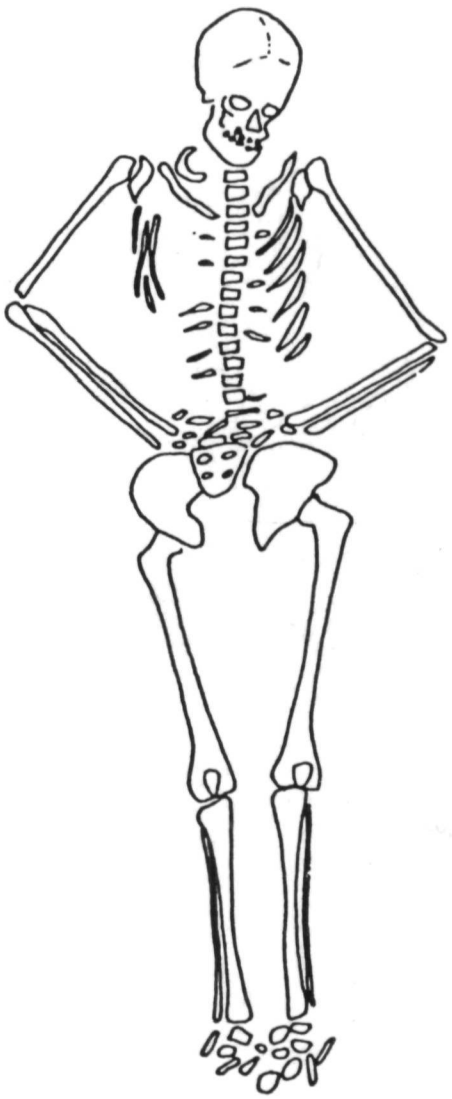
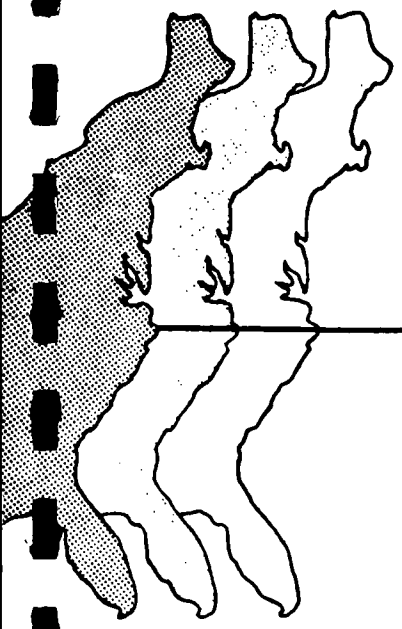
ARCHÆOLOGICAL DATA RECOVERY AT CATOCTIN FURNACE CEMETERY

appendices



FREDERICK COUNTY, MARYLAND

JANUARY 1981



appendices

Western Maryland Regional
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APPENDIX I

Historic Documentation Report

Research of the Catoctin Furnace Cemetery

The identities of the blacks buried at the Catoctin Furnace cemetery remain uncertain. Through research in Frederick County, at the Catoctin site, and in Annapolis, this researcher attempted to document the Catoctin slaves and what appears to be their cemetery. Because literature and documentation of slaves is frequently scarce and difficult to locate, this researcher did not expect to find a list of the blacks who were buried in the cemetery between 1790 and 1840. For this reason, this researcher examined the accounts, probate records, and various papers of the men who owned the furnace during this fifty year period. What was discovered was that all furnace owners between 1790 and 1840 owned slaves and that slave labor was the standard form of furnace operation. However, no actual reference of Catoctin Furnace slaves nor a record of the cemetery could be located.

A brief history of the Catoctin Furnace's owners is necessary to understand this report. A history was compiled by a researcher for the Catoctin Project and is repeated below. This researcher claims no credit for compiling this history and only paraphrases someone else's work.

The land of the Catoctin Furnace was patented by Dr. Charles Carrol in the 1750's. Before he was able to begin construction of an Iron Works on the property, Carrol died and the land was sold to the Johnson brothers: Thomas, James, Baker, and Roger. The brothers built the first Catoctin Furnace and put it into operation sometime during the Revolutionary War and may have supplied weapons for the Continental Army. The furnace was rebuilt in 1787 and the brothers shared operation until 1793 when Thomas and Baker became the sole owners. In 1803 Baker bought Thomas' 2/3 share and became the only Johnson brother still involved with the furnace.

Between 1803 and 1813, Baker leased the property out to Benjamin Blackford. In 1813 Thomas and Willoughby Mayberry purchased the Furnace and operated it until John Brien bought it in 1820. Brien died in 1843 and the Furnace was sold to Peregrine Fitzhugh who ran it alone until Jacob M. Kunkel became his partner in 1848. Together they added a second furnace in 1857. When Kunkle died in 1885, Furnace operations ran only sporadically until the Catoctin Furnace finally shut down in 1903.

This researcher could find little information concerning Blackford, the Mayberrys, or Brien but wonders if they had any family relation to the Johnsons. Instead, the histories of these men remain obscure.

This researcher began her work in Frederick, Maryland where records in the County Courthouse, Winchester Hall, the Frederick County Historical Society, and the public Library were examined. The Library and the Historic Society were valuable in providing background information of the Johnson brothers. Thomas and Baker Johnson were influential lawyers in the political as well as the economic world.[1] Baker served as a Colonel during the Revolutionary War and his brother Thomas became the first Governor of Maryland and consultant to men such as George Washington.[2]

Thomas, Baker, and James Johnson were all slave owners; information concerning Roger's slave holding practices could not be found. In 1790, Thomas owned thirty-eight slaves and Baker held twenty-three. According to the 1800 census, Thomas owned fifty slaves while Baker owned thirteen. James could not be located in the Frederick Census, yet there are several slaves listed in his 1811 will.[3] In his will, James refers to slaves in connection with a Mill and Furnace he operated on the Potomac; a practice shared by other furnace operators. In 1767, for example, the Hampton Furnace in Frederick County was sold with its slaves and "other implements belonging to the works."[4] Thus, it would not be unnatural for the Catoctin Furnace to be worked by slaves.

With some knowledge of the Johnson family, tax records were sought to find some evaluation of the Furnace. This researcher was sent by Court house archivists to Winchester Hall where she was told that no tax records for Frederick County were kept prior to 1890. At the public library this researcher learned that such records did exist but that they were destroyed in an 1860 fire at the Court House. The Court House did have the Wills of James and Baker Johnson which both contained slaves and references to the furnace. Baker Johnson's Will is important because it contains seventy-one slaves, some of which may have worked at the furnace. According to the 1800 census, Baker owned only thirteen slaves.[5] Either he purchased fifty-eight more slaves by 1811, when the Will was written, or some of the slaves worked at the Furnace and did not live in Baker's household; censuses refer only to persons living in a particular home. If Baker's wealth increased markedly since 1800, he could have afforded to purchase additional slaves for his private use. Baker would have needed a large farm to require the use of so many slaves.

Baker's Will is also valuable in that it reveals some aspects of his slaves' existence. From occupations such as waiters and waggoners, it can be concluded that Baker used both domestic and farm slaves. This list also contains slaves currently from home which indicated that Johnson lent his slaves out to relatives, such as his son Baker. There are also slaves listed as working at the "Vineyard" which provides more evidence that Baker's slaves worked off his farm. Therefore, even if the seventy-one slaves were not specifically Furnace slaves, they may have worked there at some point in their lives. The roles of these slaves is still uncertain, therefore, probate records were searched for some indication of the manner in which they were employed. Neither Baker's inventory nor any other probate records could be located.

Baker Johnson willed the Catoctin Furnace along with seven slaves apiece, to his daughters. This researcher wondered whether Baker chose to leave his daughters slaves which were experienced with the operations of a Furnace. Instead of leaving his daughters young males to continue operations, Baker left them a majority of females. The sex ratio of the slaves which appear in Baker's Will is equal; thirty-five males and thirty-six females. There are eight sets of husbands and wives and many other kinship ties are provided. This was a slave community of families and Baker attempted to keep nuclear family units together as he divided his slaves among his wife and six children. This, rather than leaving his daughters furnace operators, was Baker's goal.

In Frederick this researcher also visited Mrs. Clem Gardner at Auburn House and Mr. William Renner in hopes of finding more leads to establish concrete evidence concerning the cemetery. Mrs. Gardner showed this researcher a history of the Harriet Chapel in Catoctin. The history was written by Louise McPherson who stated that; "Harriet Chapel held special services for the negroes who were either slaves or employed in the neighborhood."[6] Harriet Chapel's records were burned, therefore, Ms. McPherson's claim could not be substantiated by this researcher. However, if this statement be true, it would suggest that there was no black Church near the cemetery.

Mr. Renner is the only person in Frederick who knew about the cemetery prior to its excavation. Yet, he has no knowledge of its history or use. The only reference Mr. Renner could produce was an undated article concerning the Catoctin Manor. The article stated that the "old Catoctin Furnace property . . . was operated during the period of slavery by Negro slaves."[7] References such as those provided by Mrs. Gardner and Mr. Renner were the only sources this researcher could find which placed slaves specifically on the Catoctin Furnace site.

Frederick County did have slaves although they did not comprise a large percentage of the population.[8] In 1800, for example, the total population of Frederick County was 31,523: 26,478 were white; 4,572 were slaves; and 473 were free blacks. In 1790, the first United States census recorded 3,641 slaves in Frederick County, in 1820 the number of slaves peaked at 6,685. The slave population increased by roughly 1,000 persons per decade between 1790 and 1820. This increase could in part be due to the importation of slaves into the United States. All of the twenty-six bodies excavated at Catoctin were identified as pure Negroid, therefore, it is possible that Africans were continuously being brought into Frederick. After 1820, however, the slave population began a consistent decline. The largest decrease occurred between 1830 and 1840 when the population dropped by almost 2,000 slaves. Interestingly, this drop corresponds with the last use of the Catoctin cemetery. During this same ten year period, the white population also decreased, but unlike the slave population, it increased again after 1840. The obvious question becomes what was happening to decrease the number of slaves. Manumissions, death, and sale are all possibilities but no documentation could be found. Slave populations varied in other Maryland Counties as well, therefore, Frederick is not an isolated example.

An interesting aspect of Frederick is its free black population which grew from 213 in 1790 to 4,957 in 1860.[9] Perhaps free blacks were attracted to Frederick by employment opportunities and attempted to migrate there although free black movement was severely restricted. In terms of percentage, free blacks were long in becoming an influence in Frederick. Yet, their existence indicates that free blacks were employed in the Catoctin area and may have had contact with Catoctin slaves. No record establishing whether the Furnace hired free blacks could be found.

In Annapolis this researcher found the only document which could place slaves on the Catoctin Furnace. In 1834, John Brien, then owner of the Furnace, died intestate.[10] His property was carefully inventoried, assessed, and finally sold. Because Brien left no will, $2,425 was required to carry out furnace operations before it could be sold.[11] Inventories were taken of Brien's property worth a total amount of $73,537.72. He owned half of the Antietam Furnace which produced a considerable amount of iron and was operated by forty-seven slaves valued at $9,310. The only mention of the Catoctin Furnace appears at the end of the Antietam inventory in the following statement; "The amount of Inventory at Catoctin Furnace and elsewhere belonging to the estate of John Brien deceased." That amount was $38,614.77 which is the same figure as the assessment of the inventory which precedes the Antietam inventory.[12] Brien's records do mention Auburn, thus, it is possible that he lived on the Catoctin property. There are several items in this inventory which suggest that this is an inventory of the Catoctin Furnace. The inventory contains 5855 cords of wood valued at $1,765.50, stoves in workmen's houses worth $195, flasks and powder at $1,000, 80 Torr Blurris worth $3,600, and 8 Torr Bar Iron valued at $5,025. Of the slaves listed in this inventory, nine were men whose values ranged from $200 to $450. The high values of these slaves does not necessarily mean that they are skilled slaves. These prices are consistent with slave prices in Virginia for a young unskilled male slave, although they are much higher than prices in Delaware for the same period. Yet, these were valuable workers and six of the nine males were appraised at $350 or above. One slave, Bill, was eventually sold from Brien's estate for $500 which suggests that Bill was a very strong and healthy slave.

The values of these slaves are no less than that of the Antietam slaves which are known to have worked at the Furnace because they appear in its inventory. All but three of the Catoctin slaves were purchased by Henry Brien.[14] The sale list of Brien's property does indicate kinship ties among the slaves and suggests that Henry Brien was the next person to own the furnace before it was purchased by Peregrine Fitzhugh. Henry Brien purchased most of John's estate including patterns and furnace tools valued at $1,100 and charcoal worth $800. It is possible then that some of the slaves buried in the cemetery worked the Furnace for John Brien.

As this report indicates, no information could be found concerning the cemetery at Catoctin. The fact that the blacks buried in the cemetery were pure Negroid suggests that either blacks were continuously brought into Frederick, or that Frederick blacks managed to live, for fifty years at least, in a white society and remain purely black. The possibility that no mulatto children were born for fifty years is quite surprising. Even if black immigration was consistent, why are there only negroids buried in the cemetery, surely there were mulattoes, where were they buried? The question of the origin of these blacks is one that this researcher cannot answer.

Another problem with the cemetery is the manner in which the blacks were buried. Would native Africans choose to bury their dead dressed in shrouds and laid in pinch-toe coffins? Are head and toe markers and

placing heads toward the west elements of African culture? Edward F. Heite, Delaware State Archivist, believes that this burial manner suggests that these were "thoroughly Christianized negroids."[15] Mr. Heite believes that these blacks were following Christian rites by their own choice. This researcher claims no in depth knowledge of African customs, but has studied burial customs enough to believe that this burial practice is European and therefore Christian. However, this researcher does not necessarily agree with Mr. Heite that these were Christianized blacks, especially if they were African born. Whites frequently ordered blacks to follow white customs and it is possible that whites initiated the cemetery.

In the days spent researching the Catoctin cemetery, this researcher made only a dent in the vast material available on the Catoctin Furnace. However, she questions whether any documentation of the cemetery can be found. A great deal of time would be required to thoroughly search all documents, but for the limits of this project, this researcher was able to locate some proof that slaves at least lived on the Catoctin Furnace site.

Diane Gallagher
1980

FREDERICK POPULATION BREAKDOWN

	WHITES	FREE BLACKS	SLAVES	TOTAL
1790	26,957	213	3,641	30,791
1800	26,478	473	4,572	31,523
1810	27,983	783	5,671	34,437
1820	31,997	1,777	6,685	40,459
1830	36,703	2,716	6,370	45,789
1840	28,975	2,985	4,445	36,405
1850	33,314	3,760	3,913	40,987
1860	38,391	4,957	3,243	46,591
1870	39,999	7,572		47,572

CHANGES IN FREDERICK'S POPULATION

	WHITES	FREE BLACKS	SLAVES	TOTAL
1790-1800	- 479	+ 260	+1151	+ 732
1800-1810	+1505	+ 510	+1099	+2914
1810-1820	+4014	+1006	+1014	+6022
1820-1830	+4706	+ 939	- 315	+5330
1830-1840	-7728	+ 269	-1925	-9384
1840-1850	+4339	+ 775	- 532	+4582
1850-1860	+5077	+1197	- 670	+5604
1860-1870	+1608	+2615		+ 961

JOHN BRIEN'S SLAVE LIST

NAME	CLASSIFICATION	INVENTORY VALUE	SALE PRICE
Wally	man	$350	
Christiana	women	$100	
Harrison	boy	$225	$1000
George	boy	$150	
Henry	boy	$100	
Lucy	woman	$250	$400
Ann	girl	$100	
Sarah	girl	$150	$200
Lucky	woman	$100	
Charity	girl	$100	$900
Eliza	girl	$100	
Bill	man	$450	$500
Isaac	man	$400	probably included with Lucky and her daughters
George	man	$450	$400
Peter	man	$275	probably included with Lucky and her daughters
Bob	man	$225	$200
David	man	$200	$150
Harry	man	$400	$400
Leonard	man	$350	$400
Stacy & 2 Children		$450	?

BAKER JOHNSON'S SLAVE LIST

To Baker:

Big Dick, Jane (his wife), Will (her son)
Old Jack, Magdeline (his wife), Sal and Joe (their children)
Clem
Yellow Girl
Elsey
Resey, and Cloay (his wife)
Jack (son of Jack)

To William:

Sam, Sue (his wife), Cate, Ally, Rose (their children)
Samuel
Mill
Bill (Poll's son)
Wally
Farm Jacob
Old Will and Estor (his wife)

To Baker's wife:

Toby and Janey (his wife)
Sue
Larkin
Ben (Waiter)
Bill (Waiter)
Sam
Priss and Harriet (her daughter)

To Charles:

Bill, Harry, Mingo (sons of Jack) presently at the Vineyard
Nanny (Janey's daughter)
Collier Sam
Little Bill
Humbert
Hanson Brook (Lorsers son)

To Catharine:

Nell and Frederick (her son)
Waggoner Henry (Poll's son), Milly (his wife), and Ann, Jane (their daughter)
Parris and Betty (daughters of Magdeline)
Charlot (daughter of Janey)

To Julian:

Jane and Mary (her daughter)
Harvey the Wagoner
Mattie
Maria (Priss' daughter)
Lewis and Romeo (Poll's sons)

To Matilda:

Liddy, Betty and Lorena (her daughters)
Mary (at Baker's)
George (Lock's son)
Hetty (Priss' son)
Big Bill Humbert

To Caroline:

Lock (at the Vineyard), Jacob (her son)
Lusinda (Priss' daughter)
Christina and Len (her son)
Ned (Priss' son)
Old Hanna

NOTES

[1]Thomas Johnson Papers. Available in the Frederick County Historical Society.

[2]Thomas Johnson Papers.

[3]Will of James Johnson. Available in the Annapolis Archives and the County Court House in Frederick, MD.

[4]John Thomas Scharf page 791.

[5]1800 Census. Available in the Frederick Public Library.

[6]Pamphlet written by Louise McPherson, 1974.

[7]No data on source available.

[8]Scharf, page 369. All subsequent population figures from the same source and page.

[9]Scharf page 369.

[10]Will of John Brien, 1834. Available in the Annapolis Archives.

[11]Probate records of John Brien, John McPherson Administrator. Available in the Annapolis Archives. This source Account: John Brien, December 12, 1834.

[12]Inventories: John Brien's Antietam Furnace, 1834. Page 461 and last page of Antietam Inventory. Available in the Annapolis Archives.

[13]Sales: John Brien, January 15, 1836. Page 355. Available in the Annapolis Archives.

[14]Sales: John Brien, January 15, 1836. Page 355-361.

[15]Previous report on Catoctin Furnace. Excavations at Check 6: Historic Cemetery Site. 1979 Season. Page 12.

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Papers of Thomas Johnson, Frederick Historic Society.

Land Records, Hall of Records, Annapolis.

For a complete list of Frederick Records in Annapolis, see "Shelf List" Hall of Records.

APPENDIX 2

Physical Anthropological Report

National Museum of Natural History · Smithsonian Institution
WASHINGTON, D.C. 20560 · TEL. 202- 381-5456

November 27, 1979

Dr. Kenneth Orr
115 West Main Street
Thurmont, Maryland 21788

Ref: Site 18 FR 323 at Catoctin Furnace, Md.

Dear Dr. Orr:

In reply to your telephone call of this morning I send the following outline of the 25 skeletons excavated by your team under Dr. Ron Thomas, and Sharon Burnston this past season. One feature, #25, produced no bone.

There are 3 new born infants, 8 children, 7 female and 6 male adults, a 2 : 6 : 10 ratio of infants: children : adults quite expectable at this late 18th - early 19th century date. Age at death is 33.1 for females and 36.7 for males, also expectable.

In every case where we have a skull adequately preserved (N = 14) race is Black apparently.

Stature seems about average and there is a big range in degree of muscularity.

There is an apparent lower leg fracture with fusion (#26), a severe and probably crippling fusion of lower lumbars to sacrum (#4), frequent arthritic breakdown of neck vertebrae, signs of rickets, poor teeth, and an apparent large trephination through left parietal (#26). Premature fusion of sutures is common.

The skeletons need some repair still, but our volunteers (largely Karen Kahn taking a GWU museum course) have finished the basic cleaning, stabilizing and preservation of the skeletons, using Butvar solution. We will start to study them soon. There are interesting questions of nutrition, disease, and family relations in the cemetery.

I hope that this brief report is helpful.

I look forward to seeing you, hopefully at a lunch, when you come to Washington.

Very sincerely,

J. Lawrence Angel

J. Lawrence Angel
Curator of Physical Anthropology
Department of Anthropology

National Museum of Natural History · Smithsonian Institution
WASHINGTON, D.C. 20560 · TEL. 202- 381-5456
Effective June 1, 1980 Tel. 202-357-2181

May 27, 1980

Dr. Ronald A. Thomas
Mid-Atlantic Archaeological Research, Inc.
P.O. Box 676, 70 S. Chapel St.
Newark, Delaware 19711

Dear Ron:

Here is a copy of my letter to Ken Orr of last November, as well as a preliminary listing of the Catoctin skeletons. My current guess is that they could well be actual immigrants from Africa. Now that Marisa Gilabert has mended more of them and with the new additions, we (Lise M. Olney and I) can study them and give you a better report.

We look forward to the new skeletons!

Very sincerely,

J. Lawrence Angel
Curator of Physical Anthropology
Department of Anthropology

Enclosures: 2

Physical Anthropological Analysis-Preliminary Results

Feature	Sex	Age	Race	Size, build	Pathology and Misc.
1	?	infant newborn			(only upper third of body, apparently)
2	?	newborn 0+			(whole skeleton, fragmentary) No pelvis. 1 shroud pin + blackened cloth
3	F	22-27	black unmixed	tallish, 159.74	0 births? 2 shroud pins w/black cloth and hair? on skull
4	M?	33-43	black	below medium, 167.77	femur bowed laterally; nutrition? Apparent fracture upper sacrum and lower lumbars? Probable kyphosis. Neck arthritis.
5	F??	3 +	black		skull only
6	M	30-40	black apparently	medium, 169.87	copper stain rt. femur (possible rickets) femora bowed laterally
7	F	35-45	black unmixed	medium, wiry, 152.90	Neck arthritis. Sulcus suggests births. Upper shaft slightly bowed laterally.
8	M	50-65	black	average +, 170.08, quite muscular, esp. humerus	Bad neck arthritis
9	M?	14-15	black	medium	lousy teeth, carious
10	F	24-30	black	medium +, 159.62	black discoloration on femora
11	F	35-47	black	wiry, muscular short, 149.02	Sacroiliac suggests some births, left wrist occupational stress
12	M??	3-	black?		Femora bowed. Hypoplastic line on I^1
13	M?	12-13	black (hybrid?)	medium	

Feature	Sex	Age	Race	Size, build	Pathology and Misc.
14	F	45-60	?	very short, slender, fragile 146.74	upper femora bowed laterally, esp. left. Terrific tartar, bad teeth. Bone condition poor. Tibia periostitis.
15	M	17	black	medium-	Scapho-cephalic. Premature closure of sagittal suture.
16	? (M)	Young Child 2 ca.			fragmentary
17	M??	5+	(black)	shortish	Rickets, femora bowed, antero-laterally
18	F	21-23	black	medium 158.71	Vertebral body inflammation under discs. Big teeth. M^3 impacted. Some births, judging by sacroiliac. Possible trace rickets.
19	?? (F)	2+			Poor condition. Fragmentary
20		probable fetus			Extremely fragmentary
21		" " ?			Possibly human. Possibly infant. Only 3 or 4 sherds
22	M	18-24	black ??	medium-, 166.80	Very long head. Not yet muscular
23	F	20-30	black apparently	medium-, slender, 155.41	left frontal, copper/brass stain
24	M?	11-13	black	slight, smallish	
25	-	-	-	-	small piece dried tissue, origin? from disturbed soil, omit

Feature	Sex	Age	Race	Size, build	Pathology and Misc.
26	M	43-55	black?	tall, 180.69	Neck arthritis. ++ arthritis of cervicals and lumbars. + wrist arthritis. Teeth very poor. Left parietal large hole, feather edge healed in life. Possible trephination. Fusion lower quarter, left tibia, fibula, ankle joint "sprung". Potts fracture? Rt. ankle, stress above ankle. Left gluteal insertion porous exostosis points laterally.
28	?	0+ newborn	?	fragmentary	
29	?	0- late fetus	?	fragmentary 5 or 6 fragments of skull esp. petrous	
32	M	60-70	black?	Average, "massive", "saber" tibiae	Tibial shaft periostitis, bilateral. Infection, possibly treponemal.
33	M?	21-27	black	average, very slender 171.55	No arthritis apparent
34	?	1-2 yr. child	?	? too fragmentary	Premature closure of sagittal and apparently coronal sutures ? cause of death?
35	F	45-57	black	tall, slender 163.73	Poor lower teeth. Left acetabulum extended rim. Hip stress, occupational?
27, 30, 31			No skeletal remains		

medium M stature=171.62 (N=7)
medium F stature=156.36 (N=8)

APPENDIX 3

Nail Typology and Chronology

Analysis of Coffin Nails and Screws

Catoctin Check #6 Cemetery

Of the 894 artifacts found in association with burials, 835 or 93.4% were either nails (821) or screws (14). Because of the general absence of more diagnostic artifacts, and lack of information about the historical utilization of this cemetery, an intensive analysis was done of all nails and screws primarily to determine the dates of use of the site.

Handling each feature individually, the nails and screws were initially cleaned with water and a coarse brush. In all cases, however, the wood surrounding the nail had oxydized with it to form a thick coating, which made analysis virtually impossible. To remedy this problem, the nails and screws were boiled in a 20% citric acid solution for between 25 and 40 minutes. In order to clean away any remaining acid, the nails and screws were then boiled several times in distilled water. After this procedure was completed, all of the artifacts' attributes could usually be determined.

Nail and screw types represented at this site, along with components attributed to each type, are as follows:

Hand wrought nails - Prior to the 1790's, this was the only nail type in existence. The four sides of its shaft always decline toward the point. Its head is hand-made and the iron fibres run lengthwise to the shank.

Machine cut/hand-headed nails - Nail cutting machines were first used in the 1790's, but heads continued to be finished by hand until about 1820. Only two sides of the shank decline towards the point, while the other two are parallel. The earliest machines (1790 - 1810) cut nails in such a way that the burrs can be seen on two sides of the shank. Nails produced by machines from 1810 to 1900 show burrs on one side only. Iron fibers in this type always run cross-wise to the shank, and continue to do this in cut nails until 1830.

Machine cut/machine-headed nails - The production of machine cut nails with machine cut heads started in the 1820's and continued in popularity even after the introduction of wire nails (1850) until the beginning of the 20th century. As with the hand-headed variety, two sides of the shank decline towards the point with two sides remaining parallel. As mentioned previously, burrs on this type are on one side only and iron fibres run crosswise to the shank until 1830. Because of the problem with this type of nail in clinching, a new technological advance was made in the cutting method at this time. As a result after 1830 the iron fibers run length wise to the shank, as they had in the hand wrought nail.

Wood screws - This term is sometimes misinterpreted as meaning a screw made of wood, however, these screws are all of a ferrous alloy. Those represented at this site are of a type made from 1800 to 1843. Characteristic of this screw type is its blunt tip.

Edward Flanagan

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APPENDIX 4

Metallographic Analysis

Metallographic Report on the Catoctin Nail (18FR323)

The nail (Plate 1) is 61 mm in length, with a head that measures 14 mm across, and a shaft diameter of 7 mm, including oxidation. The maximum shaft diameter of uncorroded metal is 3 mm. This dimension is compatible with the use of 1/8th inch iron nail-rod stock in the manufacture of the nail. The nail is corroded to such an extent that it is not possible to estimate its original length accurately; however, sufficient metal remains for metallographic study.

The specimen was cut lengthwise on an Isomet diamond-impregnated cutting wheel, pressure mounted in a thermoplastic matrix, then polished with successively finer abrasives, down to 0.05 micron alumina, until a mirror-like finish was attained. The specimen was then etched with two percent "nital", nitric acid diluted with ethyl alcohol, to bring out its microstructure.

Microscopic examination indicated that the nail is a wrought iron composed mostly of ferrite, with a dark band visible to the naked eye, running longitudinally down the length of the shaft (Plate 2, between arrows). This dark band is a hypoeutectoid steel containing lamellar pearlite (Plate 2, a), and an embryonic Widmanstätten structure (Plate 2, b). Parallel stringers of slag are also present in the shaft, oriented longitudinally (Plate 2, c). That is, the grain of the nail runs lengthwise.

Construction of the nail's shaft can therefore be interpreted as a piece of mild steel sandwiched between two pieces of wrought iron. The steel differs from the surrounding wrought iron not only in its greater degree of carburization, but also in its larger grain size and relative lack of hammered-in slag. The abruptness of the transition from wrought iron to steel, and the presence of slag stringers along the transition zones further suggest the presence of welded seams. Such a structure could result, on the one hand, if a smith happened to include a piece of scrap steel when fabricating his nail/rod, or, on the other hand, if a region of incompletely decarburized metal survived the heating and forging that comprised the industrial procedure for converting smelted pig iron, with a carbon content of about four percent, to a carbon-free wrought iron.

Widmanstätten plates, mentioned above, form when large grains of hypoeutectoid steel cool after having been heated into the austenitic range, the threshold of which varies depending upon carbon content. Cooling causes pure iron, ferrite, to precipitate within the austenitic grain, along the {111} crystal plane. For this nail, we estimate a final heating temperature of somewhat over 800°C.

The lamellar state of the pearlite between the Widmanstätten plates in the steel portion of the shaft indicates that the smith had finished pointing the nail before it had cooled below about 730°C. Forging pearlite below its eutectoid point (723°C) hastens the break-up of the lamellae,

and causes the dark phase, carbide (Fe_3C), to segregate into spheroids. Spheroidization does not seem to have occurred in this nail.

When iron is cold worked, its grains become deformed; when it is heated subsequently, its grains recrystallize into regular, equi-axed polyhedral forms. If forging is carried out while the metal is still hot, recrystallization occurs immediately. The size of the resultant grains depends upon the temperature and degree of deformation. Regions of very fine grains can be seen around the edges of the nail's head (Plate 3). The small size of these grains reflect the smith's final blows to the cooling nail.

These last blows were delivered by "upsetting", that is, striking the piece of metal end-on, parallel to its long axis, spreading the nail's head. Upsetting is evidenced in the head of this nail by the divergence and disruption of the slag stringers, which had run parallel to each other in the nail's shaft.

In conclusion, a nail with a mild steel core, such as this one has, would be less likely to bend than one made completely of soft wrought rion. However, until we know if the structure of the Catoctin nail is typical of the nails of its period, we cannot state with any confidence whether its construction took deliberate advantage of the structural properties of steel-coring, or whether it was merely fortuitous.

A Note on the Terminology of Iron-Carbon Alloys

"Austenite" is the high temperature alloy of iron and carbon. It has a face-centered cubic crystal structure, exists only at temperatures above 723°C, and can dissolve as much as two percent carbon, depending upon temperature.

Low temperature iron, called "ferrite", has a body-centered cubic crystal structure, and can dissolve virtually no carbon. Carbon in low temperature steel takes the form "carbide" (Fe_3C), and is segregated from the ferrite.

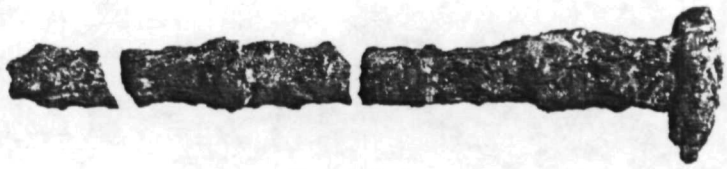
In low temperature, low carbon alloys, carbide occurs as a constituent of "pearlite", which is comprised of alternating lamellae of carbide and ferrite.

Reference

Brick, Robert M., Alan W. Pense, and Robert B. Gordon

1977 Structure and Properties of Engineering Materials. McGraw-Hill, 4th edition, New York.

Stephen M. Epstein and
Vincent C. Pigott
MASCA
18 November 1980



CM

Catoctin

18FR323

PLATE 1: Coffin nail from the slave cemetery at Catoctin, Maryland.

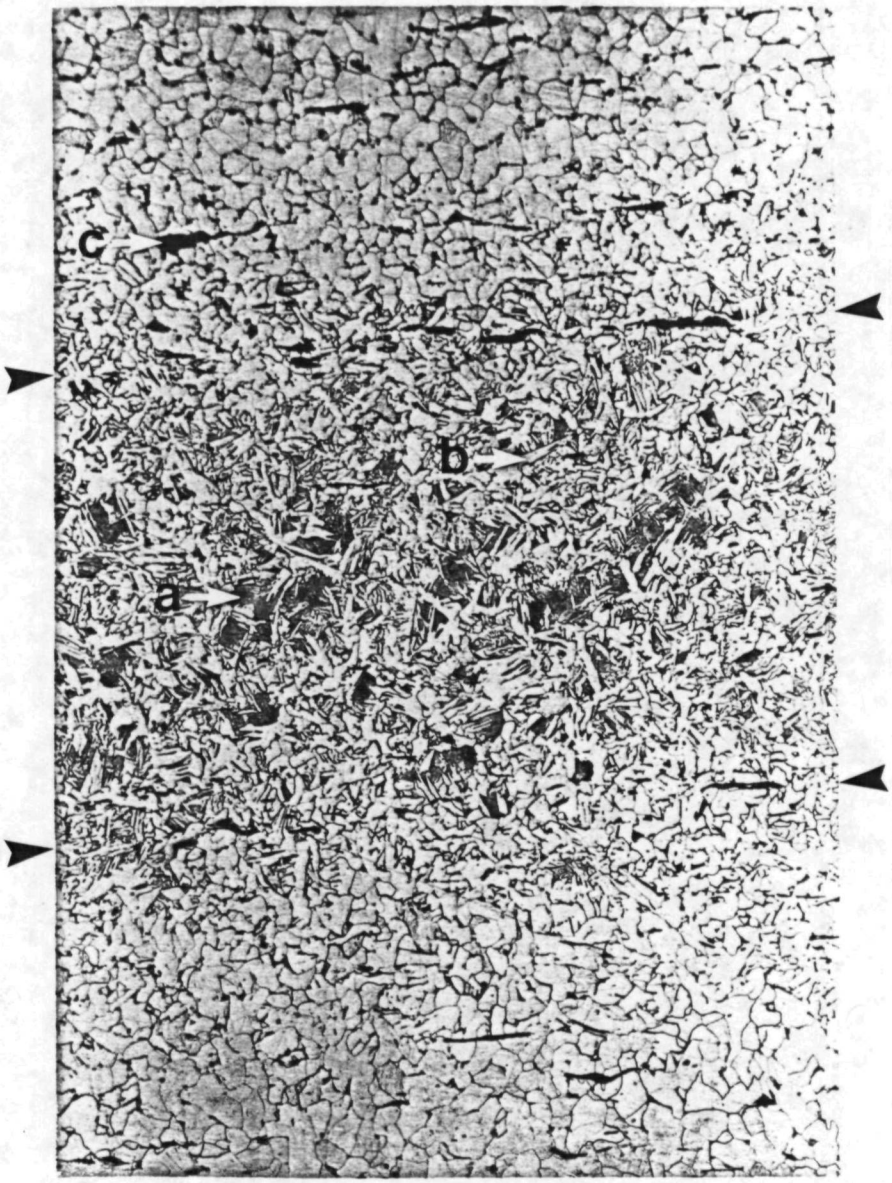


PLATE 2: Photomicrograph (X150, 2% nital etch) of part of the nail shaft, showing regions of wrought iron (between the arrows) on either side of a mild steel core. The core contains pearlite (a), and ferrite in the form of Widmanstätten plates (b). Slag stringers (c) run parallel to the length of the shaft.

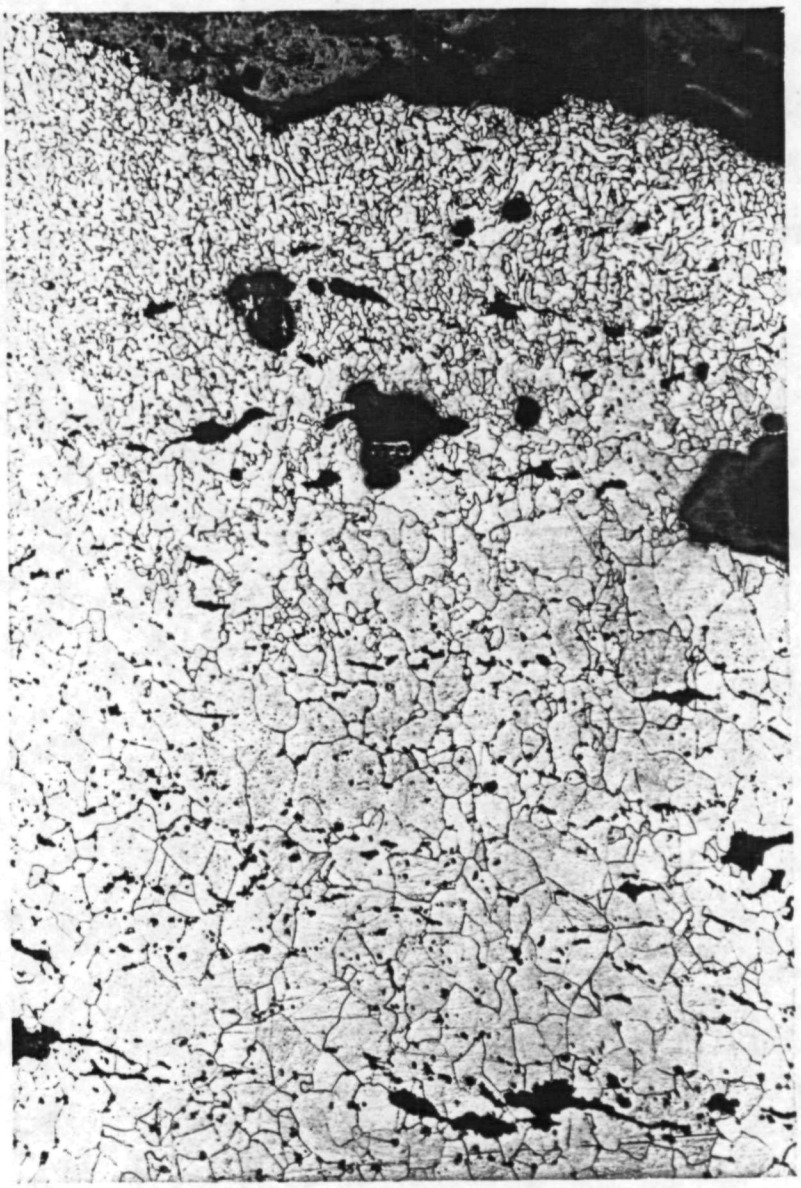


PLATE 3: Photomicrograph (X150, 2% nital etch) of part of the nail's head, showing fine grain structure at the periphery, and the disruption of slag stringers caused by upsetting.

APPENDIX 5

Wood Sample Identifications

WOOD IDENTIFICATION RECORD

Voucher Number 80-9-4

Wood Science and Technology
University of Massachusetts

Project MAAR Catoctin Furnace

Specimen label/tag # 18 FR 323 Catoctin Check 6 Feature 16 Cat #31

Additional source info. Wood Sample.
Submitted by R.F. Hoffman.

Specimen size, description, condition Multiple fragments as splinters up to 3" x ½". Weakened by advanced decay. Areas of sound wood available.

Gross features Wood ring-porous; tyloses abundant; latewood pores numerous, indistinct, in radial arrangement. Rays multiseriate and narrow.

Minute features Not examined.

Remarks Unable to ascertain ray height.

Identified by

R. Bruce Hoadley

Identified as

White oak (group)
(Quercus sp.)

Date 9-17-80

WOOD IDENTIFICATION RECORD

Voucher Number 80-9-3

Wood Science and Technology
University of Massachusetts

Project MAAR Catoctin Furnace / Frederick Co. / MD

Specimen label/tag # 18 FR 323 Catoctin Check 6 - Feature 10

Additional source info. Coffin Wood Sample.

Submitted by R. F. Hoffman

Specimen size, description, condition Large Splinter. Approx 8" x 1" x ½"

Intact, but advanced decay evident

Gross features Ring porous hardwood; tyloses present; Vasicentric pores numerous, in dendritic arrangement. Rays all narrow

Minute features Rays uniseriate.

Remarks

Identified by

R. Bruce Hoadley.

Identified as

Chestnut

(Castanea dentata)

Date 9-17-80

APPENDIX 6

Textile Fiber Analysis

Identification of Fiber Samples

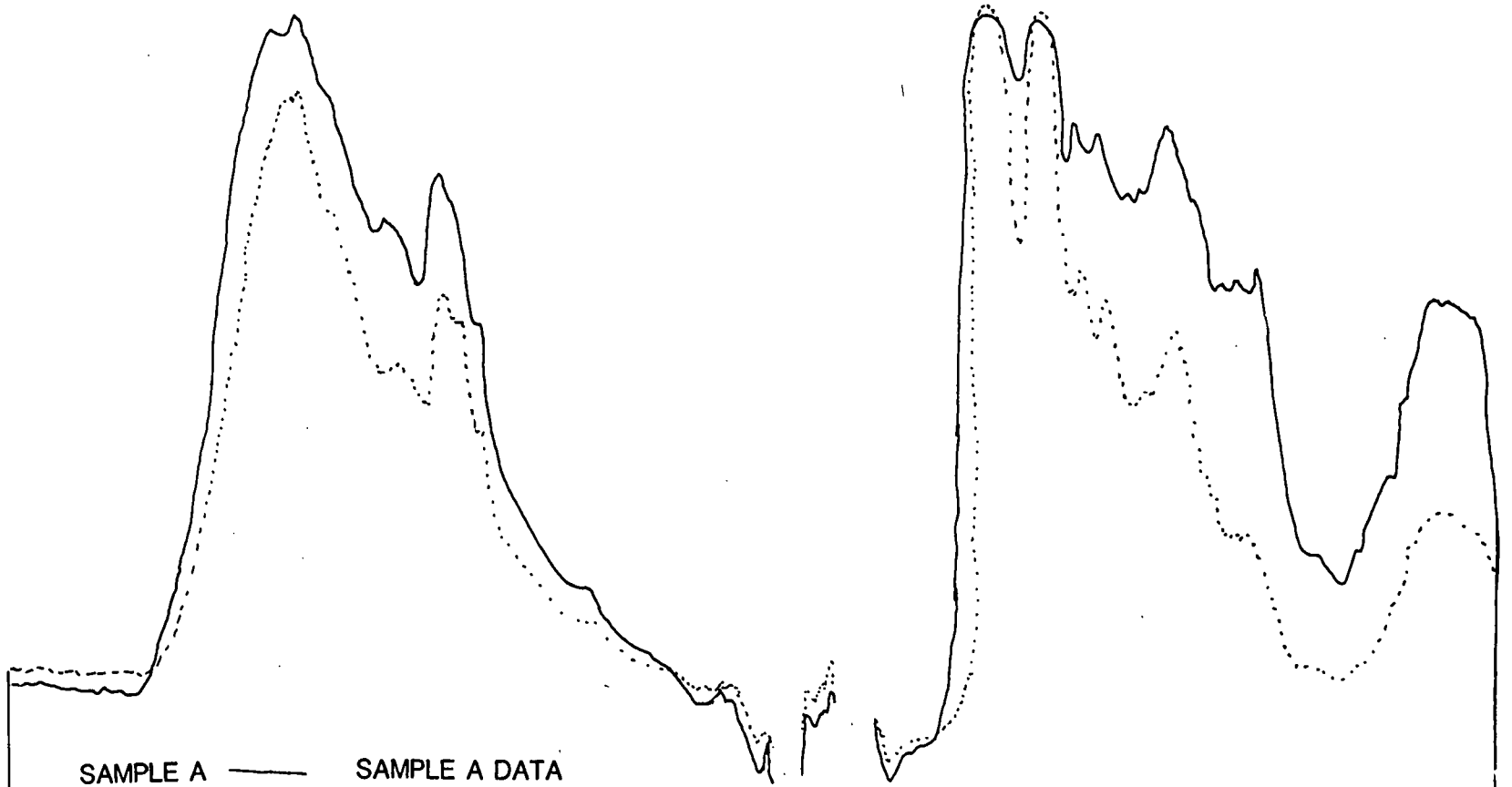
Two fiber samples from Catoctin cemetery were analyzed, sample A from Feature 6, just under the cranium, in association with a button, and sample C from Feature 3, just over cranium, in association with a pin. Examination of these samples by electron microscope gave use false clues, probably because the material had aged. At this time, however, cotton was correctly eliminated as a possibility.

During the last month Ellyn Cottington has placed the samples and reference materials in a Fourier Transform Infra-red spectrometer (range 4000-500 wave numbers). Every substance absorbs certain wave lengths of light (wave numbers) because of its chemical composition. This is a powerful identification tool because the absorption curves are very specific. To compare substances one not only compares the general curves but also certain wave numbers that represent certain chemical formations.

Both samples were of protein material -- this means wool, hair, etc. that animals grow. Ellyn took great care to make sure that she sampled only fabric, so human hair can be eliminated as a possibility. In short, both samples are most likely to be wool. The possibility of other animal hairs is small. The samples were also checked against the best spectra available for the linen, flax family, and there seem to be no resemblance.

Note that slight variations in curve are normal and due to mechanical factors, contaminations, and so on.

SAMPLE A ABSORPTION SPECTRA



SAMPLE A ——
100% WOOL .....

11/8/80

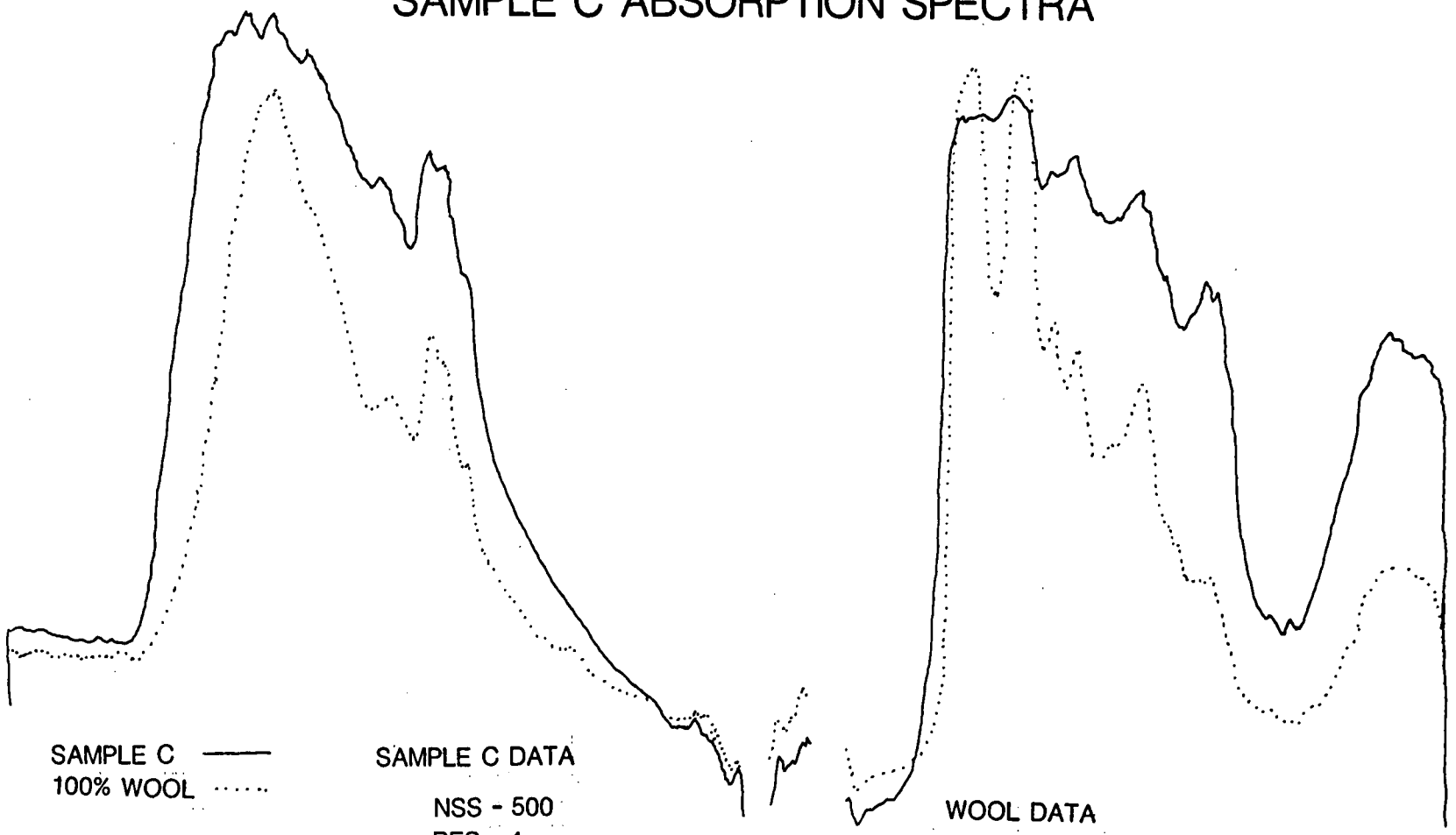
SAMPLE A DATA
NSS - 500
RES - 4
PLM - A

STP - 4000
ENP - 500
MXY - 110
MNY - 15

SFL - SAMA
RFL - MTDI6

WOOL DATA
SFL - 100WOOLDC
NSS - 1000
MXY - 115
MNY - 10

SAMPLE C ABSORPTION SPECTRA



SAMPLE C ——
100% WOOL .....

11/8/80

SAMPLE C DATA

NSS - 500
RES - 4
PLM - A

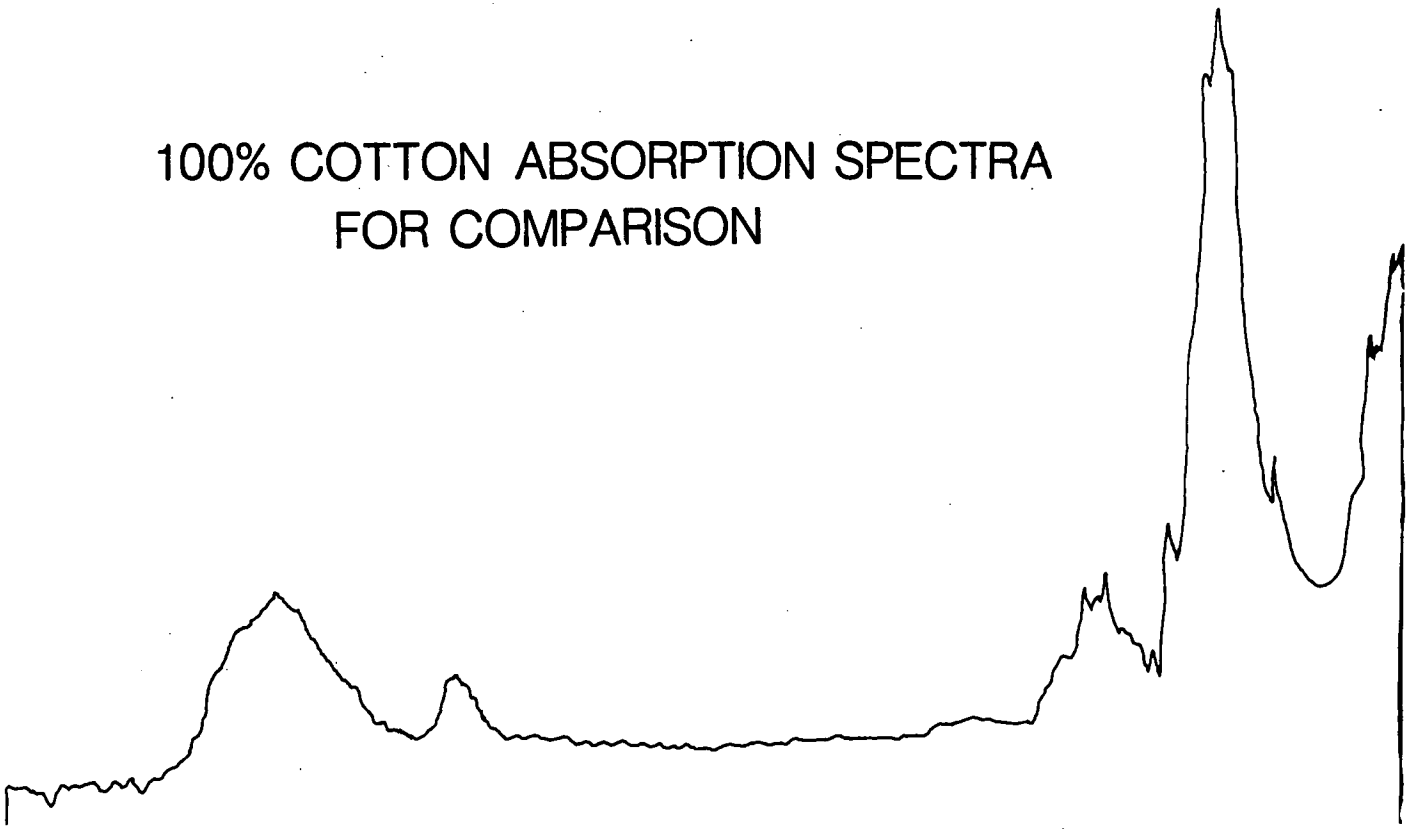
STP - 4000
ENP - 500
MXY - 140
MNY- 25

SFL - SAMC
RFL - MTDI6

WOOL DATA

SFL- 100WOOLDC
NSS - 1000
MXY - 115
MNY - 10

100% COTTON ABSORPTION SPECTRA FOR COMPARISON



100% COTTON —— COTTON DATA

11/17/80

RES - 4
PLM - A

STP - 4000
ENP - 500
MXY - 50
MNY - 6

SFL - 100COTTON
RFL - KRA4A
NSS - 500

APPENDIX 7

Seed and Soil Sample Analyses

Seed and Soil Samples from Catoctin, Maryland

Identification

Six soil and seed samples from the Catoctin burial site in Maryland were examined under a binocular microscope at 10X. The three samples from the thoracic cavities of skeletons (samples from Features 13, 10, and 8) did not contain any paleoethnobotanical materials. In contrast, the sample from Feature 21 (due west of cranial area) contained a very large number (over 100) of uncharred seeds of raspberry or blackberry (Rosaceae Rubus sp.). A seed sample was taken from the top end of the coffin of Feature 22. This sample also contained fruit seeds including an uncharred fragment of a peach pit (Amygdalus persica) and a single blackberry or raspberry seed (Rosaceae Rubus sp.). In addition, a large number of sassafras (Lauraceae Sassafras albidum) seeds were recovered from the sample. Similarly, Feature 15 (sample taken from over tibial area of coffin) also produced large number of sassafras seeds. A list of the plant species identified is presented in Table 1. All seed material was in an uncharred condition. Identifications were aided by reference to Martin and Barkely (1961), Gaertner (1953), and Montgomery (1977).

Interpretation

Sassafras, as well as raspberries, grow well in disused fields and similar environments. If sassafras and raspberries were growing around the Catoctin burial site, this might explain the presence of these seeds in the soil samples. The identification of raspberry, peach, and sassafras would rule out the possibility of a floral offering.

Pam Jean Crabreee
MASCA
October 1980

Table 1--Botanical Material Identified

from the Catoctin Site

Feature	Seeds
10--thorax	No ethnobotanical material
13--Thorax	No ethnobotanical material
8--Thorax	No ethnobotanical material
21--Due west of cranial area	Large quantity Rosaceae Rubus sp. (blackberry/raspberry)
22--Top of east end of coffin	1 seed Rosaceae Rubus sp. 1 peach pit fragment (Amygdalaceae Amygdalus persica) Large quantity Sassafras albidum (sassafras)
15--Sample over tibial area of coffin	Large quantity Sassafras albidum (sassafras)

REFERENCES CITED

Gaertner, Erika E.
1953 Key to "Seeds" of Fleshy Fruits. Transactions of the Royal Canadian Institute 30 (1): 33-43.

Martin, Alexander C.; Barkley, William D.
1961 Seed Identification Manual. University of California Press: Berkeley and Los Angeles.

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

APPENDIX 8

Comments of Historical Consultant

Comments of Historical Consultant

We know from the literature that Moravian missionaries were recruited for the purpose of evangelizing the slaves at the ironworks. We also know that the black population of the area has shrunk in the intervening time to zero. At some time, long ago, the last burial occurred here; the person was a hermit who died in an epidemic, according to legend.

The burials in the cemetery are all, apparently, negroids. There are recognizable clusters of burials. There are temporal identifiers, notably the nails used in the coffins. There are no recognized grave goods, except flowers. The burials are all oriented. There are crude markers, and there seems to have been some sense of which spaces were vacant. The groupings appear to have been based on family, since each cluster contains a wide range of age and sex, and at least one cluster displays family resemblances.

Among the negative evidence, there is no record of this ground ever having been used as a church. The Lutheran and Episcopalian church sites can be identified. There are no families with traditions of association with this cemetery. There is no land record that sets aside this plot for purposes of burial or religion.

Having presented the evidence, I now proceed to commit the cardinal sin of creating a research design after the fact. Archaeology, I feel, can answer several interesting historical questions with this evidence.

1. What was the religion of these people?
2. When was the cemetery used?
3. How was the cemetery organized?
4. Who were these people?
5. Did they preserve any pre-Christian customs?

1. As stated above, the people could have been Moravians, or they could have been Christians of another sect, or they could have been pagans. If they were Moravians, they would bury by "choir" with the males and females segregated, and with each interment next to the previous one, regardless of relationship. Among Lutherans, Episcopalians, and Methodists, families bury together and the graves are oriented. Among Baptists orientation is practiced, but not rigorously. We must therefore conclude that these were non-Moravians, or at least that some non-Moravian taught them their burial customs. The community had a stable religion, since there appears to be continuity of custom through time.

2. The cemetery apparently was used from the latter part of the eighteenth century through much of the nineteenth century. I suggest that the proportion of graves with each nail type should very accurately determine the date span.

3. The presence of clusters with intervening spaces seems to indicate family organization. We should examine the apparent sequence of burials within each cluster, to determine if households were buried together, or if the matriarch and patriarch of each clan were buried to the right or the left. The succession of nail types across the cluster may tell us something here. Your physical anthropologist should be able to identify family characteristics and should be able to tell us if the clusters intermarried. We should then compare the patterns with those of known, marked, cemeteries, to see if white citizens' systems pertained to black cemeteries. The lack of overlapping and disoriented graves tends to the conclusion that the cemetery was well kept and consciously organized. If there was a church associated with the cemetery, its site should show as a void, even though the structure itself may long have been gone. A 20 ft by 20 ft structure is a bare minimum, and most country churches are seldom smaller than 20 ft by 20 ft. The church, if it was built in the Lutheran or Anglican tradition, would be to the west of the oldest graves.

4. If these people were slaves, they should show in the raw census returns and the country assessment rolls. Since iron furnaces often employed slaves direct from Africa, one should expect the furnace workers to be pure negroid stock. It on the other hand they were free negroes or house servants, one should expect pure Christian traits in mimicry of the whites with whom they lives so intimately; and one should expect some white bloodlines, since admixture began quite early. House servants would not likely be new imports. There are articles on black plantation burial grounds in the deep south where grave offerings are found even today on top of graves and the grave yards are left unkempt and disorganized on purpose.

5. Grave offerings have been seen by some writers as modern survivals of pre-Christian practices, observed in South Carolina today. The lack of grave offerings indicates a rather thorough acculturated society. Rigid Christian burial practice indicates to me at least that these people were under the influence of an authoritarian church structure, probably with a white minister. The lack of tombstones or a wall around the yard is no identification in itself for this region. The Quakers did not begin marking graves until after the Revolution, and the wealthy Anglican Rodney family did not use tombstones in its family plot near here.

Edward F. Heite III
October 8, 1979

APPENDIX 9

Artifact Catalogue

Catactin Check # 6

18 FR 323

Catalog # 1 - surface collection, clearing brush (entire site)

5 animal bones
2 quartz flakes (removed for further analysis)

Catalog # 2 - surface collection, N 50-55/E 110-115

1 large horse shoe w/nails - either for snow and ice or therapeutic - machine cut nails

Catalog # 3 - surface collection, clearing brush (entire site)

1 animal bone

Catalog # 4 - surface collection, N 60-90/E 110-130

1 animal tooth
1 animal bone
2 sherds (1 whiteware, 1 annular pearlware)

Catalog # 5 - surface collection, N 40-50/E 150-155

1 animal mandible

Catalog # 6, Feature 2

7 machine cut, headless nails (6 treated, 1 not treated)
6 machine cut, machine head - L headed nails (5 treated, 1 not treated)
3 machine cut, machine head - T headed nails (2 treated, 1 not treated
2 machine cut (head?) - treated
18 nails total

3 shroud pins - cuprous
1 fibre sample w/pin
1 soil sample

Note: the fibres in these nails run length wise to shank
Date Range for nails: 1830 - 1900

Catalog # 7, Feature 1

22 machine cut, machine head - L headed nails (20 treated, 2 not treated)
1 hand wrought, rose headed nail (not treated)
23 nails total

1 soil sample
1 fibre sample
2 shroud pins (whole and fragments) cuprous

Note: the iron fibres in these nails run length wise to the shank
Date Range for nails: machine cut nails: 1830 - 1900
hand wrought nails: before 1790's

Catalog # 8 - surface collection, N 65/E 115

2 animal bones
2 animal teeth

Catalog # 9, Feature 3, top of coffin

3 hand wrought - T headed nails (2 treated, 1 not treated)
9 hand wrought - rose headed nails (4 treated, 5 not treated)
12 nails total

1 prehistoric pot sherd (removed for further analysis)
1 rhyolite biface (removed for further analysis
1 rhyolite flake (removed for further analysis
2 quartz flakes (removed for further analysis)

Date for nails is before 1790's

Catalog # 10, Feature 3, within coffin

26 hand wrought - rose headed nails (24 treated, 2 not treated)
6 hand wrought - T headed nails (4 treated, 2 not treated)
32 nails total

1 fibre sample w/cuprous pin
3 soil samples (1 cranial, 1 thoracic, 1 pelvic)

Date for nails is before 1790's

Catalog # 11, Feature 4

23 machine cut, hand headed nails from bottom of coffin (20 treated, 3 not treated
18 machine cut, hand headed nails (15 treated, 3 not treated)
3 machine cut, shouldered head nails
44 nails total

3 soil samples (1 cranial, 1 thoracic, 1 pelvic)
1 charcoal sample

Date Range for nails: 1790's - 1810. The date for the shouldered head nails less positive than rest, but could not exceed 1820

Catalog # 12, Feature 5

28 hand wrought - rose headed nails (25 treated, 3 not treated)

Date for nails is before 1790's

Catalog # 13 - surface collection, N 60-70/E 100-110

2 animal bones
1 small horse shoe w/cut nails

Catalog # 14, Feature 6

1 hand wrought - L headed nail (treated) - dating before 1790's
12 hand wrought - rose headed nails (treated) - dating before 1790's
12 machine cut, hand headed nails, burrs on 2 sides (treated) Date Range:1790's - 1810
13 unknown nails, hand headed (treated) Date Range: 1790's - 1820's
1 machine cut, machine head nail (possibly early stamped head, iron fibres length-wise to shank) Date Range early 1830's
1 machine cut, damaged head nail (iron fibres run cross-wise to shank, treated) Date Range:1790's - 1830
56 nails total

Date Range for nails: 1790's - 1830's, suggests use of misc. nails
T. antequem = 1830's

3 soil samples (1 cranial, 1 thoracic, 1 pelvic)
9 buttons (brass of varying sizes, all plain flat front, ring-eye back)
Ref. Noel Hume 1970 p. 91, types 7, 8, 9.

Catalog # 15, Feature 8

21 machine cut, machine headed nails (iron fibres run cross-wise to shank, 18 have burrs on 2 sides, 3 have burrs on one side only and have a date range between 1820-1830, 5 are not treated)
3 machine cut, hand head - T headed nails, treated (iron fibres run cross-wise to shank plus burrs on 2 sides)
10 machine cut, shouldered head nails (head seems machine made, but could be hand made) iron fibres run crosswise to shank and burrs are on two sides
1 machine cut, hand headed nail - treated
1 nail, probably wrought - not treated (before 1790's)
1 machine cut, early machine head nail - treated (iron fibres run cross-wise to shank)
38 nails total

3 soil samples (1 cranial, 1 thoracic, 1 pelvic)
4 buttons (2 brass, 2 white metal, flat front, ring eye back) Ref. Nel Hume 1970 p. 91, types 7, 8, 9

Date Ranges: machine cut machine headed nails made approx. ± 1820
machine cut, hand headed - T headed nails:1790 - 1810 (possibly as late as 1820)
machine cut, shouldered head - if machine headed:1820 - 1830
if hand headed :1790 - 1820
machine cut, hand headed nails:1790's - 1820
machine cut, early machine headed nails: 1815 - 1830's

Catalog # 16, Feature 7

41 hand wrought, L headed nails (35 treated, 6 not treated)
6 machine cut, hand headed nails (treated)
2 probable hand wrought, but possible cut nail, hand headed (not treated)
49 nails total

3 soil samples (1 cranial, 1 thoracic, 1 pelvic)

Date Range for nails: 1790's - 1820

Catalog # 17, Feature 10

21 machine cut, machine head - L headed nails (18 treated, 3 not treated)
4 screws, machine made, blunt point (treated)
6 machine cut, machine head - modern square headed nails
2 machine cut, early machine head nails
3 machine cut, headless nails (treated)
7 unidentified cut nails (not treated)
1 unidentified hand headed nail (not treated)
1 sample of wood w/nail
41 nails total

1 ceramic fragment (whiteware)
1 human pedal bone
3 soil samples (1 cranial, 1 thoracic, 1 pelvic)
7 buttons(1.6 cm in diameter) flat, 5-holed. (Ref. Noel Hume 1970, p. 91)
Similar to types 19 or 20.

Date Ranges: buttons ± 1820
machine cut, machine head - L headed nails
treated: 1820 - 1830
not treated: 1820 - 1900
screws: 1800 - 1843
machine cut, machine head - modern square headed: 1820 - 1900
machine cut, early machine head: 1815 - 1830's
machine cut, headless: 1820 - 1900
unidentified, hand headed nail: 1790's - 1820

Catalog # 18 - exploratory trench, N 70-80/E 137-140

1 animal bone

Catalog # 19, Feature 9

36 hand wrought, rose headed nails (30 treated, 6 not treated)
1 hand wrought, L headed nail (treated)
37 nails total

3 soil samples (1 cranial, 1 thoracic, 1 pelvic)
1 seed
1 bone fragment from grave fill above coffin level

Date Range for nails is before 1790's

Catalog # 20 - surface collection, N 60-65/E140-150

1 animal bone

Catalog # 21, Feature 11

4 hand wrought nails (treated)
35 machine cut, hand headed nails (28 treated, 7 not treated)
2 machine cut, modern machine head (treated)
41 nails total

3 pins (cuprous) Date Range: 1790 - 1820

Catalog # 22 - surface collection, N 40/ E 155

1 bifacially worked quartz flake (removed for further analysis)

Catalog # 23, Feature 12

23 machine cut, machine headed nails (13 treated, 10 not treated)
5 screws, blunt point (washed)

1 shroud pin, cuprous
3 soil samples (1 cranial, 1 thoracic, 1 pelvic)

Date Range: nails 1820 - 1900
screws 1800 - 1843

Catalog # 24, Feature 13

49 machine cut, machine head - L headed nails (45 treated, 4 not treated)
2 machine cut, hand headed nails
51 nails total

3 screws - round heads, blunt point
3 soil samples (1 cranial, 1 thoracic, 1 pelvic)
2 buttons, shell (1.1 cmm diameter) flat, 4 hole (Ref. Noel Hume, 1970, P.91). type 22)
1 human bone, small
1 slag fragment

Date Ranges: machine cut, machine head - L headed nails: 1820 - 1830
machine cut, hand headed nails: 1790's - 1820
screws: like of type 1800 - 1846

Catalog # 25 - surface collection, N 55-65/E 140-145

2 animal bones
2 pieces of cut wood

Catalog # 26, Feature 14

28 machine cut, machine headed nails (20 washed, 8 not washed)
2 screws, blunt point

soil samples and wood samples

Date Range: nails 1820 - 1900
screws 1800 - 1843

Catalog # 26, Feature 14 (disturbed)

1 clear glass 20th century, screw top, embossed bottom
1 bag of rodent skull fragments

Catalog # 27 - surface collection, N 60-65/E 95-100

1 rhyolite flake (removed for analysis)

Catalog # 28 - disturbed soil 4.0' BS. N 60-65/E 90-100

1 machine cut, machine headed nail

Date Range: 1820 - 1900

Catalog # 29 - surface collection, N 65/E 96

1 whiteware sherd

Catalog # 30 - fill above Feature 18

1 quartz flake (removed for further analysis)

Catalog # 31, Feature 16

39 hand wrought, rose headed nails (30 treated, 9 not treated)
5 hand wrought T headed nails (treated)
44 nails total

1 bag of wood samples
1 sample of plant remains (rodent disturbance)
3 soil samples (1 cranial, 1 thoracic, 1 pelvic)

Date Range of nails is before 1790's

Catalog # 32, Feature 18

22 hand wrought, rose headed nails (18 treated, 4 not treated)

1 container: 2 shroud pins and fibre sample from under cranium
3 soil samples (1 cranial, 1 thoracic, 1 pelvic)

Catalog # 33, Feature 15

51 hand wrought, rose headed nails (40 washed, 11 not washed)
7 hand wrought, T headed nails (6 washed, 11 not washed)
58 nails total

1 sample of wood fragments from top of coffin
1 sample of seeds
4 soil samples (1 cranial, 1 thoracic, 1 pelvic, 1 from area w/seeds over tibial area of coffin
1 rhyolite flake (removed for further analysis)

Catalog # 34, Feature 19

43 machine cut, machine headed nails (32 washed, 11 not washed)

Date Range: 1820 - 1900

Catalog # 35, Feature 21

1 hand wrought, rose headed nail (washed)
1 soil sample (cranial)
1 sample of flower seeds from west of cranial area

Date for nail is before 1790's

Catalog # 36, Feature 17

from feature

13 machine cut, machine headed nails (4 washed, 9 not washed)

Date Range: 1820 - 1900

from sifter

15 machine cut, machine headed nails (4 washed, 11 not washed)

Date Range: 1820 - 1900

from disturbed soil

6 hand wrought, rose headed nails (4 washed, 2 not washed)

Date for nails is before 1790's

3 soil samples (1 cranial, 1 thoracic, 1 pelvic). Firm date range for burial: 1820+

Catalog # 37 - exploratory trench, N 75-90/E 97.5-102.5

6 animal bones

Catalog # 38, Feature 23

30 hand wrought, rose headed nails (6 washed, 24 not washed)
3 soil samples (1 cranial, 1 thoracic, 1 pelvic)

Date for nails is before 1790's

Catalog # 39, Feature 22

28 hand wrought, rose headed nails (4 washed, 24 not washed)
1 hand wrought, T headed nail (washed)
29 nails total

1 quartz scraper (removed for further analysis)
4 soil samples (1 cranial, 1 thoracic, 1 pelvic, and pollen sample from toe of coffin)
1 seed sample from top of coffin, east-end

Date Range for nails is before 1790's

Catalog # 40 - surface collection, N 60/E 80

1 brown lead glazed redware rimsherd
1 ferrous piece of barb wire (type unknown)

Catalog # 41 - surface collection, N 45-50/E 110-115

1 rhyolite biface fragment (removed for further analysis)

Catalog # 42 - exploratory trench, N 50-55/E 60-70

1 piece of slag

Catalog # 43, Feature 20

16 machine cut, machine headed nails (6 washed, 10 not washed)
2 machine cut, hand headed nails (1 washed, 1 not washed)
18 nails total

2 soil samples (cranial, post cranial)
1 shroud pin (cuprous)

Date Range: machine cut, machine headed nails: 1820 - 1900
machine cut, hand headed nails: 1790 - 1820

Catalog # 44, Feature 25

17 hand wrought, rose headed nails (8 washed, 9 not washed)
1 wood sample

Date for nails is before 1790's

Catalog # 45, Feature 24

14 hand wrought, rose headed nails (3 washed, 11 not washed)
3 soil samples (1 cranial, 1 thoracic, 1 pelvic)

Date for nails is before 1790's

Catalog # 46, Feature 26

31 machine cut, hand headed nails (burr on 2 sides; 6 washed, 25 not washed)
3 soil samples (1 cranial, 1 thoracic, 1 pelvic)
1 peach pit

Date Range for nails: 1790's - 1810

Catalog # 47, Feature 29

4 machine cut, machine headed nails, T-headed
1 machine cut, machine headed nails, no head
7 machine cut, machine headed nails, L-headed
12 nails total

Date for nails is 1820 or later

1 cuprous pin w/ fibre
2 soil samples (cranial, post cranial)

Catalog # 48, Feature 28

18 machine cut, machine headed nails, L-headed

Date for nails is 1820 or later

5 brass pins
1 lithic flake
2 soil samples (cranial, post cranial)

Catalog # 49, Feature 30

23 hand wrought, rose headed nails

Date for nails is before 1790

1 seed sample

Catalog # 50, surface collection from machine disturbed soil ± W85/E100

1 spike

Catalog # 51, Feature 32

16 hand wrought, rose headed nails
1 hand wrought, no headed nails
17 nails total

1 bag of rodent skeletal remains

3 soil samples (cranial, thoracic, pelvic)

Catalog # 52, Feature 33

16 hand wrought, rose headed nails
2 hand wrought, T-headed nails
1 hand wrought, no headed nails
19 nails total

Date for nails is before 1790

3 soil samples (cranial, thoracic, pelvic)

Catalog # 53, Feature 34

9 machine cut, machine headed nails, L-headed:1820
2 hand wrought, rose headed nails:prior to 1790
11 nails total

4 cuprous pins
1 sample of wood
2 soil samples (cranial, post cranial)

Catalog # 54, surface collection N35-90/E170-270

1 piece of slag
3 brick fragments
1 piece of metal
1 metal animal trap
4 pieces of ceramic

Catalog # 55, Feature 35

18 hand wrought nail fragments
5 hand wrought, no headed nails
7 hand wrought, L-headed nails
9 hand wrought, T-headed nails
8 hand wrought, rose headed nails
47 nails total

Date for nails is prior to 1/90

3 cuprous pins and 1 fragment
1 ferrous bar with wood from pedal area
1 ferrous bar from pelvic area
1 ferrous right angled bar from area of left patellae
1 ferrous bar from cranial area
3 soil samples (cranial, thoracic, pelvic)

Catalog # 56, from back fill area of Feature 3

1 nail

APPENDIX 10

Qualifications of Investigators

RESUME

Ronald A. Thomas
5533 Limeric Circle
Wilmington, DE 19808
302/737-3288 368-5777

Birth Date: 11/14/40
Married/2 Children
SS # 165-32-2948
S.O.P.A.

EDUCATION:

Uniontown (PA) High School	1958	Academic
Pennsylvania State University	1962	B.A. Anthropology
University of Arkansas	1969	M.A. Anthropology
University of Pittsburgh	1964	Ph-D Candidate
Temple University	1977 - Present	Ph-D Candidate

EXPERIENCE:

1960 - 1961	Field Crew - Sheep Rock Shelter, Pennsylvania Historical and Museum Commission
1962 - 1964	Research Assistant, University of Arkansas Museum
1964	Teaching Fellow, University of Pittsburgh
1965 - 1977	State Archaeologist, Delaware Archaeological Board and Division of Historical & Cultural Affairs
1967 - 1977	Instructor in Anthropology, University of Delaware
1976 - 1977	Executive Officer & Principal Investigator, for Delmarva Clearinghouse for Archaeology
1977 -	President & Principal Investigator for Mid-Atlantic Archaeological Research, Inc.
1978 -	Archaeologist, for DeLeuw, Cather/Parsons on continuing Northeast Corridor (Amtrak) Improvement Project
1978 -	Adjunct Assistant Professor, University of Delaware

POSITIONS & AFFILIATIONS

Eastern States Archeological Federation	1969-74	Recording Secretary
	1976-78	President
Society for American Archaeology		Committee for Public Archaeology
		Committee on Employment
Middle Atlantic Arch. Conference	Editor	1972-73
Society of Professional Archaeologists	Member	1977-78
Delaware Review Board - National Register	Member	1977-78
Archaeological Society of Delaware	Editor	1978

Advisory Committees (Delaware)
- State Comprehensive Outdoor Recreation Plan
- Subdivision Advisory Committee - New Castle County
- " " - Kent County
- Federal Aid Review Committee (FARC)

Delaware Academy of Science Member

RESEARCH INTERESTS:

Cultural Resource Management - experience as State Archaeologist in program developed by writer to conduct reviews of all construction projects within State. Continued interest as member of State Review Board for the National Register Program and as Principal Investigator on over twenty projects for Mid-Atlantic Archaeological Research, Inc. Serves as Delaware representative to SAA Committee on Public Archaeology and is a member of the American Society for Conservation Archaeology. Has been a member of the Society of Professional Archaeologists since its inception and is registered in six categories.

Environmental Archaeology - coordinated a major publication on the prehistoric subsistence/settlement patterns of the Delmarva Peninsula and has been involved in environmental studies of Middle Atlantic prehistoric populations.

Historic Sites Archaeology - excavated a large number of colonial American sites in four States and has prepared reports on same. Among these projects were domestic sites, industrial sites and military sites.

Prehistoric Trade - conducted original research into trade and communications among Middle Woodland and Early Woodland peoples of the Atlantic Seaboard. Authored several reports on this research and will use similiar data as a research topic for Doctoral discertation at Temple University.

Mortuary Practices - excavated a major Amerind prehistoric cemetery in State of Delaware (Island Field Site) and authored reports on the mortuary practices of the sociocultural group involved.

Lithic Technology - conducted distribution study of lithic materials used and traded by prehistoric peoples of eastern United States and Canada. Supervised research into the "fingerprinting" of lithic sources for detailed identification purposes (using atomic absorption analysis). Founded and edited publication on lithic sources (Lithic Source Notebook).

PUBLICATIONS:

1963 "Prall Shelter (3BE187)" Bulletin of the Arkansas Archeological Society, Vol. IV, No. 10, pp. 3-5 Fayetteville

1963 "Projectile Point Sequence at Breckenridge Shelter" Bulletin of the Arkansas Archeological Society, Vol. III, No. 10, pp. 1-3

1963 "3LR49: An Open Site in Southwest Arkansas" Bulletin of the Arkansas Archeological Society, Vol. IV, No. 10, pp. 12-14

1963 "Archaeological Investigations at the Keenon Farm" (ms.)

1965 Delaware Archaeology, Vol. 1, No. 1 EDITOR

1966 "Excavations at Prall Shelter (3BE187) in Beaver Reservoir, Northwest Arkansas" Bulletin of the Arkansas Archeological Society, Vol. VII, No. 4, with Hester A. Davis

1966 Delaware Archaeology, Vol. 2, No. 1 - 4 EDITOR

1966 "The Delaware Archaeological Board Site Survey: A Progress Report" Delaware Archaeology, Vol. 2, No. 1, pp. 2-14

1966 "7NC-F-7, the Hell Island Site" Delaware Archaeology, Vol. 2, No. 2,

1966 "Paleo-Indian in Delaware" Delaware Archaeology, Vol. 2, No. 3

1966 "Archaeological Investigations on Milford Neck" Delaware Archaeology, Vol. 2, No. 4, with Cara Lewis

1967 "Archaeology in Delaware" Delaware Archaeological Board, 4 pp.

1968 "Hunters and Fishermen of Prehistoric Delaware" Delaware Conservationist, Vol. XII, No. 3

1969 "Archaeology in Delaware" Department of Public Instruction Pupil Guide, EDITOR

1970 "The Island Field - A Prehistoric Village and Cemetery" Delaware Archaeological Board, 19 page handout

1970 "Adena Influence in the Middle Atlantic Coast" Adena: The Seeking of an Identity, Ball State University, B.K.Swartz, EDITOR

1970 "1970 Salvage Excavations at the Mispillion Site" The Archeolog, Vol. XXII, No. 2, with Nancy H. Warren

1970 "A Middle Woodland Cemetery in Central Delaware: Excavations at the Island Field Site" Bulletin of the Archaeological Society of Delaware, No. 8 NS with Nancy H. Warren

1972 Proceedings of the Third Annual Middle Atlantic Archaeological Conference, EDITOR

1972 "Dorothy Cross Jenzen: An Obituary" Man in the Northeast, Vol. 4,

1973 "Two Small Stone Effigies from Cecil County, Maryland" Maryland Archeology, Archeological Society of Maryland

1973 "Cached Blades from a Millsboro Site" The Archeolog, Vol. XXV, No. 1,

1973 Proceedings of the Fourth Annual Middle Atlantic Archaeological Conference, EDITOR

1973 "Prehistoric Mortuary Complexes of the Delmarva Peninsula" Proceedings of the 4th Annual MAAC,

1974 "Hunters and Gatherers Were Eating Well Long Before Supermarkets" Delaware Conservationist, Vol. XVIII, No. 2, with Daniel Griffith

1974 "A Brief Survey of Prehistoric Man on the Delmarva Peninsula" Transactions of the Delaware Academy of Science, Vol. 5/6

1974 "Webb Phase Mortuary Customs at the Island Field" Transactions of the Delaware Academy of Science, Vol. 5/6

1974 "A Discussion of the Lithics, Ceramics, and Cultural Ecology of the Fox Creek-Selby Bay Paradigm as it Applies to the Delmarva Peninsula" paper given at the 5th Annual MAAC, with Daniel Griffith, Cara L. Wise & Richard E. Artusy, Jr. (to be published)

1975 Lithic Source Notebook EDITOR

1975 "Environmental Adaptation on Delaware's Coastal Plain" Archaeology Of Eastern North America, Vol. 3 with Daniel R. Griffith, Cara L. Wise and Richard E. Artusy, Jr.

1975 "A Survey of Historic Sites Archaeology in the Delmarva Peninsula" Transactions of the Delaware Academy of Science,

1976 "Early Man at Holly Oak, Delaware" Science, Vol. 192, No. 4241 with John C. Kraft

1976 "A Re-evaluation of the St. Jones River Site" Archaeology of Eastern North America, Vol. 4,

Cultural Resource Reports:

Delaware

1976 A Cultural Resource Reconnaissance Survey at Island Creek Sussex County, Delaware, Delmarva Power & Light Co., Wilmington, Delaware

1977 Archaeological Excavations at the Kent County Administration Building Project, Division of Historical and Cultural Affairs, Dover, Delaware

1977 An Archaeological Reconnaissance of the Fenwick Island Sanitary Sewer District, Sussex County Council, Georgetown, Delaware

1977 A Cultural Resource Survey of the John M. Lecato Regional Wastewater Facilities, Sussex County Council, Georgetown, Delaware

1980 A Cultural Resources Assessment Concord Pike, New Castle County, Delaware, Department of Transportation, Delaware

1980 Archaeological Investigations at South Wilmington Boulevard, Wilmington, Delaware, Department of Transportation, Delaware

1980 Routes 4, 7, & 273: An Archaeological Survey, A Location and Identification Survey of Delaware DOT Projects Along Routes 4, 7, & 273, New Castle County, Delaware, Department of Transportation, Dover, Delaware

1980 Archaeological Investigations at the Delaware Park Site, Delaware Department of Transportation, Dover, Delaware

Maryland

1976 A Cultural Resources Reconnaissance of the Rhodes Point to Tylerton Federal Maintenance Dredging Project, Smith Island, Somerset County, Maryland, The Baltimore District, Corps of Engineers, Baltimore, Maryland

1977 A Report on a Preliminary Archaeological Survey at the Church Hill Sewerage System, Church Hill, Maryland, The Commissioners of Church Hill, Church Hill, Maryland

1977 A Cultural Resource Survey of the U.S. Route 50 Vienna Improvements Highway Project, DeLeuw Cather & Company, Washington, D.C.

1977 Archaeological Investigations at the McCain Loop Transmission Line Site, Allegheny Power Service Corporation, Greensburg, Pennsylvania

1977 Archaeological Excavations at the Molloy House, Chestertown, Maryland, Maryland Historical Trust, Annapolis, Maryland

1977 Archaeological Investigations at the Susquehanna Museum of Havre De Grace, Maryland, Susquehanna Museum, Havre De Grace, Maryland

1977 A Report on a Cultural Reconnaissance of the Fishing Bay and Pocomoke River Dredged Material Disposal Sites on the Eastern Shore of Maryland, U.S. Corps of Engineers, Baltimore, Maryland

1978 A Cultural Resources Reconnaissance for the Wicomico River (East) Federal Maintenance Dredging Project, Corps of Engineers, Baltimore, Maryland

1978 Cultural Resources Survey Northeast River Sewerage Facilities, Cecil County, Maryland, Cecil County Commissioners, Elkton, Maryland

1979 An Archaeological Reconnaissance of a DP & L Transmission Line: Bishop to Ocean City, Worcester County, Maryland, Delmarva Power & Light Co., Salisbury, Maryland

1979 Archaeological Investigations at the North Stairs Hampton National Historic Site, Towson, Maryland, Denver Service Center, National Park Service, Denver, Colorado

1980 An Archaeological Survey at College Park Airport, Prince Georges County, Maryland, Wallace, Roberts and Todd, Inc., Philadelphia, Pennsylvania

1980 Archaeological Investigations at Catoctin Furnace, Frederick County, Maryland, Orr and Son, Thurmont, Maryland

1980 Archaeological Investigations at the Federal Reserve Bank Site, Baltimore, Maryland, Maryland Historical Trust, Annapolis, Maryland

1980 The Hollingsworth Farm Site Archaeological Survey Phase II Final Report, Cecil County, Maryland, Cecil County Commissioners, Elkton, Maryland

New Jersey

1978 A Cultural Resources Survey at the Great Swamp National Wildlife Refuge, New Jersey, Heritage Conservation and Recreation Service, Interagency Archeological Services-Atlanta

1979 An Archaeological Survey of Four State of New Jersey Department of Transportation Highway Projects: M--4036 (101), RS--172 (101), RS--172 (101), and RS--22 (004), Gloucester County, New Jersey, New Jersey Department of Transportation, Trenton, New Jersey

1980 A Cultural Resources Survey: Route 147 Cape May County, New Jersey, DiLullo, Clauss, Ostroski, and Partners, Bridgewater, New Jersey

Pennsylvania

1977 A Cultural Resource Survey of the Delcora Sewer Force Main Project, Betz Environmental Engineering, Plymouth Meeting, Pennsylvania

1977 An Assessment of the Archaeological Potential and Needs of State-Owned Historic Sites and Museums of the Pennsylvania Historical and Museum Commission, Bureau of Historic Sites and Properties, William Penn Memorial Museum, Harrisburg, Pennsylvania

1978 An Archaeological Reconnaissance of the Transco Energy Co., Delaware County-Pennsylvania Project Area, Arliss D. Ray, Ph-D, Houston, Texas

1978 An Archaeological Survey of Designated Portions of the Proposed Warwick Township Wastewater Facility, Glace and Glace, Inc. Consulting Engineers, Harrisburg, Pennsylvania

1979 Archaeological Data Recovery Operations at the Morton Homestead, Pennsylvania, Betz Environmental Engineers, Plymouth Meeting, Pennsylvania

North Carolina

1979 A Cultural Resource Survey at Swanquarter National Wildlife Refuge, Interagency Archeological Services-Atlanta

Virginia

1979 A Cultural Resources Survey at Chincoteague National Wildlife Refuge, Virginia, Interagency Archeological Services-Atlanta

1979 An Archaeological Survey of the Chatham Manor Tract Fredericksburg-Spotsylvania National Historic Park, Fredericksburg, Virginia, National Park Service, Denver Service Center, Denver, Colorado

1979 Cultural Resources Reconnaissance Investigations for the Metropolitan Washington Area Water Supply Study, Corps of Engineers, Planning Division, Baltimore, Maryland

CONTRACT REPORTS

Delaware

1977	Kent County Administration Building	Salvage Report
1977	Fenwick Island Force Main ROW	Archaeological Survey
1977	LeCato Wastewater Disposal Site	Cultural Resources Survey
1976	Island Creek Solid Waste Disposal Site	Archaeological Survey
1979	Delaware Route 4/7/273 Improvement Survey	Cultural Resources Survey
1979	Delaware Route 202 Improvement Project	Cultural Resources Survey
1979	South Wilmington Boulevard	Cultural Resources Survey

Maryland

1977	McCain Loop Power Pole Siting	Salvage Report
1977	Church Hill Force Main	Cultural Resources Survey
1977	Northeast Force Main	Cultural Resources Survey
1977	Molloy House	Excavation Report
1978	Vienna Route 50	Archaeological Survey
1978	Susquehanna Museum	Excavation Report
1978	Fishing Bay Dredging	Cultural Resources Survey
1978	Rhodes Point to Tylerton Dredging	Cultural Resources Survey
1978	Wicomico River Dredging	Cultural Resources Survey
1979	Bishop to Ocean City Power Line	Cultural Resources Survey
1979	Hampton Mansion	Excavation Report
1980	Catoctin Furnace Projects	Excavation Reports

New Jersey

1978	Great Swamp N. W. R.	Cultural Resources Survey
1979	Gloucester Highways Improvements	Cultural Resources Survey
1978	Lionshead South	Cultural Resources Survey
1977	Salem City Building	Salvage Report
1979	Thousand Oaks	Cultural Resources Survey
1979	Brigantine N.W.R.	Cultural Resources Survey
1978	Metedeconk Estates	Cultural Resources Survey
1978	Seven Presidents Park	Cultural Resources Survey
1980	Grimes Homestead	Cultural Resources Survey

Pennsylvania

1977	Delcora Force Main Project	Archaeological Survey
1977	Pennsylvania Historical Museum Assessment	Archaeological Evaluation
1978	Morton Homestead	Excavation Report
1978	Transco Industrial Site	Cultural Resources Survey
1979	Warwick Force Main	Archaeological Survey

Virginia

1979	Metropolitan Washington Water Study	Cultural Resources Survey
1979	Chatham Manor Study	Cultural Resources Survey
1980	Chincoteague N.W.R.	Cultural Resources Survey

Sharon Ann Burnston
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Philadelphia, Pennsylvania 19131
(215) 477-1555

Education

1973 - present — Doctoral Candidate, Temple University Department of Anthropology

1978 — Master's Degree completed, Temple University Department of Anthropology

1967 — Bachelor of Arts Degree, Brooklyn College, magna cum laude with honors in anthropology

Research Interests

Coursework:
- Theory and Methods of Archaeology
- Social and Economic History of American Colonial Period
- Historic Research Methods
- Economic Anthropology
- Processes of Culture Change
- Bio-Cultural Adaptation
- Urban Anthropology
- Historic Sites Archaeology
- Northeastern Prehistory
- American Vernacular Architecture

Research Topics:
- The Nature of Archaeological Inference
- Theory and Method of Historic Sites Faunal Analysis
- History of Husbandry (especially post-medieval)
- History of Material Culture (especially dress, food, furnishings, toys)
- History of Technology
- Social History (especially Anglo-American colonies)
- Demographic Reconstruction

Papers:

"Human Infant Remains from an Eighteenth Century Philadelphia Trash Deposit"
- -M. A. Thesis 1978
- -condensed version read at annual meetings, Society for Historic Archaeology, 1977

"Animal Bones and the Social System--Man-Animal Relationships in Colonial Philadelphia"
- -read at annual meetings, Society for Historic Archaeology, 1976

"American Colonial Animal Husbandry as Man-Animal Relationships"
- - unpublished paper, 1974

"Occupational Dress as a Key to Status and Interaction Among Eighteenth Century Urban Groups"
- -unpublished paper, 1980

"Burial Practices at Catoctin Furnace Slave Cemetery"
- -in progress

Archaeological Field Work

August 1979 - current	Catoctin Cemetery Archaeological Project, Field Supervisor
June-July 1979	South Wilmington Boulevard Project
July 1974 - June 1975	Independence Hall Sidewalk Salvage Project, Assistant Field Supervisor
January 1973 - December 1974	Head House East Project, Assistant Field Supervisor
January 1972 - April 1973	Franklin Court IV Project
September 1971 - January 1972	Blue Anchor Tavern Site

Historic Documentation

July-August 1977	John M. LeCato Regional Wastewater Facilities Archaeological Survey, Researcher
June 1975 - August 1976	Tennessee Valley Authority Indian Research Project, Research Assistant

Osteological Analysis

August 1979 - current	Catoctin Cemetery Archaeological Project, Field Analyst, human skeletal remains
August 1977 - May 1978	George Washington Birthplace Excavations, Faunal Analyst
October-November 1976	Dr. Thomas Williams Privy Project, Historic Deerfield, Faunal Analyst
August 1975	Fort Putnam Redoubt IV Project, Faunal Analyst
June 1975	Independence National Historic Park Collections Analysis Project, Faunal Analyst
October 1975 - December 1976	Head House East Project, Analyst and Documentation Researcher, human skeletal remains
October 1974 - December 1975	Head House East Project, Faunal Analyst
April 1972 - October 1973	Franklin Court IV Project, Faunal Analyst

Other

current	Volunteer Costume Consultant, Colonial Plantation, Ridley Creek State Park
June 1976	Costume Consultant, Dr. Thomas Wynne House Bicentennial Events

January-February 1976 Costume Consultant, Ebenezer Maxwell Mansion

1964 - 1968 Participation as Student or Staff in Archaeological Field Schools in Arizona, Israel, State of Washington, New York State

Honors and Awards

Graduate Fellow, Temple University, 1974-1978

Phi Beta Kappa, elected 1967

Society of the Sigma Xi, elected 1967

Brooklyn College Faculty Women's Fellow, 1967

Professional Memberships

Society for Historic Archaeology