Report on the Analysis of Two Flotation Samples Collected from the Carty-Miller House, Catoctin Furnace, Frederick County, Maryland

Prepared for: Catoctin Furnace Historical Society

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Recent excavations at the Carty-Miller House located within the Catoctin Furnace community produced soil samples for flotation and macrobotanical recovery. Two flotation samples each measuring 5.25 liters in original soil volume were collected from unscreened soils excavated within Test Unit 4 (Strata IIA and IIB). Soil samples were subjected to flotation processing and macrobotanical analysis. Results document plant macroremains and other minute artifacts that offer information about domestic activities at this 19th century furnace workers home.

Soil samples were individually water-flotation processed using a Flote-Tech flotation system equipped with 1.0 millimeter coarse fraction and 0.325 mm fine fraction screens. The Flote-Tech system is a multi-modal flotation system designed to separate organic remains from soil matrices. Processing resulted in light (flotable) and heavy (sinkable) fractions. Floted portions were air dried. Analysis of flotation samples followed standard procedures for the analysis of macrobotanical remains (Pearsall 2000; Fritz and Nesbitt 2014). Recovered light and heavy fractions of material were individually passed through a series of geological sieves to produce fractions of different sizes to facilitate materials sorting. The greater-than or equal-to 2 mm botanical specimens were examined under low magnification (10X to 40X) and sorted into general categories of botanical material (i.e. wood, seed, etc.). The less-than 2mm size fractions were examined under low magnification for the remains of seeds and cultivated plants.

Taxonomic identifications were attempted on all nut and seed remains, and on a random subsample of 20 wood fragments from each sample in accordance with standard practice. Identifications of all classes of botanical remains were made to the genus level when possible and to the species level only when the assignment could be made with certainty. All identifications were made under low magnification (10X to 40X) with the aid of standard texts (Edlin 1969; Panshin and deZeeuw 1980; Martin and Barkley 1961; Schopmeyer 1974; Montgomery 1977) and checked against plant specimens from a modern reference collection representative of the flora of Frederick County, Maryland (Brown and Brown 1987; Brown and Brown 1972; USDA 2025).

Sample matricies were composed of gravel and historic debris (dominated by brick, coal, and glass slag) and included a variety of natural ecofacts and cultural artifacts (detailed in Table 02).

Table 02: Non-plant artifacts and ecofacts observed within the flotation samples

Sample no.	Test unit	Stratum	Flotation matrix description
51	4	IIA	gravel, coal and coal products, degraded ferrous metal, brick, mortar, bone fragments, marine shell fragments, hen's eggshell fragments, lead item, glass slag, fish scale, insect remains, snails, sclerotia, lead ball, pin fragment, glass, plastic, clothing fastener
52	4	IIB	gravel, coal and coal products, degraded ferrous metal, brick, mortar, bone fragments, plaster, hen's eggshell fragments, lead item, glass slag, leather, newsprint, insect remains, snails, sclerotia, ceramic, brass pin, brass nail fragment, iron nails, leather (sample)

red = items isolated for further analysis

The flotation assemblage recovered from the Carty-Miller house produced plant macroremains with historic application as food, fuel, and construction material. Flotation of 10.5 liters of cultural fill produced 32.3 grams of carbonized plant material for study (an average of 3.076 grams per liter). Three thousand forty-six carbonized plant artifacts comprise the macrobotanical dataset. Results are presented in Table 03.

Sample #51

Sample #51 was collected from Stratum IIA of Test Unit 4. 5.25 liters of soil were subjected to water flotation and produced 12.58 grams of carbonized plant material for study. Other artifacts recovered through flotation include coal and coal products, bone fragments, ferrous metal, brick, mortar, bone fragments, marine shell, hen's eggshell, lead item, glass slag, fish scale, insect remains, snails, sclerotia, a lead ball, straight pin fragment, glass, plastic, and a clothing fastener. Carbonized plant macroremains from this sample included 1,354 fragments of wood charcoal weighing 12.58 grams. Identified wood taxa include American chestnut (*Castanea dentata*) (11 fragments or 55 percent of the wood sample selected for identification from this sample), sycamore (*Platanus occidentalis*) (four fragments or 20 percent), and a ring porous type (five fragments or 25 percent). Uncarbonized leaf litter, roots, and seeds of jimsonweed (*Datura stramonium*), raspberry or blackberry (*Rubus*), and elder (*Sambucus nigra*) were also present within Sample #51. These unburned remains may be culturally derived, or they may represent material cached by rodents beneath the Carty-Miller House.

Table 03: Inventory of flotation recovered plant macroremains

Sample Number	51	52	Total
Test Unit	4	4	2 samples
Stratum	IIA	IIB	
Volume original soil sample (gallon)	5.25	5.25	10.5
Weight carbonized plant remains (grams)	12.58	19.72	32.3
WOOD CHARCOAL (number of fragments)	1354	1685	3039
total weight (grams)	12.58	19.56	32.14
Castanea denata (American chestnut)	11		11
Pinus sp. (pine, yellow/hard group)		20	20
Platanus occidentalus (sycamore)	4		4
ring porous	5		5
fragments randomly selected for identification	20	20	40
NUTSHELL (number of fragments)	0	1	1
total weight (grams)	0	0.03	0.03
Juglans nigra (black walnut)		1	1
SEED (number of fragments)	0	6	6
total weight (grams)	0	0.13	0.13
Vitis sp. (grape) pip		5	5
Vitis sp. (grape) pip fragment		1	1
UNCARBONIZED PLANT MATERIAL (presence)	x	x	
Datura stramonium (jimsonweed) seed	x	x	
Rubus sp. (raspberry/blackberry) seed	x	x	
Sambucus nigra (elder) seed	x	x	
deciduous leaf litter	x		

Sample #52

Sample #52 derives from Stratum IIB of Test Unit 4. Flotation of 5.25 liters of soil from this stratum produced 19.72 grams of carbonized plant artifacts for analysis. The sample matrix contained coal and coal products, ferrous metal, brick, mortar, bone, plaster, hen's eggshells, a lead item, glass slag, leather, newsprint, insect remains, snails, sclerotia, ceramics, a brass pin, a brass nail fragment, and iron nails. Plant food remains from the Carty-Miller house were confined to this Stratum IIB level, where one fragment (0.03 grams) of black walnut (*Juglans nigra*) shell and grape (*Vitis*) pips (five entire and one fragment weighing 0.13 grams) were recovered in addition to wood charcoal. Wood charcoal from Sample #52 totaled 1,685 fragments (19.56 grams). 100 percent of the wood sample selected for identification from Sample #52 was confirmed as pine (*Pinus*). Uncarbonized plant materials from Stratum IIB include roots and seed of jimsonweed

(*Datura stramonium*), raspberry or blackberry (*Rubus*), and elder (*Sambucus nigra*) seeds.

Plate 01: Grape (*Vitis*) pips recovered from Sample #52

The Carty-Miller House flotation samples documented an interesting array of plant macroremains relating to the 19th century domestic occupation of the structure. Eonomically important plants useful for food, fuel, and building construction were present within the samples, with wood charcoal being abundant. Comestible plant materials were limited to the deeper stratum (Sample #52), where grape and black walnut were identified.

Comparative archeobotanical assemblages are provided by other workers homes within the Catoctin Furnace community. Analysis of two flotation samples from subfloor contexts at the Forgeman's House revealed wood remains and an array of comestibles including coffee, sunflower, black walnut, beechnut, maize, squash, and fleshy fruits (raspberry/blackberry, cherry, elder, grape), along with various weed seeds and fungi (McKnight 2016; 2021). Two flotation samples from the Hoke House contained extremely well-preserved organics, with wood, maize, peanut, squash/pumpkin, seeds of fleshy fruits (cherry, elder, grape), and seeds from jimsonweed and yellow poplar (McKnight 2024).

The Carty-Miller study bolsters our understanding of the history and lived landscape of the Catoctin Furnace industrial village. A growing macrobotanical dataset from 19th century loci within the community provides evidence of a nuanced ethnobotanical history among Furnace worker households. Local plant resources (endemic trees for fuel, building material, and hard and soft mast), farmed crops, garden and orchard produce, and imported provisions are represented across the village domestic landscape.

WORKS CITED

Brown, Melvin and Russel Brown
1987 *Herbaceous Plants of Maryland*. University of Maryland, College Park.

Brown, Russel and Melvin Brown
1972 *Woody Plants of Maryland*. University of Maryland, College Park.

Edlin, Herbert L.
1969 *What Wood is That? A Manual of Wood Identification*. The Viking Press, New York.

Fritz, G. and M. Nesbitt
2014 Laboratory Analysis and Identification of Plant Macroremains. In *Method and Theory in Paleoethnobotany*. Edited by John M. Marston, Jade D'Alpoim Guedes, and Christina Warinner. Pp. 115-146. University Press of Colorado, Boulder.

Martin A. and W. Barkley
1961 *Seed Identification Manual*. University of California Press, Berkeley.

McKnight, Justine
2016 *Report on the Analysis of Flotation Samples Collected from Site 18FR1043, Frederick County, Maryland*. Prepared for Catoctin Furnace Historical Society. October 28.

2021 *Report on the Further Analysis of Two Flotation Samples Collected from the Forgeman's House, Site 18FR1043, Frederick County, Maryland*. Prepared for Catoctin Furnace Historical Society. May 26.

2024 *Report on the Further Analysis of Two Flotation Samples Collected from the Hoke House, Catoctin Furnace Site, Frederick County, Maryland.* Prepared for Catoctin Furnace Historical Society. July 15.

Montgomery, F.H.
1977 *Seeds and Fruits of Plants of Eastern Canada and Northeastern United States.* University of Toronto Press, Toronto.

Panshin, Alexis and Carl deZeeuw
1980 *Textbook of Wood Technology*. Volume 1, 4th edition. McGraw Hill, New York.

Pearsall, D.
2000 *Paleoethnobotany: A Handbook of Procedures.* Second Edition Academic Press, San Diego.

Schopmeyer, C.S.
1974 *Seeds of Woody Plants*. Agricultural Handbook 450. United States Department of Agriculture, Washington D.C.

USDA, NRCS
2025 The PLANTS Database (http://plants.usda.gov). National Plant Data Team, Greensboro, NC 27401-4901 USA.