82% of samples) at the Darrach Store (De Cunzo *et al.* 1992: 389). A lone seed of lambsquarter was identified at the Block 1184 Site in Wilmington (LeeDecker *et al.* 1990: 174-180). At the John Powell Plantation in Kent County, two species of chenopodium were found in three of the 10 features with seeds. One seed came from a trash midden at the Richard Whitehart Plantation (Grettler *et al.* 1995). It was also found in a sample from a canal boat in Marymont, Virginia (Sandy 2001d). Chenopodium seeds are arguably the most ubiquitous seed recovered from prehistoric sites in the Northeast (e.g. Sandy 1985, 1989, 1991, 1992; Crowley and Sandy 1992; Camissa *et al.* 1993).

Cherry (*Prunus serotina*) trees produce delicious dark fruit from July through October (Peterson 1977:218). Flotation retrieved black cherry pits from one Laban Rogers feature. Unspecified cherries were retrieved from one Bloomsbury context. Sweet cherry was found in 30 percent of the Wilmington Boulevard contexts (Klein *et al.* 1984).

Chickory (*Cichorium intybus*) is a perennial or biennial dandelion-like "weed" common along roadsides and in lawns. It flowers from June through October and is distributed through most of the country, including all of the east north of Georgia (USDA 1971:394). The roots can be ground into an excellent coffee substitute. The leaves supply salad greens and a cooked vegetable (Peterson 1977: 144; Hedrick 1972). Extracts of the root or stems have diuretic and laxative properties (Foster and Duke 1990: 198). Chickory seed was identified from one context of the robbed well at the Laban Rogers Site (Heite *et al.* 2001).

Choke Cherry (*Prunus virginianus*) bark is a traditional and modern ingredient in cough syrups. It was known as the "excrement tree" to the Delaware, who used the bark to treat diarrhea (Densmore 1974:292; Tantaquidgeon 1977:32, 120-121, 124-125; Miczak 1999:20,114). Choke cherry was recognized from one feature at Laban Rogers. A closely related species, pin cherry (*Prunus pensylvanica*) was identified from a trash pit at the Richard Whitehart Plantation (Grettler *et al.* 1995).

Clammyweed (*Polanasia graveolens*) is a strong smelling herb common in the south. It was identified from one sample at the Richard Whitehart Plantation (Grettler *et al.* 1995).

Clover (*Trifolium sp.*) is a European forage plant that goes to seed from April through October. The greens and flowers are used for a variety of medical uses (Foster and Duke 1990: 74, 158). Clover seed was reported from a single context at the bottom of a Bloomsbury feature (Heite *et al.* 2001). They are also reported from Wilmington's Block 1184 (LeeDecker 1990: 181).

Coconuts (*Cocos nucifera*) grow anywhere in the tropics that has the correct moisture and temperature. Coconut was reported from a single Wilmington Boulevard context (Klein *et al.* 1984). It was also been reported from a New York City site (Raymer *et al.* 2000:220).

Collomia (*Collomia sp.*) includes a number of small annual native forbs and herbs. *Collomia linearis,* or tiny trumpet, grows in states to the north of Delaware (Natural Resources n.d.). It was identified in one sample from the John Powell Plantation (Grettler *et al.* 1995).

Copperleaf (*Acalypha sp.*) includes a few species of weeds common to farmlands (Natural Resources n.d.). The historic Cherokee used the root of wild mercury (*Acalypha virginica*) to treat pox and other ills (Moerman 1986: 4). Copperleaf seeds were found in five Bloomsbury samples and five of 11 features at the Darrach Store Site (De Cunzo *et al.* 1992). They were also found in two samples at the John Powell Plantation (Grettler *et al.* 1995).

Corn (*Zea*) or maize cob fragments were retrieved from the bottom of Bloomsbury's Feature 18 and from the John Darrach Store Site (De Cunzo *et al.* 1992: 389; Heite *et al.*). It was also found in one sample from the John Powell Plantation (Grettler *et al.* 1995). Maize was the foremost staple vegetable food among the historic Delaware, who treated it with reverence and integrated it into religious ceremonies (Tantaquidgeon 1977). Corn was quickly adopted by European settlers throughout the region as both a human food and animal fodder. Corn is on the Delaware State Seal.

Crabgrass (*Digitaria sp.*) includes numerous varieties of annual weeds that are common in waste places and lawns. Naturalized from Europe, they produce seed from July through October (USDA 1971: 56-59). A few crabgrass seeds came from one context of each of the three wells and another feature at Laban Rogers (Sandy 2004a). A few crabgrass seeds were found in three samples from a feature at Bloomsbury (Heite *et al.* 2001:294). At the Darrach Store Site, crabgrass was retrieved from one feature (De Cunzo *et al.* 1992: 389). Crabgrass seeds were found in the well at the John Powell Plantation, and from the well and sheet midden at Richard Whitehart Plantation (Grettler *et al.* 1995).

Creosote (*Larrea tridenta*), or creosote bush is a shrub native to the American Southwest and California (Natural Resources n.d.). It was identified from a single sample at the John Powell Plantation (Grettler *et al.* 1995).

Dock (*Rumex crispus*), also called curly dock, is a large common perennial weed found in pastures, fields, and gardens. The achne are produced from June through September (USDA 1971: 130). Dock was widely cooked and eaten like spinach (Tantaquidgeon 1977:120-121; Miczak 1999: 114). The root was used in Native American medicine (Tantaquidgeon 1977:33; Densmore 1974:292). Rich in Vitamin A, herbalists use dock to treat a wide variety of medical problems (Heinerman 1996: 482-483). Dye manuals from the eighteenth and nineteenth centuries mention dock as a source of yellow and green dyes (Androsko 1971: 35). Dock was identified from a single feature at Laban Rogers and from five features at the Darrach Store (De Cunzo *et al.* 1992: 388; Sandy 2004a).

Elderberries come from the elder (*Sambucus canadensis*), a common native shrub abundant on floodplains and other moist places (Petrides 1977: 48). The flower and fruit add flavor to a variety of drinks and foods and other parts had various medicinal uses. However, caution is needed, all parts contain hydrocyanic acid. The seeds produce a dye; the seeds and leaves can be used as an insect repellant (Petrides 1977: 48). Four Bloomsbury features yielded elderberry seed, as did two of three Wilmington Block 1184 samples (Heite *et al.* 2001; LeeDecker *et al.* 1990: 174-180).

Elm (*Ulmus americana*), or American elm, is a large tree which produces seed in April and May (Petrides 1972: 226). Once common in the mid-Atlantic region, it is now almost extinct. Native groups made a tea of the inner bark to treat colds and coughs (Tantaquidgeon 1977:31). Bark of European elms have provided tea and flour substitutes (Hedrick 1972: 583). Elm seeds came from seven percent of the Wilmington Boulevard samples (Klein *et al.* 1984).

False pennyroyal (*Hedema pulegioides*) is a widespread herb (Natural Resources n.d.). It was found in two features at the Powell Plantation (Grettler *et al.* 1995).

False Solomon's seal (*Smilacina racemosa*), also called false spikenard, has speckled red berries which were historically used for food and medicine. They can be stored for a long time (Hedrick 1972: 537). The young shoots are used like asparagus and the root can also be used (Peterson 1977: 52). Native herbalists used the root in a combination medicine to treat various ailments (Tantaquidgeon 1977: 34, 38, and 122; Foster and Duke 1990: 32; Miczak 1999: 27). The seed was found in one Richard Whitehart Plantation sample (Grettler *et al.* 1995).

Fiddleneck (*Amasinckia tessellate*) does not currently grow in Delaware (Natural Resources n.d.). It was identified from one Richard Whitehart Plantation Site sample (Grettler *et al.* 1995).

Fig (*Ficus carica*) is native to Europe, Asia, and Africa. Figs were cultivated in Virginia by 1659. Around 1773, legendary botanist William Bartram noted figs growing in the ruins of Frederica, Georgia (Hedrick 1972: 268-269). Figs were common in 18th and 19th century cooking because of their sweetness. Fig seed was identified from 42 percent of the Wilmington Boulevard samples (Klein *et al.* 1984).

Flatsedges include many small perennial herbs of the genus *Cyperus*. Some species of *Cyperus* have roots that can be used for flour (Hedrick 1972). Flatsedge was tentatively identified from a single context in one Laban Rogers feature (Sandy 2004a). Four flatsedge seeds were recovered from the bottom of a Bloomsbury feature. Flatsedge was found in one feature at the Darrach Store Site (De Cunzo *et al.* 1992). At the John Powell Plantation, three specimens came from the well, and one from a trash pit (Grettler *et al.* 1995).

Gayfeather (*Liatris squarrosa*), or scaly blazing star, is a perennial herb native to the eastern United States. Delaware is at the north end of its range. It is endangered in Maryland (Natural Resources n.d.). A close relative, rough blazing star (*Liatris aspera)* provides folk medicine to treat a wide variety of ailments. Gayfeather was reported from two samples at the Richard Whitehart Plantation (Grettler *et al.* 1995).

Geranium (*Geranium sp.*) includes a variety of annual and perennial native herbs (Natural Resources n.d.). The root of Wild Geranium (*G. maculata*) is used by herbalists to treat a variety of medical conditions (Foster and Duke 1990: 146). Geranium was identified from one context at the John Powell Plantation (Grettler *et al.* 1995).

Goosegrass (*Eleusine indica*) is an annual from Asia. It frequents waste places and thrives in hard- packed ground, like paths and house sites (LeeDecker *et al.* 1990: 182). Goosegrass seeds were recovered from 28 percent of the Laban Rogers flotation samples, including samples from all three wells. Goosegrass seeds were identified from eight percent of samples at Bloomsbury. A single specimen of goosegrass was identified from the John Powell Plantation well. It also was found in a sample from the Richard Whitehart Plantation midden (Grettler *et al.* 1995). One charred goosegrass seed was found in Wilmington's Block 1184 (LeeDecker *et al.* 1990).

Grama (*Bouteloua sp.*) is a farmland weed in the Grass Family (Martin and Barkley 1961: 12, 133). It was tentatively identified from three samples at the Bloomsbury Site (Heite *et al.* 2001).

Grapes (*Vitis sp.*) include a variety of well known domesticated and wild species. Grapes can be eaten fresh, dried into raisins, and made into juice or wine. The Mohegan of Connecticut used grape leaves in a simple medicine (Tantaquidgeon 1977: 31, 132-133). A few grape seeds were found in eight samples (19%), including flotation fractions from all three wells and another feature at the Laban Rogers Site (Sandy 2004a). At Bloomsbury, a grape seed was recovered

from the bottom of a well (Heite *et al.* 2001). A grape seed came from a trash pit at the Richard Whitehart Plantation (Grettler *et al.* 1995). At Wilmington Boulevard, grape was found in 37 percent of the contexts, a statewide high (Klein *et al.* 1984).

The **Grass** (*Gramineae*) Family includes countless species of low plants. Grass seed was identified from the Laban Rogers, Bloomsbury, Whitehart and Wilmington Boulevard sites (Klein *et al.* 1984; Grettler *et al.* 1995; Heite *et al.* 2001; Sandy 2004a).

Greenbrier (*Smilax sp.*) includes a variety of native species of thorny vines. Berries are produced from July into the winter. The roots of various species were used to make a meal by many Native Peoples in much of eastern North America (Hedrick 1972: 537-538). The vines and root were used to treat a variety of medical maladies (Foster and Duke 1990: 296). Greenbrier was found in a single sample at the John Powell Plantation (Grettler *et al.* 1995).

Groundcherry (*Physalis sp.*) are perennial herbs that spread both by seeds and rootstocks. They grow along roadsides and in fields and produce seed from June through August (USDA 1971: 320). Groundcherries are distributed throughout the United States and eastern Canada. They can be stored like raisins over the winter. When fully ripened, the ground cherry fruit can be eaten fresh or made into jam (Peterson 1977: 68; Hedrick 1972: 432). Groundcherry was identified from seven percent of the Laban Rogers Site flotation samples (Sandy 2004a). It was found in a trash pit feature at the Richard Whitehart Plantation (Grettler *et al.* 1995).

Hawkweed (*Hieracium aurantiacum*), also called orange hawkweed, is a perennial farmland weed introduced from outside the United States (Martin and Barkley 1961: 52; Natural Resources n.d.). It was tentatively identified from two Bloomsbury features (Heite *et al.* 2001).

Jimson (*Datura stramonium*), also called jimson weed or thornapple, is common in fields, old feed lots, barnyards, and waste places. This coarse foul-smelling plant grows up to five feet high and produces spiny seedpods from July to October. All parts of this plant are poisonous and just gathering the plant can cause swollen eyelids. Jimson is lethal to livestock, and humans. Today, good farmers go to great pains to eradicate it from their property. It is a folk remedy for cancer and the leaves were once smoked as an antispasmodic for asthma (Foster and Duke 1990: 182). Numerous Native American groups throughout the hemisphere used jimson and its cousins for their intoxicating properties (Safford 1917). The Oklahoma Delaware and the Mohegan of Connecticut used the leaves and seeds for a poultice for cuts. The seeds were crushed and mixed with tallow to treat hemorrhoids by the Delaware (Tantaquidgeon 1977: 37, 116-117). The early settlers at Jamestown were familiar with the plant, hence it was known as "Jamestown Weed". Soldiers sent to Jamestown to quell Bacon's Rebellion in 1676 ate the young weeds as a potherb. They were intoxicated and incapacitated for 11 days (Safford 1917: 408). Although it is now considered a weed, it was a popular ornamental as early as the 1600's, known as Moon Flower.

Jimson seed appears consistently and in large numbers in archaeological excavations throughout New England, New York, and Delaware. Throughout the region, it may have been widely consumed as a convenient narcotic during much of the historic period (Mrozowski 1987; LeeDecker *et al.* 1990: 181; Hedrick 1972: 231-232). Thirty-one of the Laban Rogers flotation samples (73 percent) had jimson weed seed, sometimes in large numbers. They included samples from four features (Sandy 2004a). Jimson seeds, sometimes in large numbers, were found in 13 of the Bloomsbury flotation samples (34%). All these samples were from two wells (Heite *et al.* 2001: 294). At Wilmington's Block 1184 excavations, jimson was the second most common seed recovered (LeeDecker *et al.* 1990: 174-180). A single specimen of jimson came from the well at the John Powell Plantation (Grettler *et al.* 1995).

Knotweed (*Polygonum sp*). is a close relative to smartweed and occupies many of the same habitats. Knotweed was tentatively identified from a single sample at both Laban Rogers and Darrach Store (Sandy 2004a; De Cunzo *et al.* 1992).

Lead Plant (*Amorpho canescens*), also called downy amorpha, is a spreading bush that grows up to four feet high (Keeler 1969 :98-100). It was identified from a single context at the John Powell Plantation (Grettler *et al.* 1995).

Lotus (*Nelumbo lutea*), also called American lotus, is a perennial aquatic herb with edible starchy tubers (USDA 1971: 172). The shoots can be eaten like spinach (Peterson 1977: 60). Dried Lotus seed pods are a common decoration today, a practice that may date to the colonial period. It was identified from one feature at the John Powell Plantation (Grettler *et al.* 1995).

Milkweed (*Asclepias sp.*) is a common perennial herb that frequents dry fields, woodlands, and roadsides throughout the east. The seeds fly off on silky hairs from June through August and can travel considerable distances on the wind (USDA 1971: 286-289). The Oklahoma Delaware used milkweed root in a compound medicine to treat epilepsy. An early ethnographer reported the use of milkweed "Frog's milk" by the Nanticoke of Sussex County, Delaware, but by the 1940's it was no longer used. The Delaware and Mohegan ate young milkweed shoots (Tantaquidgeon 1977:39, 60, 116-117, 126-129). So did the French settlers in Canada (Hedrick 1972: 71). Milkweed was tentatively identified from a single feature context at the Laban Rogers Site (Sandy 2004a).

Moleweed (*Euphorbia lathyrus*) is also known as caper spurge and moleplant. The seeds are used as a caper, following processing in salt water and vinegar (Hedrick 1972: 265). It has not been reported from Delaware but is native to surrounding states (Natural Resources Conservation Service n.d.). Moleweed was found in one feature at the Richard Whitehart Plantation (Grettler *et al.* 1995).

Milkpea (*Galactica regularis*) is a small, prostrate perennial, known to grow in the Pine Barrens of New Jersey (Harshberger 1970:233). The Seminole used downy milkpea (G. volbulis) to treat a variety of maladies (Moerman 2006). Milkpea was reported from a single sample at the Richard Whitehart Plantation (Grettler *et al.* 1995).

Nightshade (*Solanum sp.*) includes various woody weeds and vines common in fields, thickets, clearings, and gardens throughout the region. After it flowers from May to October, it produces berries (Peterson 1977: 157). There is some controversy over the edibility of fully ripe berries; unripe berries are poisonous (Hedrick 1972: 544; Peterson 1977: 50). The Delaware of Oklahoma used the root of nightshades to make medicines to treat various ailments (Tantaquidgeon 1977: 122-123). Nightshade seed were identified in low numbers from four samples at Laban Rogers. Seeds identified as bittersweet nightshade (*Solanum dulcimara)* were identified from five samples taken from three features at the Bloomsbury Site (Heite *et al.* 2001:295). At the Richard Whitehart Plantation, nightshade seed was found in the well and sheet midden (Grettler *et al.* 1995).

Nuts of various trees are eaten raw, roasted, boiled, and incorporated into countless Native and Colonial foods (Tantaquidgeon 1977: 59). Nut shell fragments were found in two well features at Bloomsbury (Sandy 1997). Nut shell came from 10 percent of the samples at the John Powell Plantation (Grettler *et al.* 1995). Hickory (*Carya sp.*) was identified at Wilmington Boulevard (Klein *et al.* 1984). When considering preservation variables, it is worth noting that hickories and walnuts are durable, while chestnut and acorn are much less durable, and consequently less likely to be preserved.

Oxalis (*Oxalis stricta*), also known as wood sorrel, is a small plant, of which the leaves and seed pods are used as a salad ingredient and to make a cold drink (Peterson 1977: 72). It was used in the Old World as a potherb, garden ornamental and medicinal herbal remedy (Hedrick 1972). It also was used to treat scurvy (Raymer, Fuss, and Rhodes 2000: 243). Oxalis seeds were found in low numbers from five features at Bloomsbury (Heite *et al.* 2001). Oxalis was found in historic features at the Darrach Store Site. Because of an editing error, it is not clear if it came from two or three features (De Cunzo *et al.* 1992: 389). It was recognized in 25 percent of the samples at the Whitehart site (Grettler *et al.* 1995). In Brooklyn, New York, the seeds of oxalis were the most numerous seeds recovered from 100 Jay Street (Sandy 2004b). At Manhattan's Five Points Site, wood sorrel seeds were retrieved from features related to artisans (Raymer, Fuss, and Rhodes 2000).

Panicum (*Panicum sp.)* includes various annual weeds/grasses common on moist ground and along streams (USDA 1971: 72; Harshberger 1972). It was identified from two samples at the John Powell Plantation (Grettler *et al.* 1995).

Peach (*Prunus sp.*) is a small tree that is native to Asia. Peaches were introduced to America by the Spanish, and were widespread throughout the region by the eighteenth century. The cultivated peach occasionally escaped to form wild thickets (Petrides 1977: 237; Raymer, Fuss and Rhodes 2000: 231). Delaware became a major center for peach production in the 1830s to the 1870s. In addition to a delicious fruit, peach also provided a yellow dye. The leaves and bark were used by home dyers, mainly for wool. The pit or "kernel" was also used (Androsko 1971: 36, 134). The leaves of a bayberry relative, sweet fern, were mixed with peach "seed" to create a child's tonic. The Delaware used an infusion of peach leaves to fight pin worms or stop vomiting (Tantaquidgeon 1977: 118-119).

Peach was found in one feature flotation sample at Laban Rogers. Large enough to be recovered in the site screens, peach pits were recovered from all three wells at Laban Rogers (Sandy 2004a). Peach pit fragments were recovered from Feature 21 at Bloomsbury (Heite *et al.* 2001). Peach was recovered from Feature 85, a postmold associated with an outbuilding of the Darrach Store (De Cunzo *et al.*1992: 98, 389). Peach was found in 30 percent of the features at Wilmington Boulevard (Klein *et al.* 1984a).

Peanut (*Arachis hypogaea*) is native to South America and became an important staple, grown in the American South by the middle of the nineteenth century (Raymer Fuss and Rhodes 2000:220). Peanut was found in one Wilmington Boulevard sample (Klein *et al.* 1984).

Pear (*Pyrus communis*) trees occasionally escape from cultivation and form thickets. (origin?) The fruit is produced from September through November (Peterson 1977: 216). The leaves and bark were used by home dyers during the eighteenth and nineteenth centuries, mainly to treat wool (Androsko 1971: 36). Two samples from one Laban Rogers feature produced pear seeds (Sandy 2004a). It was also identified from Wilmington Boulevard samples (Klein *et al.* 1984).

Peavine (*Lathyrus pusillus*), or tiny pea, is a vine/herb. An American native, the closest place to Delaware that it grows today is Virginia (Natural Resources n.d.). It was identified in one sample at the Richard Whitehart Plantation (Grettler *et al.* 1995).

Pellitory (*Parietaria pensylvanica*), also called Pennsylvania pellitory is an annual herb that has been reported in 47 of the 48 continental United States. Delaware is the lone exception. However, it was identified in a single John Powell Plantation flotation sample (Grettler *et al.* 1995).

Pepper (*Capsicum sp*) has origins that date well back into prehistoric Central America (Hedrick 1972). This valuable fruit and spice is now being recognized for its myriad of medicinal uses. It was recovered from 16 percent of the samples from Wilmington Boulevard (Klein *et al.* 1984).

Peppervine (*Ampelopsis arborea*) is a perennial shrub in the Grape Family. It is native throughout the eastern United States (Natural Resources n.d.). Peppervine seed was recognized in one context from the John Powell Plantation (Grettler *et al.* 1995).

Pepperweed (*Lepidium campestre*), or peppergrass, is an annual herb naturalized from Europe. It is common in fields and meadows, flowering from May through September (USDA 1971: 206-207). Native Americans and colonists used various species of peppergrass for various problems: from a sleep aid, to a topical wash for treating poison ivy, to a veterinary aid to treat chickens (Moerman 1986: 257-258; Foster and Duke 1990: 34). The seeds of pepperweed have a peppery taste and can season dishes. The young leaves are used as a fresh and boiled vegetable (Niering and Olmstead 1988: 430). A few seeds of pepperweed came from the bottom of a Bloomsbury feature (Heite *et al.* 2001).

Pigweed (*Amaranthus sp.*) is one of the amaranths, a very big family of annual weeds and herbs found in fields and waste places throughout the country. Each plant generates thousands of small seeds (USDA 1971: 142-147). Similar to chenopodium, the greens are eaten fresh or boiled, while the seeds are a source of grain, cereal, or flour. The seeds readily pass through the digestive system and have been shown to be viable for more than 40 years (LeeDecker *et al.* 1990:179). The Mohegan of Connecticut ate the greens and used them in a compound medicine to treat hoarseness (Tantaquidgeon 1977: 128-129). Amaranth and Chenopodium seeds are commonly found on Woodland sites in the mid-Atlantic.

At the Laban Rogers Site, 19 percent of the flotation samples, including those from all three wells, contained pigweed (Sandy 2004a). At Bloomsbury, pigweed was recovered from three percent of the samples (Heite *et al.* 2001). Seeds from this genus came from three features at the Darrach Store (De Cunzo *et al.* 1992). Amaranth seed was found in the well at the John Powell Plantation and also in a trash pit at the Richard Whitehart Plantation (Grettler *et al.* 1995). An amaranth seed was found in context 58C in Wilmington's Block 1184 (LeeDecker *et al.* 1990). At Wilmington Boulevard, pigweed came from 42 percent of the samples (Klein *et al.* 1984).

Plums (*Prunus domestica*) are shrubs and small trees that bear fruit from August through October (Petrides 1972). Plums were a native food and the roots were used in combination medicines that treated coughs and other maladies (Tantaquidgeon 1977: 36, 120). Dried into prunes, they can be stored for an extended period. Plums and prunes are used in jellies, pastries, and laxatives. Plum pits came from 12 percent of the Wilmington Boulevard samples (Klein *et al.* 1984).

Poke (*Phytolacca americana*), also known as pokeweed, is a common weed that grows up to eight feet high. The purple berries of poke were made into a dye. Poke root was used in a variety of medicines, while the young shoots were a source of greens (Tantaquidgeon 1977:130-131; Sandy 1985: 141). In historic times, colonists cultivated it for food as well as a dye (Androsko 1971; Wacker and Clemens 1995: 157). Both the root and the berries are considered among the most effective herbal medicines (Heinerman 1996: 375-377). Scientists at Rutgers University are researching this plant for its disease-fighting properties (Heite *et al.* 2001).

Poke seeds were found in both the light and heavy fractions in 29 percent of the Laban Rogers flotation samples. They included many contexts of two features. Pokeweed seeds were found in one feature at Bloomsbury (Heite *et al.* 2001). These seeds were also found in four of 11

features at the Darrach Store Site (De Cunzo et al. 1992). A single poke seed was recovered from the well at the John Powell Plantation and from three of four features at the nearby Richard Whitehart Plantation (Grettler *et al.* 1995). Poke seeds have been found at numerous prehistoric sites in Delaware and throughout the region (Sandy 1985: 141).

Prickly poppy (*Argemone platyceras*) was tentatively identified, based on a seed identification manual photo, in two contexts from one Laban Rogers site feature. Prickly poppy species are found in the Midwest and West (Natural Resources n.d.).

Prickly Mallow (*Sida spinosa*), also called prickly sida, is an annual herb that is widely distributed throughout the East. Frequenting waste places, pastures, and plowed fields, it produces seed from June through October (USDA 1971: 264). Prickly mallow was identified in one John Powell Plantation sample (Grettler *et al.* 1995).

Purslane *(Portulaca sp.)* is a small prostrate plant with succulent leaves and reddish stems that is also a tenacious, prolific little weed well known for monopolizing freshly disturbed ground (Peterson 1977:72). It is cultivated both for food and as an ornamental. The leaves, shoots, and stems can be eaten steamed or raw throughout the growing season. In the Southwest, Indians used the seeds for mush or bread (Sandy 1985). Rich in Vitamin A, Vitamin C, and trace elements, this herb is brewed into a tea to treat a variety of ailments (Heinerman 1996). Historically, purslane was simultaneously a garden favorite and a gardener's nightmare because of its incredible ability to spread. A 1640 botanical journal describes the dilemma: "In the alleyes of the Garden between the beds...or....upon those beds of dung that Gardiners have used to nourse up their Cowcumbers, Melons and Pompoins, wheron after they have been taken away, they have sown Purslane (LeeDecker *et al.* 1990:179).

The tiny seeds of purslane were the second most common seed on the Laban Rogers site, exceeded only by carpetweed. It was present in samples from all features tested (Sandy 2004a). Purslane seeds were recovered from 87 percent of the samples from Bloomsbury, including 18 features and they were the most numerous seeds in the flotation samples (Heite *et al.* 2001). Purslane was found in seven of 11 features at the Darrach Store, which included 64 percent of the samples (De Cunzo *et al.* 1992). Two seeds were discovered at Wilmington's Block 1184 (LeeDecker *et al.* 1990: 174-179). Purslane was also retrieved from a Virginia canal boat (Sandy 2001c).

Ragweed (*Ambrosia sp.*) includes numerous annual herbs that are common in waste places and field. The seeds are produced from July through October (USDA 1971: 364). This plant was used for medicinal purposes by Native groups. A few ragweed seeds were found in 17 percent of the Laban Rogers samples, including samples from all three well features. At Bloomsbury, ragweed was found at the bottom of Feature 18 (Sandy1985; Heite *et al.* 2001b:296). At the John Powell Plantation, one specimen of ragweed came from an outbuilding, while four came from the well. A specimen also came from the Richard Whitehart Plantation sheet midden (Grettler *et al.* 1995).

Rush (*Juncus acumiatus*) is a native plant widely distributed in wetlands over much of North America. It was commonly used by Native groups for basketry and cordage. Shoots of some species were eaten and others were used for medicinal purposes (Moerman 2006). They were also used in making tapers and in thatch for roofs. Rush was identified in one sample at the John Powell Plantation (Grettler *et al.* 1995).

Sage (*Salvia sp.)* is an aromatic perennial shrub native to southern Europe. It is used to treat insect bites, sore throat, intense itching, and other maladies (Heinerman 1996: 410-416). Fresh

or dried leaves were chewed or made into a healthy tea by the Mohegan (Tantaquidgeon 1977:75, 132). It is a folk remedy for cancer and a long list of other medical conditions. It is a common seasoning in European cuisine (Foster and Duke 1990:192). Sage was identified in one sample from the Richard Whitehart Plantation (Grettler *et al.* 1995).

Saltbush (*Atriplex patula)*, also called spear saltbush, is a widely distributed member of the Chenopodiaceae Family (Natural Resources n.d.). A single sample at the Richard Whitehart Plantation had this seed (Grettler *et al.* 1995).

Sea Purslane (*Sesuvium sessile*) is an annual herb that is native to Texas (Natural Resources n.d.). Samfire, or seaside purslane (*S. portulacastrum)* was reportedly pickled in Jamaica, and used as a potherb (Hedrick 1972: 532). Sea Purslane was identified in four features at the John Powell Plantation (Grettler *et al.* 1995).

Sheep Sorrel (*Rumex acetosella*), also called common sorrel, is a common, small plant found in poor soils. It provides a salad ingredient and source of a tart drink (Peterson 1977: 116). It was a folk cure for cancer and numerous other problems (Foster and Duke 1990: 214). It was recovered from a single sample at the John Powell Plantation (Grettler *et al.* 1995).

Skullcap (*Scutellaria sp.*) is a perennial, common, farmlands weed in the Mint Family. The dried herb is used to treat spasms, twitches and convulsions (Heinerman 1996: 410-416). The Oklahoma Delaware used the plant tops to treat stomach maladies (Tantaquidgeon 1977: 37, 122; Miczak 1999). A flavanoid in the plant is a sedative and antispasmodic (Foster and Duke 1990: 214). A single skullcap seed was found near the bottom of Bloomsbury Feature 21 and from one John Powell Plantation feature (Heite *et al.* 2001; Grettler *et al.* 1995).

Soapwort (*Saponia officinalis*), also called bouncing bet is an introduced annual herb that has spread throughout the country (Natural Resources n.d.). Soapworts are used to clean hair; crushed plants are a soap substitute (Peterson 1977: 34; Miczak 1999). Native American and Euroamerican herbalists alike used this plant to treat a wide variety of problems (Foster and Duke 1990: 148). It was reported from one Powell Plantation flotation sample (Grettler *et al.* 1995).

Solomon's Seal (*Polygonatum sp.*) is a short perennial that can supply a cooked green vegetable and potato (Hedrick 1972: 448; Peterson 1977: 76; Foster and Duke 1990: 32). It was identified from a single sample each at the Richard Whitehart Plantation and the John Powell Plantation (Grettler *et al.* 1995).

Sorghum (*Sorgum vulgare*) is an introduced crop, now grown throughout the country (Hedrick 1972: 551; Natural Resources n.d.). It was found in one sample from the Richard Whitehart Plantation (Grettler *et al.* 1995).

Smartweed is classified within the genus *Polygonum* and part of the buckwheat family. It grows readily in cultivated places, ditches, and wetlands throughout the region (USDA 1971; Venning and Saito 1984). Smartweed seeds can be used as a pepper substitute. The flowers and leaves were used for medicinal purposes. The leaves and roots of some species can be eaten in spring (Hedrick 1972: 448-449; Inashima 1990: 229; Heinerman 1996: 430-431). Smartweed roots and leaves were also used by home dyers to produce a yellow dye (Androsko 1971: 35). A variety of smartweed seeds were recovered from 19 samples (45 percent) at the Laban Rogers Site, including the three well features. Some of the samples near the bottom of the wells had the largest number and greatest assortment of types (Sandy 2004a). Polygonum seeds of several species were recovered from a majority of the flotation samples from Bloomsbury (Heite *et al.* 2001). Polygonum seeds, including some identified as knotweed, were recovered from seven of

11 features at the Darrach Store Site (De Cunzo *et al.* 1992). A total of nine smartweed seeds were recovered from the first house and the well at the John Powell Plantation. A single seed came from a Richard Whitehart Plantation trash pit (Grettler *et al.* 1995).

Spikerush *(Eleocharis sp.)* grows in the region and water chestnuts are among the many plants in this genus (Hedrick 1972: 251; Robichaud and Buell 1973:327). Seed was tentatively identified in three samples from one Laban Rogers feature (Sandy 2004a). Two specimens of spikerush were identified from the well at the John Powell Plantation (Grettler *et al.* 1995).

Spurge *(Euphorbia sp.)* is in a widespread genus of small annual and perennial herbs that frequent waste places, gardens, and pastures. The roots and other parts of spurge were used by Native groups to treat many different medical problems (Moerman 1986: 184-185). A single spurge seed was tentatively identified at Bloomsbury (Heite *et al.* 2001). Spurge was found in two samples from the John Powell Plantation (Grettler *et al.* 1995).

Spurry (*Spergula arvensis*) is an annual herb introduced from Europe. It frequents cultivated land and waste places and goes to seed between March and October (USDA 1971). It was identified from a sample at the John Powell Plantation (Grettler *et al.* 1995).

Squash (*Cucurbita sp.*) was grown by Native peoples throughout the region (Hart 1999). In addition to food, squash also supplies watertight containers. Squash seeds were recovered from the bottom of the robbed well at Laban Rogers, both during excavation and through flotation. Three squash seeds were recovered from Block 1184 in Wilmington (LeeDecker *et al.* 1990:174-180). They were also found at Wilmington Boulevard (Klein *et al.* 1984).

Staghorn Sumac (*Rhus sp)* grows as a shrub or small tree. Native people used staghorn sumac berries to make a tea, which also had medicinal uses (Tantaquidgeon 1977). Historically, a wash is used to treat rashes and other skin troubles (Heinerman 1996: 439). The bark and leaves are rich in tannin; the tannin was reportedly used to make ink (Petrides 1972:134). Staghorn sumac was identified in one feature at the Richard Whitehart Plantation (Grettler *et al.* 1995).

St. John's wort (*Hypericum sp.*) or St. Johnswort, is a shrubby perennial found in fields worldwide. Folk medicine experts have used it to treat cancer, as well as problems of the spine and brain (Heinerman 1996: 421-423). St. John's wort was identified from two features at the John Powell Plantation (Grettler *et al.* 1995).

Sumpweed (*Iva frutuscens*) was recovered from one feature at the John Powell Plantation. A related plant, marsh elder (Iva xanthifolia), is an annual herb that that frequents a variety of habitats in States north of Delaware. It goes to seed from August through October (USDA 1971). Domesticated sumpweed (*Iva annua*) has been identified at the Precontact Two Guys Site in Sussex County, Delaware (Leedecker, Kolderhoff and Holt 1996; Sandy 2002).

Sunflower (*Helianthus annus*) is an annual herb introduced to the area from the Midwest. Cultivated varieties produce much larger achenes (seeds) than wild specimens (USDA 1971: 418-419). Sunflowers provide a nut, grain, flour, oil, and a coffee-like drink (Peterson 1977: 88). A sunflower seed hull was recovered in a flotation sample from one Laban Rogers feature. Because of the specimen's condition, it was evaluated as a modern contaminant. It was also found in one sample at the Whitehart Plantation (Grettler *et al.* 1995).

Sweetclover (*Melliotusofficianalis*) is an immigrant from Europe and adjacent parts of Asia. The flowers and seeds are the primary flavoring ingredient in Swiss Gruyere cheese (Hedrick 1972: 359). It was identified in three percent of the Bloomsbury samples (Heite *et al.* 2001).

Sweetgum (*Liquidambar stryaciflua*) are large trees that produce seed from September until at least November (USDA 1972: 203-204). It was found in one sample from the Richard Whitehart Plantation (Grettler *et al.* 1995). The pump stock at Whitten Road is made of the wood of sweetgum (Shaffer et al. 1988:126).

Tansymustard (*Descurainia pinnata*), also called Western Tansymustard, is a widespread native herb (Natural Resources n.d.). It was often grown near the doorway because it repels insects. It was identified in a single context at the John Powell Plantation (Grettler *et al.* 1995).

Tearthumb *(Polygonum sagitatum)* is a member of the large and widespread *Polgonaceae* family of annual and perennial herbs (USDA 1971). Tearthumb was identified in two samples from a feature at the Bloomsbury Site (Heite *et al.* 2001).

Tarweed (*Hemizonia congesta*), also called hayfield tarweed, is an annual herb native to California (Natural Resources n.d.). It was identified in a single context at the John Powell Plantation (Grettler *et al.* 1995).

Verbena and several types of vervain are widespread annual and perennial herbs within the genus *Verbena* (USDA 1971:306-309). Blue vervain (*V. hastata*) frequents damp areas and roadsides throughout the country. The plant flowers from June through October. The tiny seeds can be made into flour and soaking them in several changes of water reduces the bitterness (Peterson 1977:134). Blue vervain root was used in a compound medicine to treat chills by the Oklahoma Delaware (Tantaquidgeon 1977:122-123). The Ojibawa (Chippewa) used it as a nosebleed cure (Densmore 1974:294). Seeds of this genus were recovered in a single sample at Laban Rogers (Sandy 2004a).

Vetch (*Vicia sp.*) includes many species of widespread annual herbs that go to seed from June through October (USDA 1971: 238). *Vicia sylvatica* was recovered through flotation from half the tested contexts at the Richard Whitehart Plantation (Grettler *et al.* 1995).

Viburnum (*Virburnum acerifolium*), also known as mapleleaf viburnum, is a shrub that goes to seed from July through October and is closely related to arrowood (Petrides 1972:95). The fruit of several east coast varieties of this genus are eaten (Hedrick 1972: 592). It was identified from a sample at the Richard Whitehart Plantation (Grettler *et al.* 1995).

Violets (*Viola sp.)* include familiar spring flowers that frequent wet meadows. Violets are used for salad, a cooked green, a soup thickener, tea, and candy (Peterson 1977: 132). Violet seed, in low numbers, was tentatively identified from three flotation samples at Laban Rogers. Five violet seeds were recovered from the well at the John Powell Plantation (Grettler *et al.* 1995).

Wahoo (*Euonymous atropurpureus*) is a wide ranging, tree-like shrub that produces poisonous berries in late fall (Braun 1989: 241). A Chinese species of *Euonymus* has edible leaves (Hedrick 1972: 264). Wahoo was identified in one sample from the Richard Whitehart Plantation (Grettler *et al.* 1995).

Water arum (*Calla palustris*) roots provide an edible flour substitute. They are ground and then heated to remove acrid properties (Hedrick 1972: 125). Water arum was found in one sample from the John Powell Plantation (Grettler *et al.* 1995).

Watermelon (*Citrullus vulgaris*) has its origin in tropical Africa. Already well known in Europe by the 1500s, watermelons were grown by Native People and colonists throughout the eastern United States by 1665 (Hedrick 1972: 169-172). At the Laban Rogers Site, a single context of Feature 269 yielded watermelon seed (Sandy 2004a). At Wilmington Boulevard, one third of the samples contained watermelon (Klein *et al.* 1984).

Water primrose (*Jussica leptocarpa*) was identified from 10 percent of the samples from the John Powell Plantation (Grettler *et al.* 1995).

Water smartweed (*Polygonum amphibium*) is a large perennial smartweed that frequents wetlands, like those that surround the Bloomsbury site. Delaware is near the southern limit of the range of this European import. Water smartweed was found in one flotation sample at the Bloomsbury site (Heite 2001).

Wild lettuce is a very common herb within the genus *Lactuca.* Introduced from Europe, it grows in disturbed places, fields, and orchards (USDA 1971: 426). Young plants provide fresh greens, while older plants are used for a cooked vegetable (Peterson 1977: 86). The juice of the plant is said to be slightly narcotic. A medicine made from wild lettuce was used to treat warts (Densmore 1974: 290; 301). Wild lettuce was also a source of dye to home dyers (Androsko 1971: 139). A single Laban Rogers feature flotation sample produced wild-lettuce seed (Sandy 2004a). A wild lettuce seed was recovered from the sheet midden at the Whitehart Plantation (Grettler *et al.* 1995: 58).

Winterberry (*Ilex verticillata*) is a shrub in the Holly Family that produces bright red berries. In Delaware, it currently grows only in New Castle County (Natural Resources n.d.). The leaves are used as a tea substitute (Hedrick 1972:312). It was recovered in Kent County from one John Powell Plantation sample (Grettler *et al.* 1995).

Wintercress (*Barbarea vulgaris*), or garden yellowrocket is a biennial herb that has become widespread since it was introduced to North America (Natural Resources n.d.). It supplies a salad, cooked green and cooked vegetable (Peterson 1977: 64). Wintercress was identified in one sample from the John Powell Plantation (Grettler *et al.* 1995).

Witch hazel (*Hammamelis virginica*) is a deciduous shrub that puts out seed in the late fall. The plant provided a virtual medicine cabinet to Native groups. Twigs and leaves were made into a soothing lotion for insect bites, cuts, and bruises. Twigs were made into brushes and the wood was favored by dowsers. The Menominee used the seeds as a sacred bead in a medicine ceremony and dried seeds were used to predict if a patient would recover (Tantaquidgeon 1977; Moerman 1986: 212-213). Witch hazel was proclaimed edible by nineteenth century reports, although this has been disputed (Hedrick 1972: 297). Witch hazel seed came from one sample at the Richard Whitehart Plantation (Grettler *et al.* 1995). It was also found in one New York State prehistoric site (Greenhouse 2000).

Sclerotia are fungi bodies that are commonly found in huge quantities on prehistoric archaeological sites (e.g. Mc Weeney 1989; Crowley and Sandy 1992; Sandy 2002). These black, ball-shaped objects vary in size from less than one millimeter to more than four millimeters, and are part of the resting stage of mycorrhizal fungi. Called *Cenocuccum graniforme* and, *Cenocuccum geophilum*, these fungi live in a symbiotic relationship with a large variety of both deciduous and evergreen trees. The *Cenocuccum graniforme* and, *Cenocuccum geophilum* form hard, potato-like growths which can be dug up, roasted under fires, then ground and mixed with sorrel and meal, and baked into bread (Heinerman 1996:241-243; Sandy 2002). Fungal sclerotia were said to be used in times of food shortage (Rose 2000). However, it may be that sclerotia are just background "seed rain" on sites, unless they can be shown to be concentrated in cultural features.

Sclerotia were present, usually with more than 100 specimens, in all 42 samples at the Laban Rogers Site (Sandy 2004). Similarly, sclerotia were found in all 38 samples at Kent County's Bloomsbury site (Heite 2001). Sclerotia are presumably the "fungi spores" identified from 10 of

11 features at the Darrach Store Site (De Cunzo *et al.* 1992: 386-393). At the John Powell Plantation, hundreds of "unidentified spores" were found in eight of nine samples from the well (Grettler *et al.* 1995: 117). Sclerotia were found in both samples from the Atsion Mansion in New Jersey, and also in a Virginia canal boat sample (Sandy 2001b, 2001c).

CONCLUSIONS

The list of Delaware historic archaeological sites that have incorporated flotation is growing. Flotation deserves to be an integral part of historic site excavations because flotation analysis gives an expanded, more accurate sample of the artifacts and ecofacts present on a site. It provides a wealth of valuable information about historic foodways and medicine and can help provide a more detailed understanding of the historic environment of The First State and every state. Although the focus of this paper is the floral and fungal remains from Delaware historic sites, it should not be overlooked that large-scale flotation recovers important small artifacts including beads and pins, and faunal remains. Small Wonders!

This survey of plant remains from Delaware historic sites resulted in an extensive inventory of more than one hundred plants spanning the historic period in Delaware. The crops identified from the flotation samples include beans, squash and watermelon. Fruit from trees and vines include cherry, peach, pear, and grape. Raspberries and blackberries are the most important berries and are commonly recovered from historic sites. Seeds from a large number of weedy plants were recovered from the different sites. Most of these "weeds" have documented medical and/or food uses and many have been found on other historic archaeological sites. Most prominent in this group are purslane, carpetweed, chenopodium, goosegrass, and pigweed. Research throughout the Middle Atlantic has shown that the first three examples are almost always present in huge numbers at prehistoric and historic sites alike. This could be the result of the propensity of such plants to cover gardens and fields, as well as their prodigious production of seeds. Other plants that were probably also exploited for food or medicine include poke, wild-lettuce, ground cherry, nightshade, and a variety of smartweeds (*Polygonum*).

Flotation at Delaware historic sites has shown the importance of two plants, bay berry and jimson weed. Bayberry has many uses, including food, medicine and a source of wax. Jimson was widespread in urban areas throughout the east, including Wilmington since the Eighteenth Century. Seeds from Bloomsbury, the John Powell Plantation, and Laban Rogers show this fast growing, opportunistic, poisonous weed was also common in rural Delaware (LeeDecker *et al.* 1990; Sandy 2001b; Grettler *et al.* 1995; Raymer, Fuss and Rhodes 2000). It was used as a medicine, and perhaps abused as a recreational drug throughout much of the historic period (Safford 1917; Mrozowski 1987).

Many Delaware historic contexts tested with flotation produced sclerotia, which are the fruiting bodies of fungi symbiotically linked to various types of trees. Often present by the thousands, the nature of their introduction into archaeological matrices is not clear, nor is there any clear link to historic use. However it is possible that they are related to historic use as survival food and/or medicine (Sandy 2002; Heinerman 1996; Rose 2000).

It is worth noting that the waterlogged contexts from the bottoms of the wells at Delaware historic sites had exceptional seeds, both in total numbers of seeds and in the variety of species represented. Historical archaeologists should clearly make an effort to get to the very bottom of future well excavations and to take very large flotation samples.

The numerous and diverse seeds from Delaware historic sites have yielded micro-environmental, seed-based information available nowhere else. These seeds cover a time beginning over 300 years ago and along with those from historic sites that will be excavated in the future, have a tremendous potential to detail the historic environment of Delaware and the region. Problems remain in assessing this new type of environmental information, which include evaluating the effect of bioturbation and other sources of disturbance, and a lack of comparable data from other sites. Obtaining the maximum amount of information from these buried time capsules of environmental information remains a challenge to environmental archaeologists.

A data base for plants identified at Delaware prehistoric and historic sites is needed to make best use of the available and future flotation data. This data base would likely be modeled after prehistoric archaeological plant data bases, like that established by North Carolina (Scarry and Scarry 1997). Eventually, when all the states have similar data bases, the history of the vegetation and ethnobotany of our nation will be much easier to research.

The United States Department of Agriculture's Natural Resources Conservation Service has established an online resource of great utility to the archaeobotanist. *The Plants Database,* available at http://plants.usda.gov., not only provides plant classification and range, but also quality photographs of seeds (Natural Resources n.d.). Perhaps the USDA or another group could add archaeological data to plant distribution maps. That might prove a valuable tool for tracking plant extinction and long-term climate change. One obstacle to this idea is that seed identifications often identify to the Genera level, and not to the Species level. Future advancements in equipment and related techniques might make specific identifications of archaeological seeds more common and accurate.

One area of considerable interest to natural scientists concerns how long seeds remain viable at archaeological sites. Studies conducted at Michigan State University have documented seed viability for more than 100 year period, but have not studied the preservation of non-viable seeds. Seed preservation is a complex issue involving many factors like soil acidity and moisture. Also, seed viability and preservation clearly varies tremendously by Family. Among the seeds that clearly last for extended periods are those of the *Solanaceae*, or Nightshade Family which includes the genus *Physalis* (ground cherries), the genus *Solanaceae* (tomatoes and nightshade). Chinese archaeologists claimed to have grown tomatoes from a 2,000 year old seed (Sandy 2002). Archaeologists at the Shawnee-Minnisink Site on the Upper Delaware River claim to have found preserved groundcherry seeds that are at least Archaic in age (Moeller 1982:8-9). Both groundcherry and nightshade seeds were recovered from Delaware historic sites.

There is a growing body of evidence that seeds from archaeological sites can remain viable for hundreds, or even thousands of years. An international team led by UCLA scientists have germinated lotus seeds from China that are nearly 500 years old (Science Blog 2002). In Israel, scientists have succeeded in germinating a date palm seed that was nearly 2,000 years old. The "Methuselah" date palm, recovered from Masada, has tremendous symbolic import. It may have commercial potential value as well; local dates were famous in the Roman world for their food and medicinal uses (Erlanger 2005). Of course preservation variables are critical and conditions in Delaware are not the same as Israel. In coming decades, the value of seeds recovered from Delaware archaeological sites is likely to increase as the sciences related to plant genetics improve to the point that ancient seeds can be germinated, and/or their DNA harvested and used.

The flotation data from the Delaware historic sites joins a growing body of evidence that flotation and the study of botanical remains will be of considerably greater importance in future

archaeological investigations. Flotation studies, followed by germination experiments, have the potential to yield vital seeds and plants that are true "heirlooms." Scientists are developing techniques for encouraging ancient seeds to germinate. Recent advances in the isolation of DNA indicate the possibility of extracting DNA from "dead" seeds. It might even be possible to introduce this genetic material into a living seed and produce vital plants with the DNA of the "dead" plant, the "donor and host" method. The hundreds of thousands of seeds recovered through flotation from Delaware's historic sites represent a potentially valuable "seed bank." This history of Delaware plants, written in DNA, extends back thousands of years. New techniques and methods are now being developed to read that important history.

We know how to retrieve the seeds from Delaware historic sites that we will dig in coming years. The seeds from Laban Rogers, Bloomsbury, the John Darrach Store, the John Powell and Richard Whitehart Plantations, Wilmington Boulevard, and hopefully many other Delaware historic sites, will form an important scientific resource in the years to come.

Acknowledgements

Special thanks go to Carl M. Freeman Communities, LLC and to DelDOT for sponsoring the investigations discussed in this report. Patricia Condell edited and improved on an earlier version of this paper, and has been a career-long friend since our days on Wilmington Boulevard. Thanks go to Kevin Cunningham of DelDOT for encouraging this project and for his efforts in behalf of First State archaeology. Keith Doms helped with editing, and supplied interesting ideas and information.

REFFERENCES

Androsko, Rita J.
1971 *Natural Dyes and Home Dyeing.* Dover Publications. New York.

Bachman, David C. and Wade P. Catts
1990 *Final Archaeological Investigations of the Lafferty Cemetery 7K*-D-11, *State Route 1 Relief Corridor, Dover, Kent County, Delaware.* Delaware Department of Transportation Archaeology Series No. 80. Dover, DE.

Beidleman, Katherine, Wade P. Catts and Jay F. Custer
1986 *Final Archaeological Investigations of Block 1191, Wilmington, New Castle County, Delaware.* Delaware Department of Transportation Archaeology Series No. 39. Dover, DE.

Braun, E. Lucy
1989 *The Woody Plants of Ohio.* Ohio State University Press. Columbus, OH.

Bruchac, Joseph
1997 *The Native American Sweat Lodge: History and Legends.* The Crossing Press. Freedom, CA.

Catts, Wade P., Jay Hodny, and Jay F. Custer
1989 *"The Place at Christeen": Final Archaeological Investigations of the Patterson Lane Site Complex, Christiana, New Castle County, Delaware.* Delaware Department of Transportation Archaeology Series No. 74. Dover, DE.

Catts, Wade P. and Jay Custer
1990 *Tenant Farmers, Stone Masons, and Black Laborers: Final Archaeological Investigation of the Thomas Williams Site, Glasgow, New Castle County, Delaware.* Delaware Department of Transportation Archaeology Series No. 82. Dover, DE.

Clark, David T.
1984 "Appendix G – Floral Data." In *Final Archeological Investigations at the Wilmington Boulevard, Monroe Street to King Street, Wilmington, New Castle County, Delaware* by Terry H. Klein *et al.* Delaware Department of Transportation Archaeology Series No. 29. Dover, DE.

Coleman, Ellis C., Wade P. Catts, Angela Hoseth, and Jay F. Custer
1990 *Final Archaeological Investigations of the John Ruth Inn Site, 7-NC-D-26, Red Mill Road and Routes 4 and 273, New Castle County, Delaware.* Delaware Department of Transportation Archaeology Series No. 77. Dover, DE.

Crowley, Paula and William Sandy
1992 *Stage II Cultural Resource Investigations of the Rafters Site (Locus 2) on the Water's Edge Property, City of Saratoga Springs, Saratoga County, New York.* Draft report in the files of the authors.

Custer, Jay F. and Kevin W. Cunningham
1986 Current Research in the Historic Archaeology of Northern Delaware. *Bulletin of the Archaeological Society of Delaware* Number 21 New Series.

De Cunzo, Lu Ann, Angela Hoseth, Jay Hodny, JoAnn E. Jamison, Wade P. Catts, and David C. Bachman
1992 *Final Archaeological Investigations at the John Darrach Store Site, Delaware Route 6-Woodland Beach Road, Smyrna Section, Delaware Route 1 Corridor, Kent County, Delaware.* Delaware Department of Transportation Archaeology Series No. 93. Dover, DE.

Delorit, R.J.
1970 *Illustrated Taxonomy Manual of Weed Seeds.* Agronomy Publications. River Falls, WI.

Densmore, Frances
1974 *How Indians Use Wild Plants for Food, Medicine & Crafts.* Dover Publications. New York.

Erichsen-Brown, Charlotte
1979 *Medicinal and Other Uses of North American Plants.* Dover Publications. New York.

Erlanger, S.
2005 After 2,000 Years, a Seed from Ancient Judea Sprouts. *New York Times*. June 12; sect. 1:3.

Foster, Steven and James A. Duke
1990 *Eastern/Central Medicinal Plants.* Houghton Miflin Company. Boston.

Greenhouse Consultants Inc.
2000 *Archaeological Data Recovery Excavations of Twin Lakes Farms, Town of Bedford, Westchester County, New York.* Greenhouse Consultants, Inc. New York.

Grettler, David J., George L. Miller, Keith Doms, Brian Seidel, Macon Coleman, and Jay F. Custer
1995 *Landowner and Tenant Opportunity in Seventeenth Century Central Delaware: Final Archaeological Investigations at the Richard Whitehart (7K-C-203C) and John Powell (7K-C-203H) Plantations, State Route 1 Corridor, Kent County, Delaware.* Delaware Department of Transportation Archaeology Series No. 127. Dover, DE.

Harshberger, John W.
1972 *The Vegetation of the New Jersey Pine-Barrens.* Dover Publications, New York. Originally published 1916.

Hart, John P. (editor)
1999 *Current Northeast Paleoethnobotany.* New York State Museum Bulletin, No. 494. New York State Museum. New York.

Hedrick, U. P.
1972 *Sturtevant's Edible Plants of the World.* Dover Publications, New York.

Heinerman, John
1996 *Heinerman's Encyclopedia of Healing Herbs & Spices.* Prentice Hall, Paramus, NJ.

Heite, Edward, Cara Blume, William Sandy, Edward Otter, and H.J. Heikenen
2001 *Mitsawokett to Bloomsbury Archaeology and history of an unrecognized indigenous community in central Delaware.* Delaware Department of Transportation Archaeological Series No. 154. DRAFT. Now available at *mitsawokett.com/Bloomsbury*.

Hoseth, Angela, Colleen De Santis Leithren, Wade P. Catts, Ellis C. Coleman, and Jay F. Custer
1990 *Final Archaeological Investigations of the A. Temple Site (7NC-D-68), Chestnut Hill Road (Route 4), Ogletown, New Castle County, Delaware.* Delaware Department of Transportation Archaeology Series No. 81. Dover, DE.

Hoseth, Angela, Wade P. Catts, and Rebecca Tinsman
1994 *Status, Landscape and Tenancy at Mount Vernon Place: Final Archaeological Investigations of the Jacob B. Cazier Tenancy Site #2, State Route 896, New Castle County, Delaware.* Delaware Department of Transportation, Archaeology Series No. 104. Dover, DE.

Hutchens, Alma R.
1991 *Indian Herbology of North America.* Shambala. Boston.

Inashima, Paul Y.
1990 Prehistoric Subsistence, Settlement, and Seasonality in the Northern Blue Ridge. *Quarterly Bulletin of the Archeological Society of Virginia* 45(4): 227-234.

Kavasch, E.B.
1981 *Guide to Northeastern Wild Edibles.* Hancock House. Blaine, WA.

Keeler, Harriet
1969 *Our Northern Shrubs and how to identify them.* Dover Books. New York.

Klein, Terry H., Patrick H. Garrow, David T. Clark, Amy Friedlander, Thomas B. Ford, Louise B, Heite, Cheryl A. Holt, and Cara L. Wise
1984 *Final Archeological Investigations at the Wilmington Boulevard, Monroe Street to King Street, Wilmington, New Castle County, Delaware.* Delaware Department of Transportation, Archaeology Series No. 29. Dover, DE.

LeeDecker, Charles H., Cheryl A. Holt, Amy Friedlander, Meta Janowitz, Marie-Lorraine Pipes, Mallory A. Gordon, Sharla C. Azizi, and Marian E. Craig
1990 *Archaeological and Historical Investigation of Block 1184, Wilmington, New Castle County, Delaware.* Delaware Department of Transportation, Archaeology Series No. 78. Dover, DE.

LeeDecker, Charles H., Jonathan Bloom, Ingrid Wuebber, and Marie-Lorraine Pipes, with Karen R. Rosenberg
1995 Final Archaeological Excavations at a Late 18th-Century Family Cemetery for the U.S. Route 113 Dualization, Milford to Georgetown, Sussex County, Delaware. Delaware Department of Transportation, Archaeology Series No. 134. Dover, DE.

LeeDecker, Charles H. Brad Kolderhoff and Cheryl Holt
1996 *Excavations of the Two Guys Site (7S-F-68), Sussex County, Delaware.* Report prepared by The Cultural Resource Group, Louis Berger & Associates. East Orange, NJ.

Martin, Alexander C. and William D. Barkley
1961 *Seed Identification Manual.* University of California Press. Berkeley, CA.

McWeeney, Lucinda
1989 What Lies Lurking Below the Soil: Beyond the Archaeobotanical View of Flotation Samples. *North American Archaeologist* 10:227-230.

Miczak, Marie
1999 *Nature's Weeds, Native Medicine.* Lotus Press, Twin Lakes, WI.

Moeller, Roger W.
1982 *Practicing Environmental Archeology.* American Indian Archaeological Institute, Washington, CT.

Moerman, Daniel E.
1986 *Medicinal Plants of Native America*. Volumes 1 and 2. Museum of Anthropology, Technical Reports, Number 19, The University of Michigan. Ann Arbor, MI.

n.d. *Native American Ethnobotany.* Dearborn: University of Michigan. http://herb.umd.umich.edu/. Accessed September 15, 2006.

Mrozowski, Stephen
1987 Exploring New England's Evolving Urban Landscape. In *Living In Cities: Current Research in Urban Archaeology,* edited by Edward Staski. Society for Historical Archaeology, Special Publication Series, Number 5:1-10.

Niering, William A. and Nancy Olmstead
1988 *The Audubon Society Field Guide to North American Wildflowers- Eastern Region.* Alfred A. Knopf. New York.

Pearsall, Deborah M.
1989 *Paleoethnobotany: A Handbook of Procedures*. Academic Press. New York.

Peterson, Lee Allen
1977 *A Field Guide to Edible Wild Plants.* Houghton Miflin Company, Boston.

Petrides, George A.
1972 *A Field Guide to Trees and Shrubs*. Houghton Miflin Company. Boston.

Raymer, Leslie E. with Richard Fuss and Cynthia Rhodes
2000 Macroplant Remains from the Five Points Neighborhood, New York City: A Study of Nineteenth-Century Urban Subsistence Patterns. *Tales of Five Points: Working Class Life in Nineteenth Century New York-Volume II- An Interpretive Approach to Understanding Working Class Life.* Rebecca Yamin, editor. Report prepared by John Milner Associates, Inc. West Chester, PA.

Roach, John
2005 2,000-Year-Old Seed Sprouts, Sapling is Thriving. *National Geographic News*. Nov. 22. Available at http://news.nationalgeographic.com/news/2005/11/1122_051122_old_seed.html.

Robichaud, Beryl and Murray F. Buell
1973 *Vegetation of New Jersey.* Rutgers University Press. New Brunswick, NJ.

Rose, David
2000 Tuckahoe and Fungus Stone. Spring. Available at http://www./coma/nfuspr00.html.mushroomthejournal.com. Originally in "Notes from Underground." *Spores Illustrated.*

Safford, W.E.
1917 Narcotic Plants and Stimulants of the Ancient Americans. *Annual Report of the Board of Regents of The Smithsonian Institution, 1916.* pp. 387-424. Smithsonian Institution. Washington, D.C.

Sandy, William
1985 Flotation Studies and Their Value for New Jersey Archaeology. Unpublished M.A. Thesis, Rutgers University. New Brunswick, NJ.

1989 Appendix C - Flotation Analysis. In *Intensive Test Excavations at the Old Barracks, City of Trenton, Mercer County, New Jersey.* Report prepared by Hunter Research Associates. Trenton, NJ.

1991 *Phase II Cultural Resource Investigations of a portion of the River Bend Development Property, Town of Schaghticoke, Rensselaer County, New York.* Report prepared by Greenhouse Consultants. New York.

1992 *Water's Edge (Vista) Locus 1 Site, Saratoga, New York - Flotation Analysis.* Report in the author's files.

1997 Bloomsbury: Seeds, Beads and Scales, Report on Flotation. Paper presented to the Middle Atlantic Archaeological Conference. Ocean City, MD.

2001a *Report on Flotation and Archeobotanical Analysis of The Crawford Carroll Boulevard Site.* Report Submitted to Heite Consulting, Camden, DE.

2001b *Flotation Report - Atsion Mansion, Atsion State Recreation Area, Burlington County, New Jersey.* Report submitted to Historic Conservation & Interpretation, Inc., Newton, NJ.

2001c *The Marymont Canal Barge, Virginia: Report on Flotation Analysis.* Report submitted to Browning & Associates, Midlothian, Virginia.

2002 After the Delaware Park Site: Twenty-five Years of Flotation. *Bulletin of the Archaeological Society of Delaware* 39:4-16.

2004a *Laban Rogers Site 7S-K-118, Williamsville, Sussex County, Delaware: Report on Flotation and Plant Remains.* Report submitted to Heite Consulting, Inc., Camden, DE.

2004b Flotation Report: 100 Jay Street, Block 53, Lot 27, Brooklyn, New York. Report submitted to Greenhouse Consultants. New York.

Scarry, John F. and C. Margaret Scarry
1997 *Subsistence Remains from Prehistoric North Carolina Archaeological Sites: Archaeobotanical Remains from North Carolina Archaeological Sites.* Research Laboratories of Archaeology, University of North Carolina, Chapel Hill. Available at http://www.arch.dcr.state.nc.us/subsist/subsis.htm

Schonbeck, Joan
2003 Bayberry. *Gale Encyclopedia of Alternative Medicine.* Available at http://www.findarticles.com/p/articles/mi_92603/is_0000/ai_2603000015.

Science Blog
2002 Centuries-old lotus seeds germinated by UCLA scientists. February. Available at http://www.scienceblog.com/community/older/2002/c/20025556.html.

Shaffer, Mark, Jay F. Custer, David Grettler, Scott C. Watson, and Colleen De Santis
1988 *Final Phase III Investigations of the Whitten Road Site 7NC-D-100, Whitten or Walther Road, County Road 346, New Castle County, Delaware.* Delaware Department of Transportation Archaeology Series No. 68. Dover, DE.

Speck, Frank G.
1941 A List of Plant Curatives Obtained from the Houma Indians of Louisiana. *Primitive Man* 14:49-75.

Struever, Stuart
1968 Flotation Techniques for the Recovery of Small Scale Archaeological Remains. *American Antiquity* 33:353-362.

Strutevant, William
1954 *The Mikasuki Seminole: Medical Beliefs and Practices.* Yale University. Ph.D. dissertation. New Haven, CT.

Tantaquidgeon, Gladys
1977 *Folk Medicine of the Delaware and Related Algonkian Indians.* Pennsylvania Historical and Museum Commission Anthropological Series No. 3. Harrisburg, PA.

Thomas, Ronald A.
1981 *Archaeological Investigations of the Delaware Park Site 7 NC-E 41.* Report prepared by Mid-Atlantic Archaeological Research Inc., Newark, DE.

United States Department of Agriculture
1971 *Common Weeds of the United States.* Dover Publications, Inc. New York.

Venning, Frank and Manabu Saito
1984 *A Guide to Field Identification Wildflowers of North America.* Golden Press. New York.

Wacker, Peter O. and Paul G.E. Clemens
1995 *Land Use in Early New Jersey.* New Jersey Historical Society. Newark, NJ.

Williams, David
1973 Flotation at Siraf. *Antiquity.* 67(188):288-292.

Weiner, M.A.
1980 *Earth Medicine – Earth Foods.* MacMillan. New York.