

INDIANA ARCHAEOLOGY

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Indiana Department of Natural Resources
Division of Historic Preservation
and Archaeology (DHPA)

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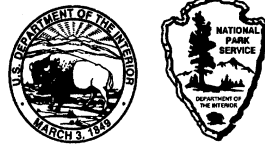
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Mission Statement: *The Division of Historic Preservation and Archaeology promotes the conservation of Indiana's cultural resources through public education efforts, financial incentives including several grant and tax credit programs, and the administration of state and federally mandated legislation.*

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INTRODUCTION

Per state statute (Indiana Code 14-21-1-12), one of the duties of the Division of Historic Preservation and Archaeology (DHPA) is to develop a program of archaeological research and development, including the publication of information regarding archaeological resources in the state. This journal is one of the ways the DHPA addresses that mandate. Also, Indiana Code 14-21-1-13 states that the Division may conduct a program of education in archaeology. Indiana's cultural resources management plans have also listed educating the public about Indiana's prehistoric and historic Native American cultures and identifying, and studying Native American, African-American, and other ethnic and cultural heritage resources, as ways to accomplish several preservation goals. The variety of archaeological sites in Indiana is wide-ranging and impressive. Virtually all of the cultural groups prehistorically and historically in Indiana are represented archaeologically in one way or another.

We are pleased to offer this digital document containing articles on a broad range of archaeological and anthropological topics. Archaeology is happening regularly in Indiana, and all of these articles provide the reader with various insights into many important sites, theories, and projects. To view previous volumes of *Indiana Archaeology*, go to <http://www.in.gov/dnr/historic/3676.htm>.

For those who may not be familiar with some archaeological terms, a helpful glossary of some of these general terms is included in the back of this journal. To also aid the non-archaeologist reader, a general overview of prehistoric time periods may be found at the end of this volume. Additional archaeological outreach documents, including *Early Peoples of Indiana*, may be accessed at www.IN.gov/dnr/historic. For those readers who may not be familiar with the authors and editors of the volume, biographical information is provided. Feel free to access our Indiana archaeological travel itinerary (<http://www.in.gov/dnr/historic/files/travelsarchaeo.pdf>) if you would wish to visit an archaeological site. The DHPA also urges you to participate in the annual Indiana Archaeology Month in September. If you have an interest in providing a voluntary financial donation to contribute to archaeology in our state, please consider the Archeology Preservation Trust Fund (<http://www.in.gov/dnr/historic/5897.htm>).

-- JRJ, ALJ

To archaeologists, the human past is owned by no one. It represents the cultural heritage of everyone who has ever lived on Earth or will live on it in the future. Archaeology puts all human societies on an equal footing.

Introduction to *The Oxford Companion to Archaeology*, Oxford University Press, New York. 1996. Edited by Brian M. Fagan

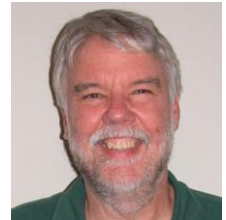
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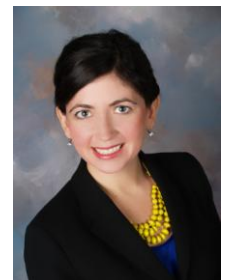
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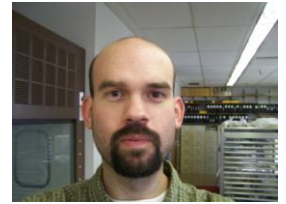


Maas, Anna– Ms. Maas received her Bachelor of Architectural History, Master of Urban and Environmental Planning, and Certificate in Historic Preservation at the University of Virginia, School of Architecture, concentrating on nineteenth- and twentieth-century high-style and vernacular American architecture. She has over 12 years of experience in Cultural Resource Management and Preservation Planning in the Midwest, Middle Atlantic, Northeast, and Southeast. At Corn Island Archaeology, she serves as the principal investigator and project manager on all historic properties investigations, including Section 106 compliance

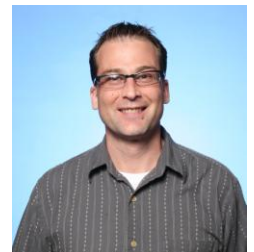


projects, National Register nominations, and HABS/HAER documentation. Her expertise contributes to archaeological investigations, landscape master plans, cultural histories, and management plans. In addition to research, fieldwork, and reporting, she is responsible for proposals and budgeting, project planning and management, and oversight of support staff. She also assists in marketing. Devoted to historic preservation education, Ms. Maas is a past board member of the Louisville Historical League and currently serves on the boards of Preservation Kentucky and Preservation Action based in Washington, D.C. Research interests include the history of transportation, land use, and development as well as twentieth- and twenty-first-century design worldwide.

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USING TREE-RING GROWTH PATTERNS TO IDENTIFY THE DATE OF CONSTRUCTION OF COMMUNITY HOUSE NO. 2, NEW HARMONY, INDIANA

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Introduction

In 1814 Father George Rapp and approximately 1,000 followers established the town of Harmony, Indiana in the frontier wilderness of the Wabash River Valley. The millenarian group was known for communal living, hard work, and celibacy and migrated to the seclusion of the Indiana Territory to await Jesus Christ's Second Coming. Harmony, where Rapp and his followers resided for ten years, was the second of three American towns the group constructed after leaving the German Duchy of Württemberg in 1803. The group had outgrown the hastily created town of Harmony, Pennsylvania in 1804 (Taylor 1987:16). Desiring more space and greater isolation, Rapp chose the Wabash River location of New Harmony for its access to New Orleans markets to support their industry. The Harmonists laid out their town on a grid and constructed two churches, and several substantial industrial and agricultural structures (for instance a granary, brewery, and rope-making factory). The landscape surrounding the town was laid out in agricultural fields and vineyards, and the community became wealthy selling their goods. When the region filled with non-Harmonist settlers, the group chose to isolate itself again by moving back to western Pennsylvania, and they created the town of Economy in 1824. Rapp sold Harmony, Indiana to Welsh industrialist Robert Owen who attempted to establish a utopian community. However, this experiment failed after only a few years, and the town was sold to individual property owners where it has evolved as a typical rural Hoosier community (Arndt 1965; CHP 2007; Taylor 1987).

One of the Harmonist's undertakings was the construction of four community houses for its members. These buildings served as dormitories and included two to three stories of bedroom, kitchen, and assembly spaces. They were located throughout the center of the town, and included animal stables and garden spaces. The purpose of this article is to report the use of tree-rings to date the construction of Harmonist Community House No. 2 (Figure 1). The building is owned by the Indiana State Museum and Historic Sites (ISMHS) and is one of two Harmonist community houses interpreted by the agency (Community House No. 4 is interpreted as an opera house). ISMHS recently commissioned a Historic Structures Report (HSR) for the building (CHP 2007) to guide preservation decisions. In the summer of 2012, wood core samples were taken from timbers located in the dwelling's third floor and attic spaces. Although the sample locations represent a small percentage of the entire structure, the study confirms conclusions made in the HSR. More importantly, the study provides additional information about the dwelling, and clarified questions about modifications to the structure.

This article reports the first known use of dendroarchaeology (application of tree-ring techniques for the dating of historically erected buildings) to date the construction and modification of buildings in New Harmony. Knowing these dates help preservationists make informed management and interpretive decisions. For the authors, who work closely with local museums and individuals interpreting historic structures in public history, public schools, and university settings, the dendroarchaeology of historic structures is approached within a framework of interpretive archaeology (Baas and Rubino 2012, 2013; Rubino and Hanson 2009; Wilkie 2009).



Figure 1. Community House No. 2 in 1940 (Library of Congress, Prints & Photographs Division, HABS IND, 65-NEHAR, 2-1).

Historic Context for Community House No. 2

Ball State University's Center for Historic Preservation completed a Historic Structure Report (HSR) for Community House No. 2 in 2007. The HSR describes how Harmonists constructed four community houses throughout the center of the small town. Community House No. 2 was finished in 1822, and housed 50 Harmonists on the first two stories. Rapp chose not to finish the third story in bedrooms because he believed there would be too many residents in the structure for the kitchen to support. Therefore, the subsequent two community houses were constructed smaller (CHP 2007:55).

Following the Harmonist's departure for Economy, Pennsylvania in 1824, Community House No. 2 became property of Robert Owen when he purchased the town in 1824. Owen used the structure as a school, a Masonic Hall, and as apartments. In 1828, the structure became property of William Maclure (a philanthropist partner of Owen) as part of a complicated settlement of the community's debt following the failure of Owen's experiment. The community house continued to be used for education, and it passed to Maclure's descendants following his death in 1840. Beginning in 1856, under a variety of different owners, the building housed such

commercial uses as a tavern, grocery store, newspaper publishing, and continued to be used as apartments (CHP 2007:56, 63, 68).

Historic American Building Survey (HABS) documentation was completed for the structure in 1933 (Figures 3 and 4). It was sold to the State of Indiana in 1940 then underwent a major restoration in the 1950s and several minor restorations over the ensuing decades. The house was listed in the National Register of Historic Places in 1966 as part of the New Harmony Historic District (CHP 2007:274). Recent renovations added elevator access to all three stories, office space, and a new HVAC system.

Harmonist Construction Techniques

Community House No. 2 is a rectangular (82 feet x 45 feet), three-story dwelling with a mansard roof. It is oriented north and south, with the long facade of the building facing west onto Main Street (Figures 2 and 3). The Harmonists constructed the dwelling with the east facade as the primary facade and entrance. However, the Main Street facade became the building's "front" for periods of the 19th and 20th centuries.

The dwelling demonstrates two types of construction. The exterior walls are brick and are instrumental in bearing the weight of the roof. The interior walls and the third story exterior walls are *fachwerk*— half-timber construction with a brick infill (Blair 1964; CHP 2007). *Fachwerk* construction is an Old World building technique brought to America by German and other European immigrants (Glassie 1968; Kniffen 1965; Stanton 1985; Tishler 1986). The interior walls are filled with low-fired brick (Figure 5). The exterior walls are filled with Dutch biscuits, a short wood plank wrapped in mud and straw that provides insulation for the dwelling, and whose name comes from local slang (Figures 6-9).

Dendrochronology

Dendrochronology is the science of studying tree growth patterns and assigning accurate calendar dates to the formation of individual tree rings. Dendroarchaeology is a sub-field of dendrochronology that utilizes dendrochronological techniques to date the creation of wooden objects or the construction of buildings. Dendroarchaeological analysis enables dating and/or verification of construction dates of buildings. Tree-ring dating has been successfully used throughout the United States to date building construction (e.g., Bortolot et al. 2001; Grissino-Mayer and van de Gevel 2007; Stahle 1979; Therrel 2000; Towner et al. 2001; Wight and Grissino-Mayer 2004). Locally, Baas and Rubino (2012) used dendroarchaeological techniques to date the construction of a Switzerland County barn.

Using tree rings to determine or verify the construction date of a historic wooden object or structure requires sample collection, surface preparation, tree ring identification, measuring each tree ring, and crossdating. Briefly for this project, samples were obtained using a drill and dry wood boring bit (Figure 10); samples were glued into mounting boards (Figure 11); and progressively finer and finer grits of sandpaper were used (Stokes and Smiley 1968) to allow for tree-ring identification and measurement. Individual rings were assigned years, not calendar

dates, at 40× magnification using a boom dissecting microscope. At this stage in the dating process, each of the samples' tree-ring series are considered floating since individual rings were simply assigned years and not calendar dates. Assignment of calendar dates to individual rings was performed by crossdating the samples taken from Community House No. 2 to regional tree-ring chronologies (series of accurately dated and measured tree rings compiled from studying living trees or other historically erected buildings). Crossdating is a method of pattern matching that utilizes the pattern of small and large rings in tree-ring series with known dates to samples of unknown age (Figure 12). Crossdating was performed using graphical methods (skeleton plots) and with a computer once each of the tree rings was measured to the nearest 0.01 mm (0.0004 in). A more detailed explanation of methodology can be found in Baas' and Rubino's (2012) successful dating of a Switzerland County barn.

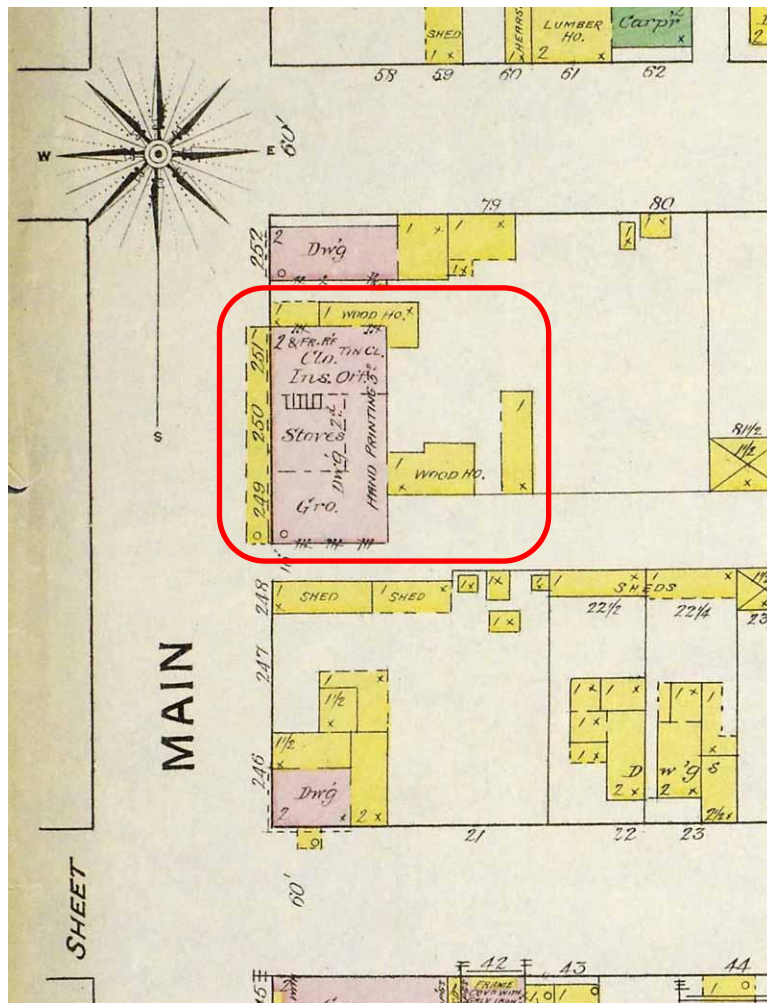


Figure 2. 1888 map of Community House No. 2 showing its use as a commercial structure (Sanborn Map and Publishing Co., New Harmony, Indiana:1).

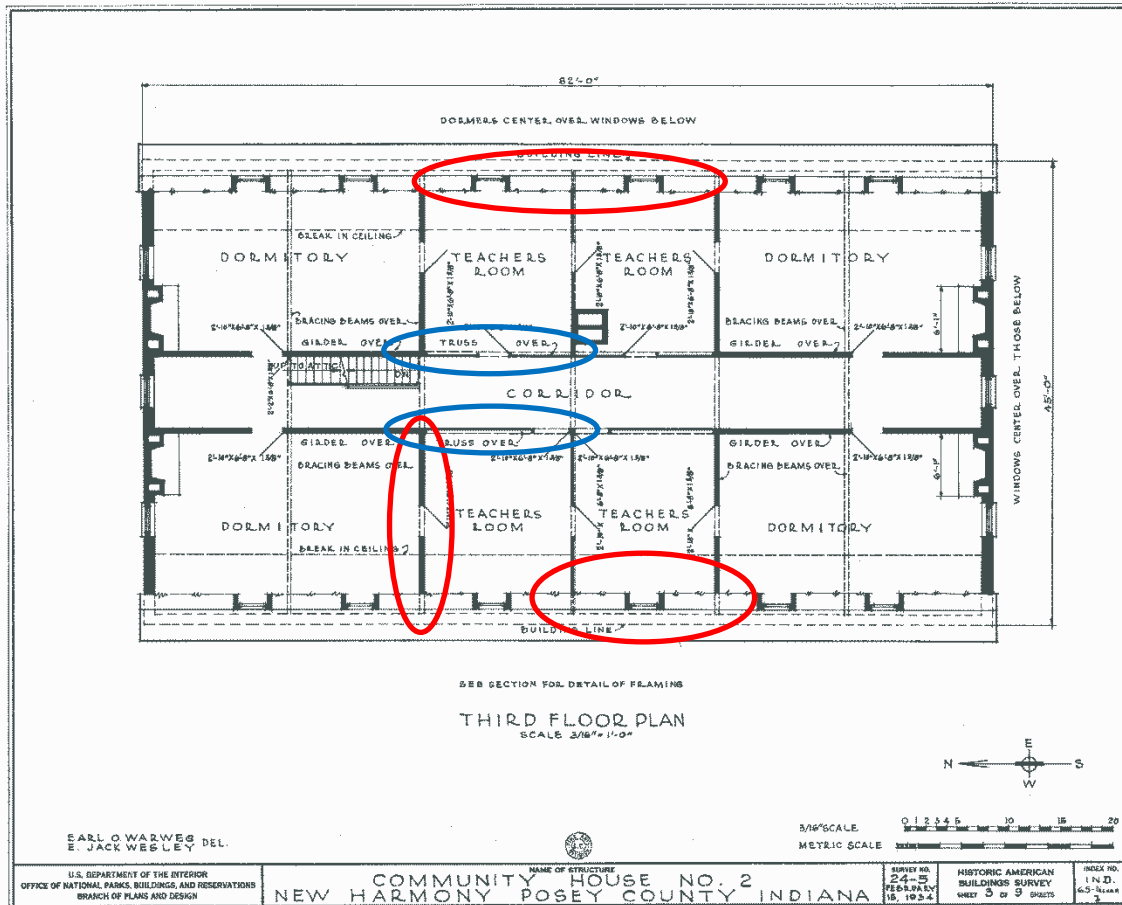


Figure 3. Historic American Building Survey for Community House No. 2, 1933. The red ovals show third story wall sample locations. The blue ovals show attic truss sample locations (Library of Congress, Prints & Photographs Division, HABS IND, 65-NEHAR, 2).

The likely construction date of a building can be determined if numerous timbers from throughout a structure share a common (or comparable) death, or harvest, date. The outermost ring in a timber can be considered a tree's death date if bark or wane is present, since the ring would have been the last formed ring prior to death. Wane is identified by a uniform, rounded outer timber surface that is free of any tool marks; it is simply the outermost ring that was adjacent to the bark. Bark is often stripped prior to construction or sloughs off over time or from handling during construction. Since the main goal of this investigation was to determine the construction date of Community House No. 2, sampling focused on timbers that either had a bark or wane edge. Sampling was performed on the structure's third story and attic since both afforded access to the timberwork of the building.

For each sample, digital photographs were taken, and the timber location was noted. Samples were placed in labeled PVC tubes to protect them during transport. Samples were assigned an identification containing three parts: a three-letter structure identification (CHS for Community House), a two digit provenience identification (individual timber), and a letter indicating the individual series obtained from a timber. For example, CHS06B identifies the second series (B) taken from the sixth sampled timber (06) of the building. Often, more than one sample was taken for an individual timber since the main species present in the building was

tulip poplar, a species that frequently has missing rings. Missing rings (years when no tree ring forms over the entire trunk or formed at all in a given year) are caused by extreme stress, such as a drought, or injury. By taking two samples from a timber, the likelihood of obtaining a sample without a missing ring increases. Also, replicate samples help in ensuring that a timber did in fact exhibit a wane edge. In addition to the cores taken from the building, two additional samples (CHS17A and CHS18A) were analyzed. These two samples were cross sections obtained from stored timbers that were too damaged to be reused in the most recent renovation of the building (Figure 8). However, their exact location within the structure is unknown.

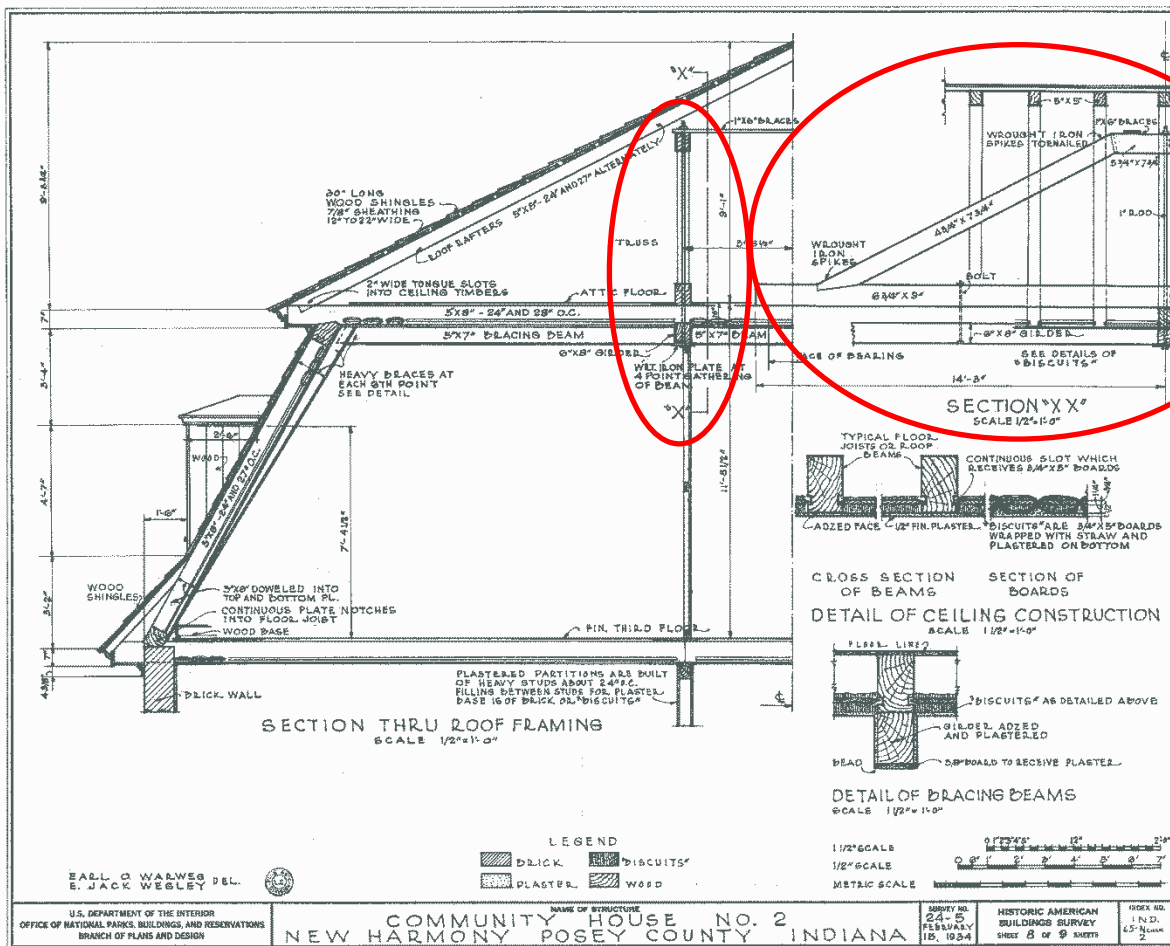


Figure 4. Historic American Building Survey for Community House No. 2, 1933 showing section through attic and third story (Library of Congress, Prints & Photographs Division, HABS IND, 65-NEHAR, 2). The attic truss is illustrated in the two views within the red ovals.

Each timber was identified to the lowest possible taxonomic rank to determine the choice of construction material of the builders. Macroscopic and microscopic wood anatomical structures and the identification keys prepared by Panshin and de Zeeuw (1980) were used in identification. Thin sections were made from the cores using double-edged razor blades; these sections were subsequently viewed under a compound light microscope (100 and 400 \times). Using wood anatomy, identification to species level is not always possible. For example, a red oak timber could have been taken from any of the red oak (*Quercus* subgenus *Erythrobalanus*) trees

native to the area. In this instance, such a timber could be a pin-oak or a shingle-oak. Therefore, for oaks, identification of species beyond the subgeneric level is not possible.



Figure 5. Third floor central space looking north. The exposed wall shows vertical and horizontal timber construction, and angled bracing. The framing is filled with low-fired bricks (photo courtesy of Christopher Baas).



Figure 6. Third floor central space looking southeast at east wall. The exposed wall shows the angled framing timbers of the mansard roof, with Dutch biscuits in between (photo courtesy of Christopher Baas).



Figure 7. Dutch biscuit—a short wood plank wrapped in mud and straw (photo courtesy of Christopher Baas).

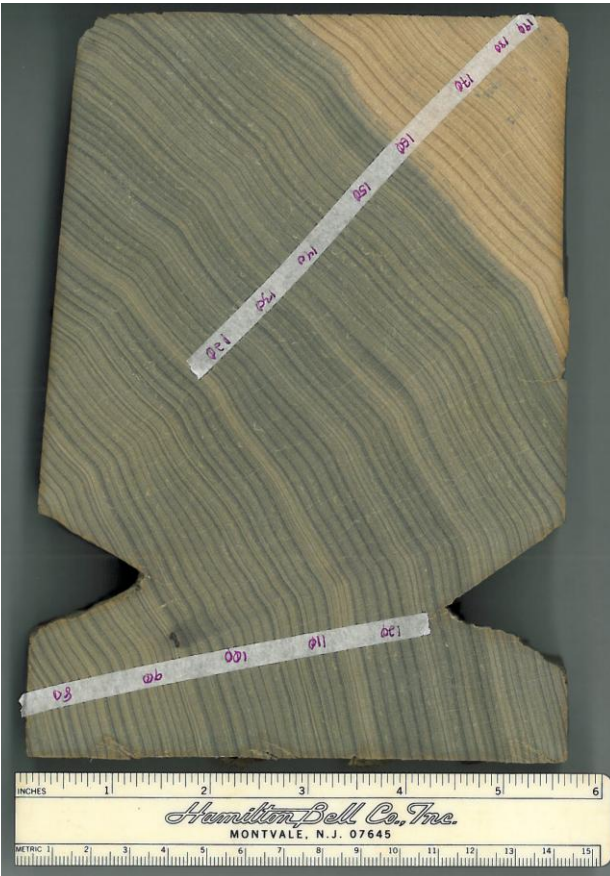


Figure 8. Cross section of a tulip poplar timber (CHS17) used to hold Dutch biscuits. Biscuits fit in the notches rabbeted along the length of the timber (photo courtesy of Darrin Rubino).



Figure 9. West attic truss looking north. Roof rafters are visible behind the truss and HVAC equipment (photo courtesy of Christopher Baas).



Figure 10. Core samples were obtained using a drill and dry wood boring bit (photo courtesy of Christopher Baas).

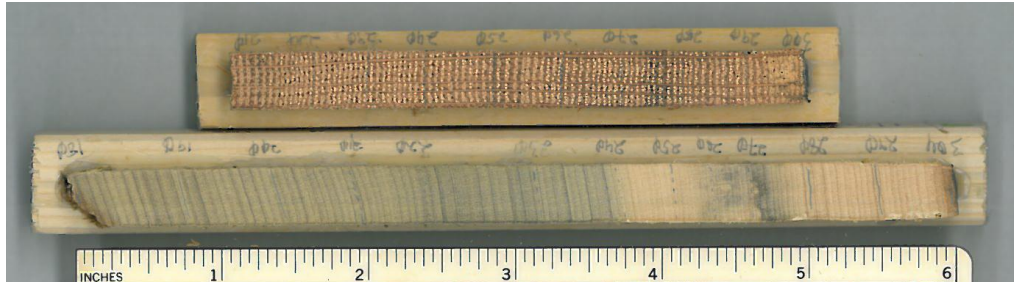


Figure 11. Cores of red oak (CHS04A; top) and tulip poplar (CHS12A; bottom) (photo courtesy of Darrin Rubino).

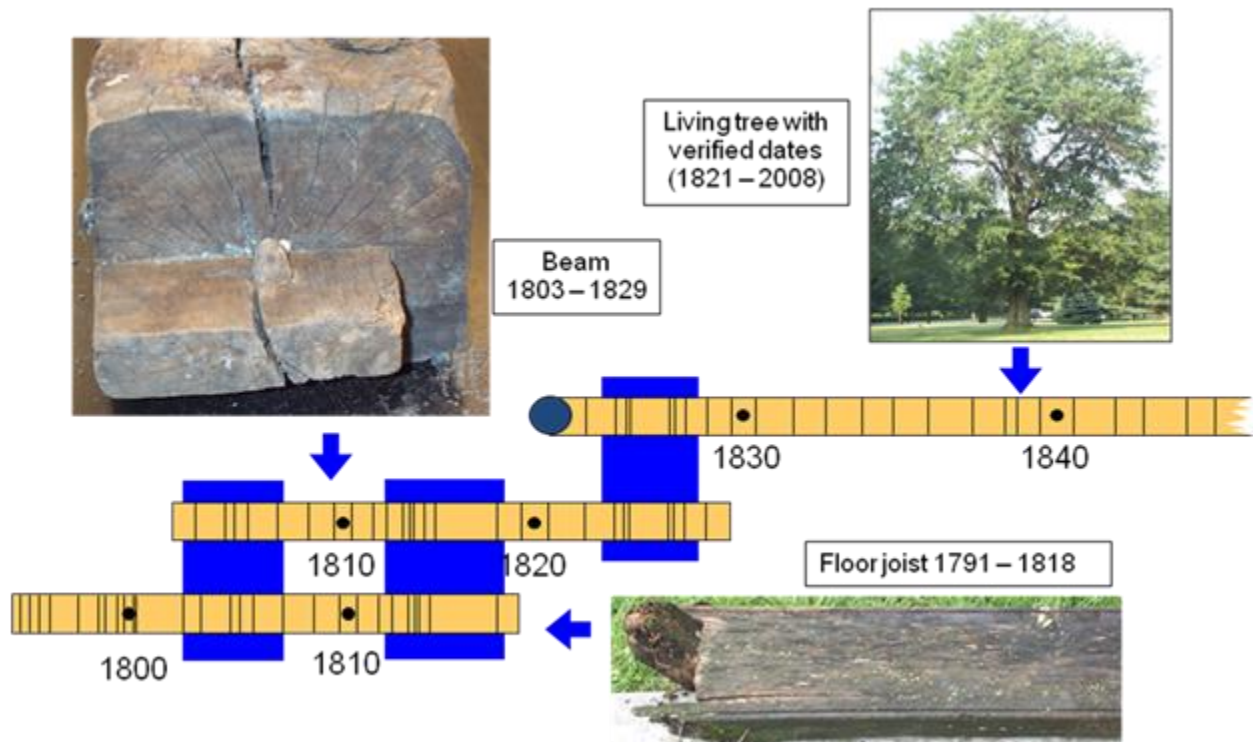


Figure 12. Crossdating is performed by identifying the tree-ring patterns in samples with verified dates (upper right) and by comparing and locating the same patterns in samples with unknown dates. Blue areas represent growth patterns that enable crossdating to be performed. Note: the sample lengths used in this demonstration are much shorter than those that are used in actual analyses (photo and illustration courtesy of Darrin Rubino).

Results

Dendroarchaeological samples were obtained from three different timber types (red oak, sweet gum, and tulip poplar; Table 1). A total of 24 samples were taken from 18 different timbers (Table 2). Tulip poplar was the most commonly sampled timber and yielded the longest chronology (1686 - 1858). A description of each of the timbers sampled can be found in Table 3, and the location of timbers is noted in Figures 13 and 14. The mean annual growth (composite chronology made from all timbers) for red oak and tulip poplar is found in Figure 15. The mean ring width of the tulip poplar rings was 1.29 ± 0.61 mm, and the mean red oak width was 1.22 ± 0.20 mm (1 inch = 25.4 mm; Table 4).

Table 1. Timber types analyzed from Community House No. 2. More than one species of tree may be called by a single timber type because identification to the species level is not always possible for various timber types. A species is considered possible and is listed below if its natural distribution occurs in Posey County, Indiana. Species distributions are based on Jackson (2004); taxonomy and nomenclature follows Gleason and Cronquist (1991).

Timber type	Scientific name	Common name
Red oak	<i>Quercus coccinea</i> Muenchh.	Scarlet oak
	<i>Q. falcata</i> Michx.	Southern red oak
	<i>Q. imbricaria</i> Michx.	Shingle-oak
	<i>Q. marilandica</i> Muenchh.	Black-jack oak
	<i>Q. pagoda</i> Raf.	Cherrybark-oak
	<i>Q. palustris</i> Muenchh.	Pin-oak
	<i>Q. rubra</i> L.	Northern red oak
	<i>Q. shumardii</i> Buckley	Shumard oak
	<i>Q. velutina</i> Lam.	Black oak
Sweet gum	<i>Liquidambar styraciflua</i> L.	Sweet or Red gum
Tulip poplar	<i>Liriodendron tulipifera</i> L.	Tulip or yellow poplar

Table 2. Chronologies (series of measured and dated tree rings) created from dendroarchaeological samples collected from Community House No. 2.

Timber	Number of proveniences	Number of series	Number of tree rings	Time span	Number of Years
Community House					
Tulip poplar	14	20	1573	1686 – 1858	173
Red oak	2	2	158	1727 – 1820	94

Sweet gum	2	2		NA	NA
Total	18	24	1731	1686 – 1858	173

Table 3. Series data for each of the timbers sampled from Community House No. 2. “First” and “Last” refer to the first and last years measured or present in a series. A “w” indicates the presence of wane and “b” indicates bark associated with the outermost ring of each series. See text for an explanation regarding the identification code of individual series obtained from a provenience. If more than one sample (series) was taken from an individual timber (provenience), the species and provenience description are only given once and not for each series. Samples with no dates were not dated reliably and were omitted from analysis. All samples have been archived in the Hanover College botanical collection.

Sample	Species	Present			Measured		Location	Provenience
		First	Last	Outer	First	Last		
CHS01A	Tulip poplar	1743	1821	w	1745	1820	Third story	Vertical post
CHS01B		1731	1821	w	1733	1820		
CHS02A	Tulip poplar	1731	1821	w	1732	1820	Third story	Horizontal beam
CHS03A	Red oak	1755	1821	w	1756	1820	Third story	Vertical post/door frame
CHS04A	Red oak	1726	1820	w	1727	1819	Third story	Vertical post
CHS05A	Tulip poplar	1728	1821	w	1730	1820	Third story	Ceiling joist
CHS05B		1798	1821	w	1800	1820		
CHS06A	Tulip poplar	1803	1822	w	1804	1821	Third story	Timber by window
CHS06B		1728	1822	w	1730	1821		
CHS07A	Tulip poplar	1798	1822	w	1799	1821	Third story	Timber by window
CHS07B		1722	1821		1723	1820		
CHS08A	Tulip poplar	1723	1822	w	1724	1821	Third story	Timber by window
CHS08B		1682	1822	w	1686	1821		
CHS09A	Sweet gum			w			Third story	Vertical post
CHS10A	Tulip poplar	1741	1859	w	1742	1858	Attic	Truss diagonal
CHS11A	Tulip poplar	1766	1859	w	1770	1858	Attic	Truss horizontal
CHS12A	Tulip poplar	1739	1859	w	1740	1858	Attic	Truss diagonal
CHS13A	Tulip poplar	1770	1859	w	1771	1858	Attic	Truss diagonal
CHS14A	Tulip poplar	1803	1822	b	1805	1821	Attic	Roof rafter
CHS14B		1782	1820		1783	1819		
CHS15A	Tulip poplar	1785	1822	b	1786	1821	Attic	Roof joist/rafter
CHS16A	Sweet gum			w				Roof rafter
CHS17A	Tulip poplar	1695	1820		1696	1818	Unknown	Random timber from museum storage
CHS18A	Tulip poplar	1703	1821	w	1704	1820	Unknown	Random timber from museum storage

Accurate date assignment for individual series was assessed by 1) comparing each of the series against other series collected from Community House No. 2 (internal dating assessment), and 2) combining each of the species into a composite chronology and comparing this composite to other regional series containing accurately dated and verified tree-ring series (external dating assessment). These analyses were performed for tulip poplar and red oak separately. For both assessment methods, series were broken into 50-year segments that overlapped each other by 25 years (e.g., 1700 – 1749, 1725 -1774, 1750 – 1799, etc.). To assess internal consistency in dating, each of the series was broken into segments and correlated against all other series collected from Community House No. 2. Significant correlations thus indicate a statistically supported date assignment among each of the series obtained from the building. For the tulip poplar samples there was a very strong and significant ($P < 0.001$) series intercorrelation ($r = 0.712$; Table 4). Additionally, each of the 50-year segments were significantly correlated ($P < 0.01$) with the other series obtained from Community House No. 2. These findings suggest that internal dating (date assignments for each tulip poplar sample) is correct.

A composite tulip-poplar chronology was created by finding the mean growth for each year data was available. To check for external dating accuracy (accurate dating of the structure compared to other tulip poplar chronologies) the composite chronology was compared and correlated to other regional sets of accurately dated tree-ring chronologies. The composite chronology was broken into overlapping segments to ensure dating was accurate throughout the chronology. The individual segments were strongly and significantly correlated with other regional chronologies (Table 5). We conclude that date assignments for the tulip poplars are correct both internally and externally.

Similar analyses were conducted for the red oak series. Since only two red oak samples were obtained from Community House No. 2 interpretation of date assignments must be done with caution. However, we are confident in date assignment for the red oaks. The two samples were not significantly correlated at the $\alpha = 0.01$ level but were at the $\alpha = 0.05$ level (Table 4). Additionally, the outermost 50-year segments of each of the two series were significantly correlated (Table 4). When comparing the mean composite chronology with other regional oak chronologies highly significant ($P < 0.01$) correlations were found (Table 6).

Table 4. Series and segment (50-year segments overlapping by 25 years) correlation analysis and mean and standard deviation (mm) of each dated series from Community House No. 2. In each column headed by a set of dates the correlation coefficient found by correlating each of the series' segments against all other series of that species is given. A correlation coefficient greater than 0.328 indicates a statistically significant correlation ($P < 0.01$).

Series	1675 - 1724	1700 - 1749	1725 - 1774	1750 - 1799	1775 - 1824	1800 - 1849	1825 - 1874	Series <i>r</i> -value	Mean	SD
Tulip poplar										
CHS01A			0.68	0.68	0.67			0.645	0.81	0.41
CHS01B			0.74	0.70	0.71			0.694	0.95	0.55
CHS02A			0.61	0.54	0.47			0.543	1.17	0.67
CHS05A			0.68	0.71	0.67			0.663	1.62	0.70
CHS05B						0.54		0.537	1.19	0.41

CHS06A						0.75		0.753	0.98	0.45
CHS06B			0.77	0.82	0.82			0.801	1.32	0.60
CHS07A					0.56			0.560	0.98	0.25
CHS07B		0.64	0.72	0.81	0.80			0.758	1.47	0.71
CHS08A		0.74	0.82	0.84	0.80			0.777	0.90	0.52
CHS08B	0.50	0.58	0.83	0.83	0.81			0.683	1.20	0.79
CHS10A			0.77	0.8	0.67	0.72	0.72	0.754	1.24	0.46
CHS11A				0.82	0.77	0.76	0.70	0.784	1.70	0.62
CHS12A			0.70	0.81	0.75	0.62	0.59	0.681	1.23	0.47
CHS13A				0.84	0.85	0.77	0.79	0.807	1.17	0.52
CHS14A						0.64		0.641	1.40	0.53
CHS14B					0.77			0.773	1.52	0.58
CHS15A					0.86			0.857	1.27	0.41
CHS17A	0.65	0.66	0.74	0.84	0.86			0.736	1.77	0.84
CHS18A		0.55	0.61	0.69	0.76			0.637	1.39	0.74
All Tulip poplar								0.712	1.29	0.61
Red oak										
CHS03A				0.26	0.33			0.298	1.47	0.22
CHS04A				0.26	0.33			0.298	1.05	0.18
All Red oak								0.298	1.22	0.20

Table 5. Correlation results of 50-year segments (overlapping by 25 years) for tulip poplar compared to regional tulip poplar chronologies. Correlations are significant ($P < 0.01$) if the correlation coefficients are greater than 0.328. Parenthetical dates below each of the chronologies are the start and stop date of that chronology.

	Washington Co, IN 1637 – 1882	Switzerland Co, IN 1613 – 1811	Corydon, IN 1575 - 1901	Jefferson Co, IN 1546- 1845	Harrison Co, IN 1711 - 1845
1686 - 1735	0.33	0.26			
1711 - 1760	0.39	0.41		0.44	
1736 - 1785	0.55	0.58	0.56	0.63	0.47
1761 - 1810	0.55	0.41	0.61	0.55	0.41
1786 - 1835	0.52		0.52	0.37	0.35
1809 - 1858	0.59		0.46		

Table 6. Correlation results of 50-year segments (overlapping by 25 years) for red oak compared to regional white oak chronologies. Correlations are significant ($P < 0.01$) if the correlation coefficients are greater than 0.328. Parenthetical dates below each of the chronologies are the start and stop date of that chronology.

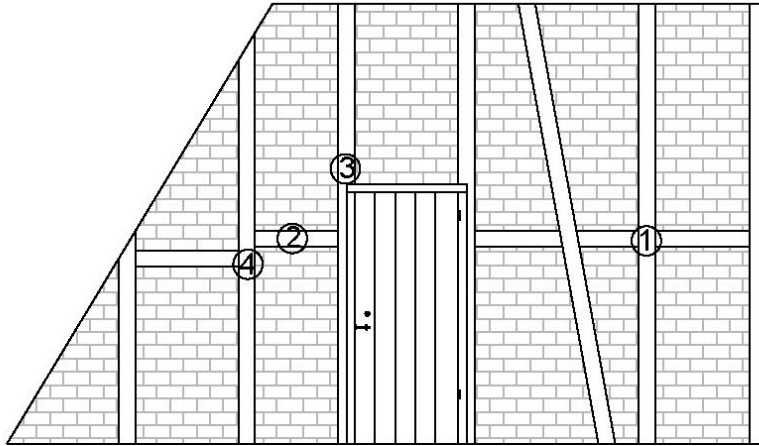
	Switzerland Co, IN 1630 – 1875	Corydon, IN 1732 - 1901	Jefferson Co, IN 1590- 1899	Paoli, IN 1652 - 1846
1727 – 1776	0.60		0.63	0.65
1752 – 1801	0.55	0.47	0.53	0.52
1771 – 1820	0.42	0.37	0.39	0.25

Discussion

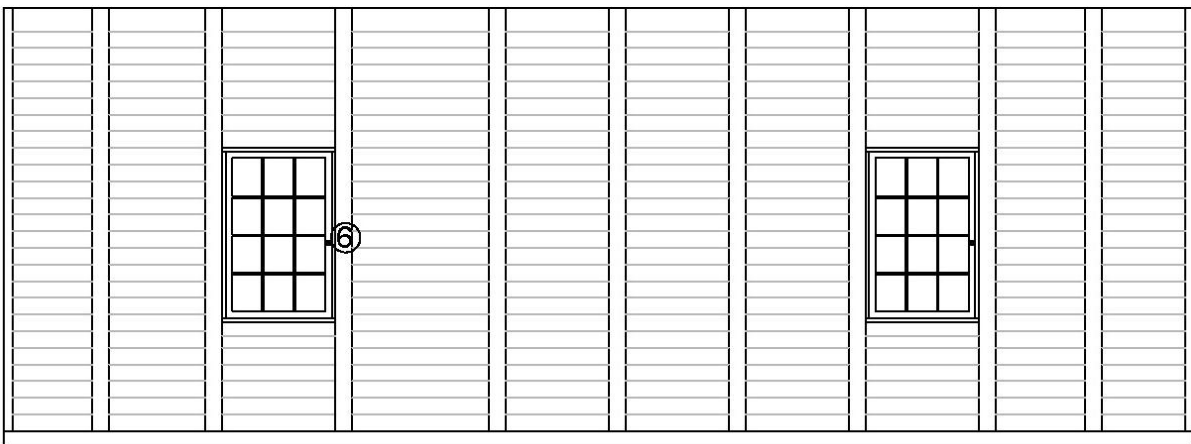
The goal of this study was to use dendroarchaeological methods to investigate New Harmony’s Community House No 2. The results confirm that the structure was completed during the Harmonist ownership of the town (1814-1824), and that it was most likely finished by the end of 1822. The results also identified timber species used in Harmonist construction, confirmed known ending dates for construction, and clarified the timing of non-Harmonist modifications to the building. It could not confirm the year construction started.

The study confirmed the Harmonists’ preference for Tulip poplar (*Liriodendron tulipifera*) over other timber species. Fourteen of the eighteen samples collected in the Community House’s third story and attic are tulip poplar. In his study of Harmonist houses, Blair explains that the group’s carpenters found tulip poplar easier to work, that it had ample structural strength, and handled the humid and moist riverside conditions of southern Indiana. Occasionally they used walnut, but typically even Harmonist furniture and interior paneling was tulip poplar (Blair 1965:58). The use of tulip poplar is not surprising since it is common throughout southern Indiana, and was a common timber choice for frame construction throughout the nineteenth century (CHP 2007:35).

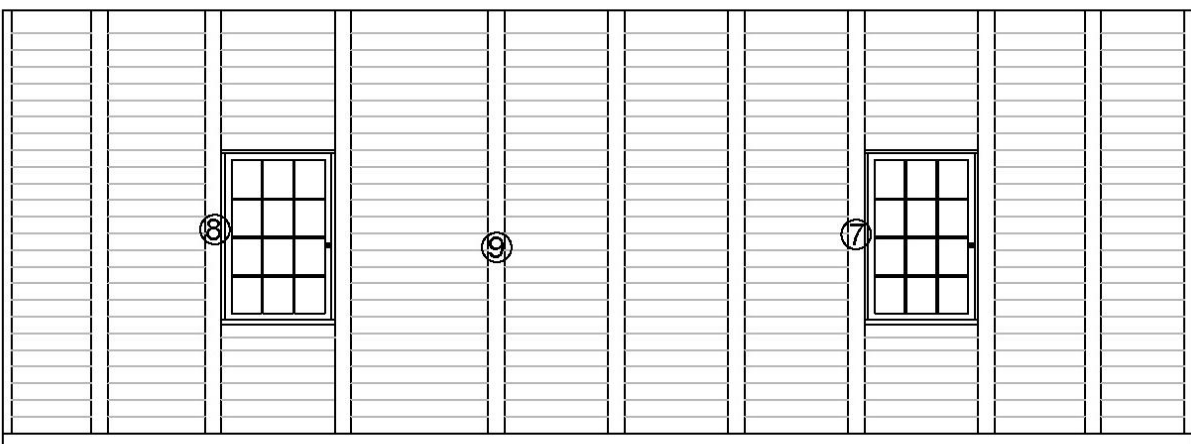
Perhaps what is more interesting is the use of two red oak (*Quercus* spp.) posts in the interior wall of the third floor (CHS02A and CHS03A), and the two samples of sweet gum (*Liquidambar styraciflua*) in the exterior east wall and the roof (CHS09A and CHS16A). Like poplar, red oak was a common species for nineteenth century timber construction, and it is easy to understand on a building of this scale how oak timbers could find their way into the structure. However, the use of sweet gum is rare, and its inclusion in the house is likely an accident. Sweet gum and tulip poplar would appear similar (e.g., color and anatomy, especially the sapwood) without close inspection. Tulip poplar is preferred over sweet gum based on such characteristics as superior drying properties—tulip poplar is more stable after drying (USDA 2007:1-8). Also, tulip poplar would have been much more common throughout the landscape since it tolerates a much wider set of environmental conditions than sweet gum.



3rd Floor Interior Wall (Looking North): Sample Locations



3rd Floor West Exterior Wall: Sample Locations



3rd Floor East Exterior Wall: Sample Locations

Figure 13. Community House No. 2-Third floor wall sample locations (illustration courtesy of Christopher Baas).

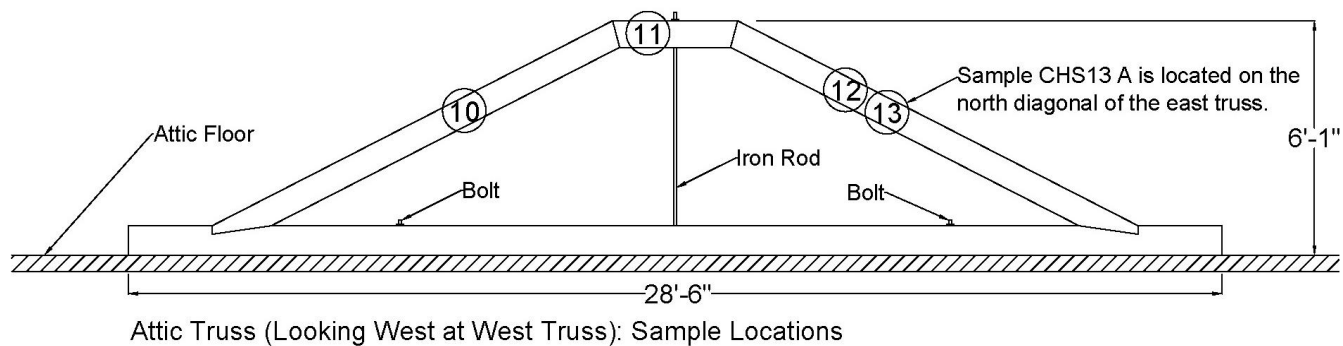


Figure 14. Community House No. 2-Attic truss sample locations (illustration courtesy of Christopher Baas).

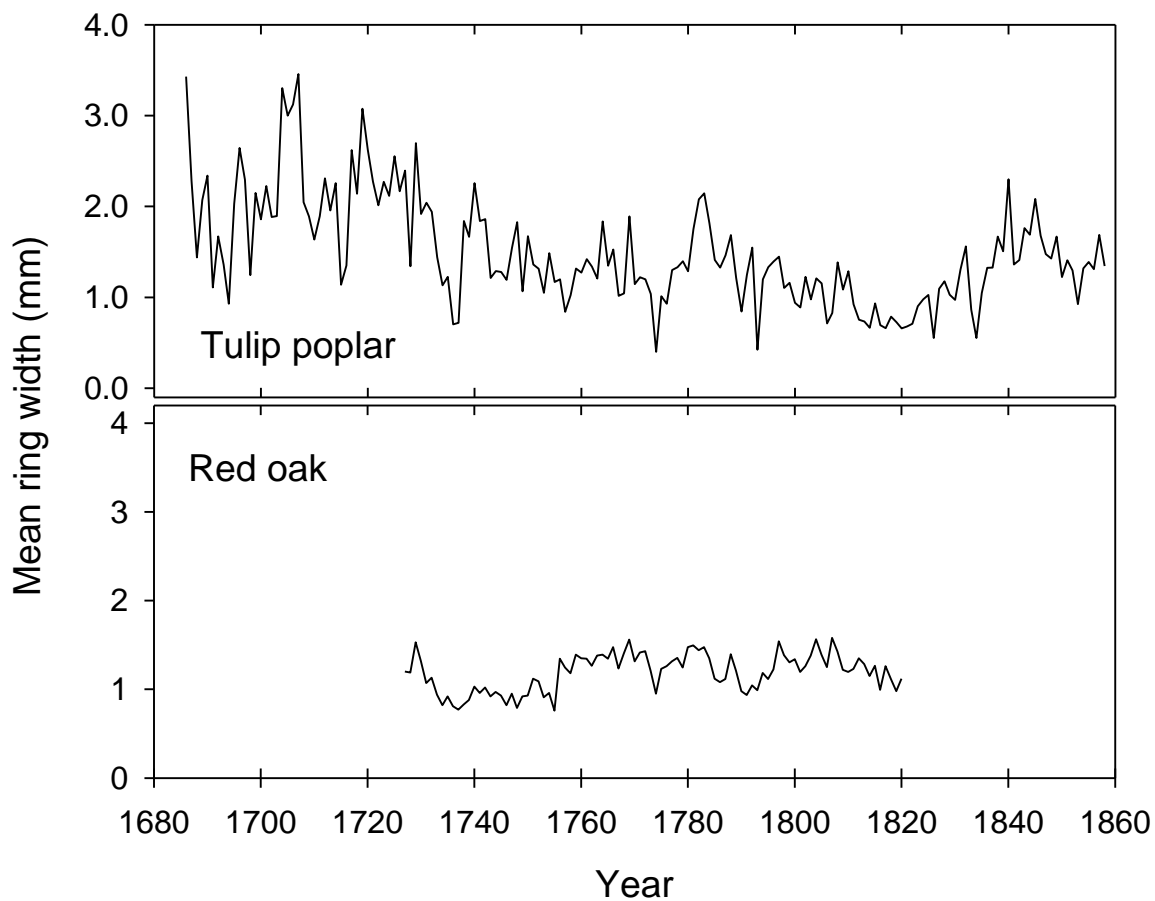


Figure 15. Mean annual growth of tulip poplar and red oak samples obtained from Community House 2.

The results of this study were successful in establishing a completion date for the dwelling's construction, and the date of attic's modification. However, it was not successful in establishing the starting date for the dwelling's construction. Since the samples come from the top of the building, they tell more about the end of the construction process rather than the beginning. Posts located in the third story and roof rafters located in the attic have dates of 1821. We have concluded that the timbers were harvested and added to the building in the year of 1822, because the entire 1821 growth ring is present, and at least part of the 1822 ring was found. These logs were most likely harvested after mid growing season (June of 1822). A date of 1822 is also supported in a letter written by George Rapp in May of that year: "52 persons are occupied building a community house, by September it will be finished" (CHP 2007:55). Until this study, the dwelling's completion date relied solely on Rapp's letter (Figure 16).

The study clarifies whether the attic truss is Harmonist, Owen, or a later modification. The Historic Structure Report describes it as Harmonist (CHP 2007:171):

Unlike other brick structures in New Harmony, however, the Community House Number Two's roof was so big that the Harmonists decided to add two additional trusses to the attic. The trusses run perpendicular to the roof rafters and attic joists. It seems that the trusses transfer weight onto the central-hall interior walls [of the stories below].

However, the report also suggests that it might not be original to the building (CHP 2007:156). Core samples point to the trusses being added in 1859, so they are neither from the Harmonist or Owen periods. The trusses were likely added by Achille Emery Fretageot when he purchased the building in the mid 1850's and "the interior was remodeled considerably" (CHP 2007:156). The addition of the trusses to the attic might simply have been to shore up an aging or inadequately designed structure. Since the trusses span locations where there were originally interior posts, they were likely added for structural support of the third story ceiling following the removal of interior partitions. Finally, the study also confirmed that the sampled roof rafters are original to the building, an observation made in the HSR (CHP 2007:156).

Since the sample locations were from the top of the structure, we cannot conclude a date for the beginning of the house's construction. Sample locations in the lower stories are unavailable because the exterior walls are brick, and the interior walls are finished in plaster. Also, a significant amount of historic timber material in the lower stories was likely removed during the 1950's restoration when the interior was "gutted" (CHP 2007:102).

2014 is New Harmony's bicentennial when renewed attention will be directed towards the community. Using tree ring data, with other archaeological investigations (for instance the geophysical investigation performed by ISMHS), to interpret Community House No. 2 and other Harmonist structures will enrich public history experiences.



Figure 16. Plaque on exterior west wall of Community House No. 2 showing 1816-1822 as the dates for the dwelling's construction. The study could not verify the 1816 start date, but supports an 1822 completion date (photo courtesy of Christopher Baas).

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NEW ALBANY'S RECENT INDUSTRIAL PAST AS REVEALED IN THE ARCHAEOLOGY OF THE LOOP ISLAND WETLANDS

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[Editors' note: To be consistent, site numbers will be written, for example, as 12W245, exceptions being when county abbreviations with an "I" before the numbers, such as Allen (Al) or Clark (Cl). Counties such as the latter will be designated with a space between the 12 and the county abbreviation and a space between the county abbreviation and the site number, such as 12 Fl 117 in the below article. This is done so that the reader understands that the site is from Floyd County (Fl), and the number of the site is 117, rather than 1117.]

Introduction

In 2011, the Falls of the Ohio Archaeological Society (FOAS) was awarded a Historic Preservation Fund archaeological grant administered by the Department of Natural Resources (IDNR) Division of Historic Preservation and Archaeology (DHPA) to complete a Phase 1a and Phase 1c archaeological survey and geomorphological assessment of a 47 acre (19 hectare) parcel known as the Loop Island Wetlands in Floyd County near the city of New Albany in Indiana. The project area lies along the Ohio River on the eastern border of Floyd County and is separated from Clark County by a creek (Figure 1). Under most conditions, water occupies 21 acres of the 47 acre property, leaving 26 acres available for survey. Physiographically, the property lies within an old meander creek scar downstream along the Ohio River. The project area includes two ponds or lagoons. Documentation from the landowner in the form of maps and aerial photographs indicates the larger pond had been a naturally created feature within the oxbow. The smaller pond, however, dates from 1963 at which time up to 7 feet of soil were taken for fill. However, the recent breach in the earthen containing wall of the smaller pond allowed another 7 acres to be accessible. Although the near-surface soil layers of this pond had been removed for borrow in the 1960s, it was thought that the earlier borrowing of nearly 2 meters of soil would allow deeper access to any buried cultural deposits that might be present. Therefore, 33 acres were available for intensive surface and subsurface archaeological investigation.

The project addressed multiple pressing needs, including recording and documenting archaeological sites that had been subjected to looting and extensive erosion in recent years. The area is also one of intensive prehistoric occupation, yet comparatively fewer archaeological sites have been recorded in Floyd County than other counties in southern Indiana. The project was driven largely, however, by the intention of the current landowner to reconstruct the breached earthen berm, causing a small pond to drain. The landowner, who has ever been a good steward of local resources, wished to ensure that no sensitive archaeological deposits would be impacted during the process. The idea for surveying the entire property grew from this initial need, especially as the ownership of the property was expected to change in the near future.



Figure 1. Location of Floyd County, Indiana. Map by Corn Island LLC.

Fieldwork entailed ground surface inspection, shovel probing, augering, trenching, and examination of the stream and river cutbanks. The property was divided into three general areas, based upon topography and natural features, for convenience of fieldwork and recordation. Four archaeological sites, 12 Fl 117, 12 Fl 118, 12 Fl 119, and 12 Fl 120, were discovered and investigated during the project. At the onset of the project, it was expected that prehistoric sites would be the most common site type encountered because the Falls of the Ohio River area is especially rich in such sites, especially within the immediate project vicinity. Surprisingly, only one site, namely 12 Fl 120, was prehistoric. The remaining three sites dated from the historic period, and more specifically, to the recent past of the early to mid-twentieth century. Furthermore, these sites appeared to be industrial in nature. The focus of the analysis and reporting shifted, therefore, to an emphasis on industrial archaeology and the opportunities for research offered by the pursuit of this branch of the larger archaeological discipline in the New Albany area.

Importantly, this project entailed a cooperative effort between avocational and professional archaeologists. Members of FOAS, other members of the general public, and professional archaeologists and historians from Corn Island Archaeology LLC of Louisville, Kentucky (of whose staff many are FOAS members) worked side by side in both the field and the lab. Corn Island Archaeology provided logistical support for the project in the areas of equipment, lab facilities, financial support, and in-kind labor. Haywood Archaeological Services of Ohio assisted with a geomorphological assessment of the property. Several FOAS monthly meetings were dedicated to presentations on the history of Loop Island Wetlands and to washing and sorting of artifacts.

Industrial Archaeology at the Falls of the Ohio River

As in many areas, archaeological investigations in the Falls of the Ohio River region have generally documented resources of one of three types:

- near-surface or deeply buried prehistoric sites;

- rural nineteenth to early twentieth century farmsteads; and
- urban sites, such as residences or urban commercial enterprises (groceries, taverns, etc.).

The investigation of industrial archaeological sites within the immediate area is less common. Palmer and Neaverson (1998:1) define industrial archaeology as:

the systematic study of structures and artifacts as a means of enlarging our understanding of the industrial past.

The objective of industrial archaeologists is to derive an understanding of the remains of industrialization. This could include, among other topics, information on the technology, transport, and buildings that are associated with manufacture or raw material production (Palmer and Neaverson 1998:4-5). Traditionally, in this comparatively recent branch of archaeology, the focus of study has been on sites, which are comprised of structures, buildings, and landscapes. Because industrial archaeology commonly deals with the recent past, there are often photos, maps, oral history, patents, trade catalogs, building permits, corporate archives, and other documentation (manuals, engineering records) available to augment observed physical remains (McVarish 2008). The combined body of data, namely the built environment and the archived documentation, allows a more complete understanding of industrial processes and operations.

Many important industrial sites are examples of preservation and public interpretation. However, as archaeologists have been reminded, archaeology is more than preservation (Palmer and Neaverson 1998:3). What is so often missing in archaeological treatises of industrial sites are data on the assemblages of artifacts that were associated with the sites or industries. This is sometimes the case because there is a paucity of industrial-related artifacts in archaeological contexts to be found. With exceptions, comprehensive inventories or reference collections of artifacts associated with a specific industry are rare. There is a real need to record the artifacts as well as the structures and/or buildings that “illuminate the context of people at work in the past” (Palmer and Neaverson 1998:3).

Furthermore, industrial archaeological studies have often not lived up to their research potential in that they have focused more on the recognition of the physical remains of the industrial heritage and less on the social implications of the industry. Scholarly treatments with a critical, analytical, or theoretical emphasis related to the impacts of the industry upon human societies within a specific area are sadly lacking (Martin 2009; Palmer and Neaverson 1998). As has been noted by Martin (2009), the Industrial Revolution is “one of the most important social phenomena responsible for shaping the modern world.” Themes that could be addressed, among many others, include:

- The rise of manufacturing;
- The origins and effects of industrialization (Palmer and Neaverson 1998:3);
- Associated changes in social dimensions; and
- Changes in scale and intensity of productivity, settlement patterns, distribution, exchange, and control (Martin 2009:205).

Furthermore, as archaeologists have noted, the recent past, which contains the remains of the beginnings of industrialization, is threatened. Often the industries were located in urban settings, or just beyond city limits. Urban renewal, corporate expansion, and suburban sprawl

have been rapidly eliminating or altering the physical remains of the early industries of areas. Since the recent past often lies within the early to mid-century decades of the twentieth century, it is often not considered old enough or significant enough to be studied and/or preserved.

Within the Falls of the Ohio River region, there are several projects that have addressed nineteenth and early twentieth century industry. Charles Hockensmith, retained by Gray & Pape, Inc., investigated the historic lime industry in the vicinity of Utica in Clark County and documented multiple ruined groundhog kilns (Hockensmith 2009). Recently, Christina Pfau and Barbara DeMent have been documenting the history of the De Pauw Glassworks of New Albany, and recording data related to an artifact scatter associated with the former plant.

Additional local examples of industrial archaeology have occurred across the river in Louisville, Kentucky and include primarily mills and potteries. David Wards Mill was excavated by Joseph Granger (Granger 1984). Several potteries, including the Lewis Pottery (Stradling and Stradling 2001), the Thomas Pottery, Cultural Resource Analysts (CRA) (McKelway 1995) and AMEC Environment and Infrastructure (Duane Simpson, personal communication 2013), and the Conrad Redware Pottery (Bader et al. 2011) have all been scientifically investigated and are in the process of being fully reported. An unusual case in Louisville occurred at a parking garage project in which archaeologists uncovered and documented resources related specifically to a mid-nineteenth century druggist laboratory (Bader 2003). Archaeological remains associated with the early nineteenth century Louisville Cement Company were studied during multi-year archaeological data recovery efforts at the Falls (Andrews et al. 2011). Hockensmith (2001, 2002a, 2002b, 2003, 2004, and 2005) has done extensive study on the brick making industry of Louisville.

Yet these projects, in common with many that address industrial sites, have been largely descriptive in nature. The physical remains—primarily ruined structures and features—of the industrial sites have been described, the history of the industry researched and briefly presented to the extent such data has been available, and the archaeological excavations detailed. Yet the objective of industrial archaeology—to enlighten scholars and historians regarding the technological processes of industry—has not lived up to its potential in the area. Specifically, data documenting the equipment and tools utilized in production, along with associated artifacts, is lacking.

New Albany History

Colonel John Paul of Madison, Indiana, entered at Vincennes (or purchased from the Government) an 826 acre tract of land between the Clark's Grant Line and the foot of the Knobs. Paul's interest in the area dated to as early as 1808, as he recognized the advantages of location for the site in terms of transportation, markets, and agricultural productivity (Williams & Co. 1882:139). By 1813, three brothers, Joel, Abner, and Nathaniel Scribner, established a small community on the tract that they acquired for ten dollars an acre, and named the place New Albany after the city of their birth in Albany, New York (Kramer 2001a). It was not until three years later that the first plat of the town was drawn. New Albany was formally incorporated in 1817. The city was from the outset intended to be developed for manufacturing purposes. In time, New Albany later became Floyd County's largest city and county seat.

Because of its location on the Ohio River, shipbuilding emerged as the county's most successful industry in the early nineteenth century (Kramer 2001a). The industry was well supplied with materials from the nearby knobs (Kramer 2001a). Some of the more lavish riverboats, such as the *Eclipse* and the *Robert E. Lee*, were built in New Albany. More than 350 steamboats were built in New Albany between 1817 and 1867 (Kramer 2001a). The boats were designed for the southern rivers, largely due to the fact that New Albany was located below the Falls of the Ohio. As the Civil War developed, southern steamboat owners refused to order boats from Yankee markets, and the market declined (Kramer 2001b).

In the year 1819 two boats were built in New Albany, but the name has not been ascertained. From 1820 to 1825 but one boat appears to have been built here, but from the latter date to 1830 twelve were built. It was about this time ascertained that the very best of ship timber existed on the bottoms north of New Albany, and there being a demand for steamboats, the business grew and developed rapidly. Six of these twelve boats were built by Washington Garrison, who hailed from Cape May. He located his establishment at Gut ford on Silver Creek, in the midst of the best ship timber. It is said his boats were roughly built, but strong and substantial. As fast as they were completed he floated them down Silver Creek to the Ohio, where he sold them (Williams & Co. 1882:169).

Although shipbuilding was initially the major economic force in the county, it was replaced by railroads in the early 1850s. In 1851, the New Albany & Salem Railroad opened, reaching Lake Michigan by the end of the decade (Kleber 2001). By the beginning of the Civil War, the shipbuilding business would decline, and the railroads, along with its associated industries, would pick up the slack. By 1870, when the Louisville, New Albany, & St. Louis Railroad was completed, the shipbuilding industry had almost completely died out.

New Albany was the largest city in Indiana by the middle of the nineteenth century. Large numbers of African American, French, German, and Irish immigrants moved into the area to work in the growing farming, quarry, and iron industries that prospered between 1876 and 1892. New Albany was a prime settlement area for these workers. An 1890 map of the city highlights the Ohio Falls Iron Works along with a furniture factory, railroad shops and yards, a woolen mill, hosiery mill, cotton mill, the Klerner Furniture Mill, and the J. Gardner Foundry (Miller 1934). In addition to these industries, plate glass and textiles became successful industries in the county (Kramer 2001a). Tanneries, stove works, warehouses, sawmills, breweries, and a box factory thrived at this time as well (Bruckman 1997). Around the industries were one and two-story dwellings, a few grocers, saloons and beer gardens, drugstores, and barber shops. The former dominance of agriculture gave way to these industries for almost two decades until the 1890s, at which time the Panic of 1893 caused many of these businesses to close.

The commercial district of New Albany saw rapid expansion after 1890. New public buildings were opened, and a variety of retail businesses and entertainment houses were located in the district. Also at this time, new sections of working and middle to upper class housing areas were developed to house the workers in the nearby factories. This working class district is known as the Oak Street District (Bruckman 1997:75; Thayer and Charron 1994:72).

In the case of the current project area, the industries were sited outside or on the periphery of the city, in an area that was not platted on early city maps such as Sanborn Fire Insurance mapping (Figure 2). Industries found near the Loop Island Wetlands and downriver dating between approximately 1850 to the 1930s (Amster 1963; Bogle 1951; Miller 1934) include the following:

- Calumet Fertilizer Company off Market Street at Silver Street;
- D. J. Conger's Brick Yard at Market Street and East Street;
- Taylor's Bent Wood Works at Rear Market Street and East Street;
- Hornung's Brewery at Main Street and East 18th Street;
- Louisville, New Albany, and Chicago Passenger Depot at Vincennes Street and Main Street;
- Hoffman's Coal Elevator at Water Street and East 14th Street;
- Bir and Neely Saw Mills at Water Street and East 13th Street (lumber yard was up East 14th Street at Market Street);
- Ford/ Star/ New Albany Glass Works on Water Street between East 9th and East 13th Streets;
- Barth's Tannery at Water Street and East 9th Street;
- E. W. Fawcett Coal Elevator at Water Street and East 9th Street; and
- New Albany Veneering Company (on site of glass works).



Figure 2. Index of Map of City of New Albany, Indiana, showing first development near Grant 24 (Sanborn 1891).

New Albany is still the industrial center of the county today, and houses many industries, including plastic moldings, automotive parts, air filters, and electrical components. The Loop Island Wetlands Archaeological Project revealed information related to several industries, as described below.

The Moser Leather Company Complex

Site 12 Fl 119 is the Moser Leather Company Complex. The Indiana Historical Society's history of the Moser Company states:

George Moser immigrated to the United States from Germany as a teenager in the late 1860s. He settled in New Albany, where his elder brother ran a tailoring business, and learned the tanner's trade under August Barth, who had established Barth's Tannery on East Tenth Street in 1864. After ten years with Barth, Moser purchased the Lockwood Brothers tannery at 272–278 East Eighth Street in 1878. He enlarged and improved it and went into business for himself. In July 1891 Moser brought his nephew John M. Moser into the firm as a partner and changed the name of the tannery to George Moser & Company. By 1892 the company employed thirty to thirty-five men, sold its products to jobbers across the country, and was handling about 15,000 medium-weight hides per year.

Moser specialized in high-grade leather for harness and collar makers; the company marketed its product as Hemlock Collar Leather. In 1900 Charles E. Moser assumed his brother John's interest in George Moser & Company. In 1905 [the date is actually 1915 according to the city directory and evidence in deeds] George opened an additional leather plant, which he named the Indiana Leather Company, on Silver Street, south of the Pennsylvania Railroad. Fire destroyed the East Eighth Street tannery in 1914. George died the same year, and his heirs renamed the remaining Indiana Leather Company the George Moser Leather Company. Eventually George Moser's sons George Jr., Julius, and Karl joined the company, but it was George's partner (and nephew), Charles Moser, who assumed the presidency. By 1936 the George Moser Leather Company covered nearly eight acres and employed approximately one hundred workers. The company was a wholesale leather manufacturer, tanning hides purchased by the carload and converting them into leather for shoes, belts, or saddles. In the 1980s the company became the Caldwell/Moser Leather Company.

In the 1990s the company continued to tan leather in an old-fashioned manner, with a four-week treatment in a solution of water and tree bark from South America. While the traditional way costs more, the leather lasts longer, and the process does not harm the environment as does the chromium-salt process used by most tanneries. In 1998 the company employed seventy and forecast sales of \$12 million. Jim Head held the position of general manager. Leather from the tannery was used in Klein tools, G. H. Bass shoes, and Harley-Davidson motorcycle saddlebags [Indiana Historical Society 2013].

According to Caron's City Directories (Caron Directory Company 1913-15), the Moser Family moved their tannery to the east side of Silver Street between 1913 and 1915 and briefly renamed it the Indiana Tannery Company (Figure 3).

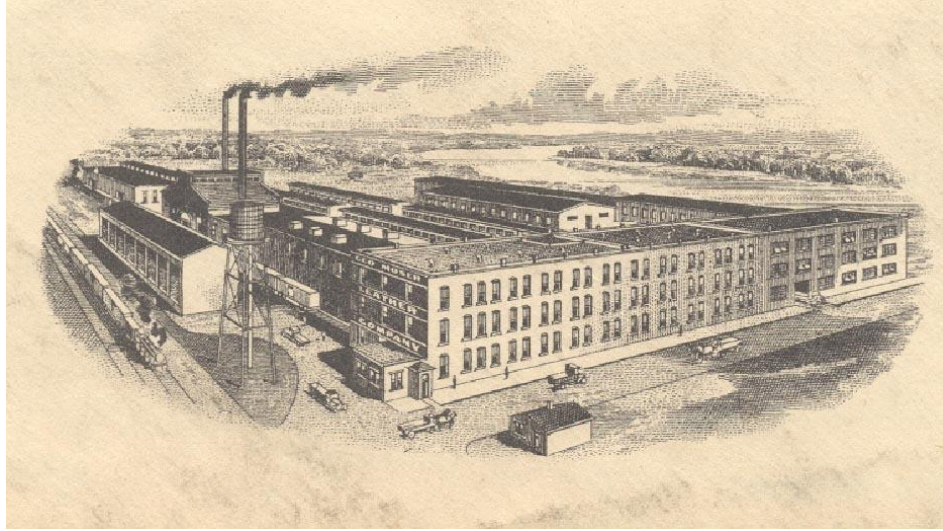


Figure 3. View of the Moser Leather Company from letterhead of early 1900s. Image courtesy of Al Goodman.

The site occupies a significant portion of the upper terrace within an early to mid-twentieth century built environment. A number of vacant buildings were documented on a site visit to the tannery (Figure 4, 5, and 6). Several of the buildings have been demolished, leaving ghosts of their profiles on adjacent buildings. One of these, at least, had burned and subsequently been torn down, and another was modified due to the construction of a floodwall. Several supporting structures were noted that were the locations of specialized activities such as water filtration (Figure 7).

Much of the tannery property has been developed, leaving very little ground on which to conduct archaeology. Although several grassy areas surrounded the buildings, shovel probing met with resistance in the form of densely packed gravel or pavement. A railroad bed once extended along the front of the complex. There was a siding present, so this area was likely used to load and unload from trains. Based on historic photographs, this area was also used for automobile traffic and parking, contributing further to the ground disturbances outside the buildings. Beneath the pavement and gravel on the side yards, there may lie buried artifacts and midden. However, it would seem logical to expect that most of the tannery activities at this complex occurred within the buildings themselves, leaving little potential for meaningful data to be gathered through excavation.

The ground surface around the buildings was examined for surface artifacts. Broken window glass, brick fragments, along with nuts, bolts and miscellaneous metal items were found. Most of this material was not collected, since they were of uncertain age and the dates of construction of the buildings were well documented. The assemblage collected from the site was therefore low, not very diverse, and in general, unrelated to the tanning industry.



Figure 4. Westernmost tannery building with “THE MOSER LEATHER CO.”, facing southeast (photo by Anne Tobbe Bader).



Figure 5. Vacant tannery buildings near water tower, facing southwest (photo by Anne Tobbe Bader).



Figure 6. Additional vacant buildings at the tannery, facing southeast (photo by Anne Tobbe Bader).



Figure 7. FOAS member Randy Hollis examining a structure and objects associated with the tannery (photo by Anne Tobbe Bader).

An exception to this generalization was the collection of a small group of artifacts associated with wooden drum vats used for processing hides. Wooden artifacts that were parts of these drums, along with metal bolts and nuts, and rubber belts were found on the ground surface. The tannery is known to have utilized rotary drum vats (Figure 8). These vats rotated on an axle. As the rotating wet hides exerted much stress on the wood vat, straps encircled the vat. These were held in place along wooden tracks on the exterior. Within the vat, hides were cleaned of soluble material by the addition of cleansers such as metal salts. Wooden pegs were placed in alignments along the interior walls of the vat, presumably to keep the hides in motion (Figure 9) (The Moser Leather Company 2012).

According to *Dictionary of Occupational Titles*, the vats would have been tended by workers such as the tanning-drum operator, drum attendant, or continuous rotary drum tanner (U.S. Department of Labor et al. 1991). Other names for these positions include quebracho tanner, tawer, temperer, wet-milling-wheel operator, and breaker-wheel operator. Metal salts, sodium formate, liming agents, deliming agents, pickling, or tanning agents may have been used in the vats. These personnel would have been responsible for the transfer of hides into the vat, addition of the appropriate mixtures, addition of the appropriate amount of steam, timing of the application, replacement of the vat door with a grate, and emptying of the liquid and the hides.

The current owner has confirmed that there are “buildings full” of tanning equipment, wooden drying racks, overhead rollers, tanning pits, and wooden drums for “stuffing” hides with oils and waxes. He has salvaged some of this equipment, but there is more remaining. These items, coupled with the well-documented processes that occurred within until a fairly recent date, may provide additional data specifically related to the material culture used in the tanning process. While the landowner has documented the site in terms of its history, operations, and products, more focused study on the artifacts themselves would be advised. In addition, there are many individuals living in the area that worked in the plant. Oral histories would be a welcome addition to the study of this industry. Additional archaeological investigation, however, while recommended to ensure there are no associated buried remains beneath graveled areas surrounding the buildings, is not expected at this time to be the most productive means of furthering study at this site. Rather, the photographic documentation of the buildings, inside and out, along with the artifacts in the possession of the landowner, would allow a more thorough understanding of the processes associated with this industry. A very deep pile of slowly decomposing leather, which was tossed over the hillside towards the large pond, is not recommended for any invasive investigation.



Figure 8. FOAS member Randy Hollis (far left) examining rotary drum vat (photos by Anne Tobbe Bader).



Figure 9. Wooden pegs on the interior of the rotary drum vat (left) (photos by Anne Tobbe Bader).

Site 12 Fl 117 and Site 12 Fl 118

Two nearby and potentially related—but very different—sites were also identified on the upper terrace, away from the tannery. These were situated along the railroad, which is now part of the Ohio River Greenway trail. The function of these sites was not ascertained during the study, but it appears increasingly possible they were related to the railroad. Research has not resulted in the identification of any other buildings or structures in proximity to the sites. Considering their location along the rail line, and a nearby set of sidings or switches, it seems likely the sites served to provide maintenance or services to the railroad as it crossed into Floyd County.

12 Fl 117—Industrial Site

Site 12 Fl 117 was first identified through the ground surface inspection. Structural remains were evident beneath dense vegetation. These remains consisted primarily of square concrete pillars or posts surrounding a rectangular depression that could be a cellar or sub-floor. Based on the distribution of surface evidence, the site measures 45 meters by 30 meters and encompassed 0.25 acres (0.10 hectares) (Figure 10). At first, the concrete posts were thought to have been horizontal footers for a former building. These were lying prone on the ground in what appeared to be a rectangular fashion adjacent to the depression, although at least two of the posts were upright (Figure 11). An examination of the posts indicated, however, that they had stood vertically. Differences were noted in the lower 6 inches of the posts that indicated the lower

portion had been poured while in a vertical position. There appeared to be larger pebble inclusions at the base, suggesting that perhaps the heavier pieces of rock contained within the concrete had settled. Differences in coloring were attributable to the lower portion being buried in the ground. From the tops of the posts extended iron rebar that indicated a means of connection to another component of the structure, perhaps a wooden or cinder block frame. From these observations, it was concluded that this construction was not typical of a residential building, but perhaps one with a specific function.

Other structural remains identified at the site included a small square brick chimney that had fallen and concrete cinder blocks. A second, smaller but deep depression was noted east of the structural remains. The depression was roughly 1 x 2 meters in size and of an unknown depth. Of interest, a large pile of reduced coal, cinders, and/or clinker was found on the hillside adjacent to the former railroad bed above the structural depression (Figure 12).

A series of shovel probes was excavated to recover artifacts that might indicate the function of the structure and provide information on the integrity of the site. Each of the shovel probes was positive for cultural remains. In addition, artifacts were observed in the ground surface surrounding the two depressions. In all, 182 artifacts were collected from this site.

Kitchen-related artifacts were present in small numbers, but the ceramics were predominantly undecorated ironstone and stoneware and were utilitarian in nature. Container glass included clear, brown, and aqua examples, and included beverage containers (beer and cola). Wire nails, machine-made brick, and flat window glass represented the architectural elements. Unidentifiable metal artifacts were common, although an iron stove grating was among these. The proportions of functional groups represented by artifacts recovered from site 12 Fl 117 indicate a pattern which is not typical of residential sites in which architecture and kitchen artifacts are fairly evenly represented. Instead, nearly a third of the artifacts were associated with miscellaneous activities group, reflecting the high frequencies of flat metal artifacts recovered from the site.

Dates derived for diagnostic artifacts recovered from site 12 Fl 117 indicate a period of use from 1869 through 1920. The earlier Mean Ceramic Date (MCD) appears to be influenced by the early brown transferprint date (1829 to 1839 maximum popularity range) (Stelle 2001). Although some patterns were made through the late nineteenth century, without knowing the pattern or manufacturer, the maximum popularity range appears to most appropriate. The transferprinted vessel may have been a curated heirloom item. Window glass dates derived using the Moir formula indicate a date of 1913-1914. The early twentieth century dates appear to be most appropriate for the site.

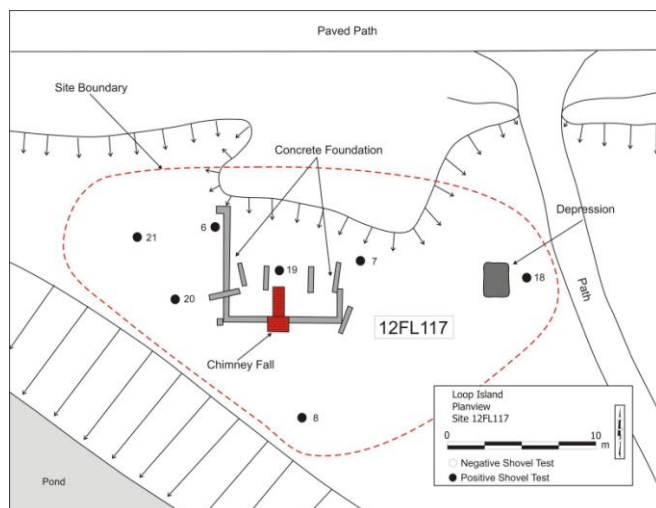


Figure 10. Detail of remains at site 12 Fl 117 (planview by David Schatz, Corn Island Archaeology LLC).



Figure 11. Concrete foundation posts (photo by Anne Tobbe Bader).



Figure 12. Cinder pile adjacent to south end of structure (photo by Anne Tobbe Bader).

USGS topographic mapping indicates only one structure on the property in 1951. A 1965 USGS (U.S. Geological Survey 1965) topographic map does not indicate any structures in the project area, but a 1964 map of the McAlpine Pool reach from the U.S. Army Corps of Engineers shows four buildings in the area. These are almost certainly the buildings identified in the field. While earlier twentieth century maps and aerial photographs do not show any buildings, the artifacts and structural debris suggest an early to mid-twentieth century occupation. Aerial photographs show a well-travelled dirt road leading from north of the tracks into the project area. Historic activity, with some alterations to the roadway, is still visible on 1963 aerial photographs.

Information provided by the landowner suggested that this site could have been the location of an early 1900s stove foundry known as the Gohmann Brothers and Kahler Company. The artifact assemblage appeared at first to bear this out, as portions of a stove were found at the site. Based on information from the county historian, the small foundry was originally thought to have been located south of the railroad line in the area. Subsequent deed and archival research by FOAS, however, revealed that the foundry was located north of the railroad, in an area that is now beneath the Ohio River floodwall.

It appears more likely that the remains present at site 12 Fl 117, as well as site 12 Fl 118 (described below) may have been related to the Pennsylvania Railroad. This is explored further in the concluding comments of this article.

Site 12 Fl 118 - Historic Residence

Site 12 Fl 118 was located south, east, and slightly downhill of site 12 Fl 117. The site was identified as two concentrations of demolished structures and debris (dressed limestone blocks, concrete, fence posts depressions), and artifact scatters. At least two possible structures were apparent. The first, Structure 1, was situated on a slight rise or terrace while Structure 2, located further to the east, was on a lower landform at the base of the terrace beyond which the ground dropped dramatically into the wetlands of the floodplain below. Push piles were present in the location of Structure 2, reflecting demolition. Ground disturbance was noted in the area of the lower structure (Figure 13). The site measured 50 meters by 30 meters and encompassed 0.25 acres (0.10 hectares).

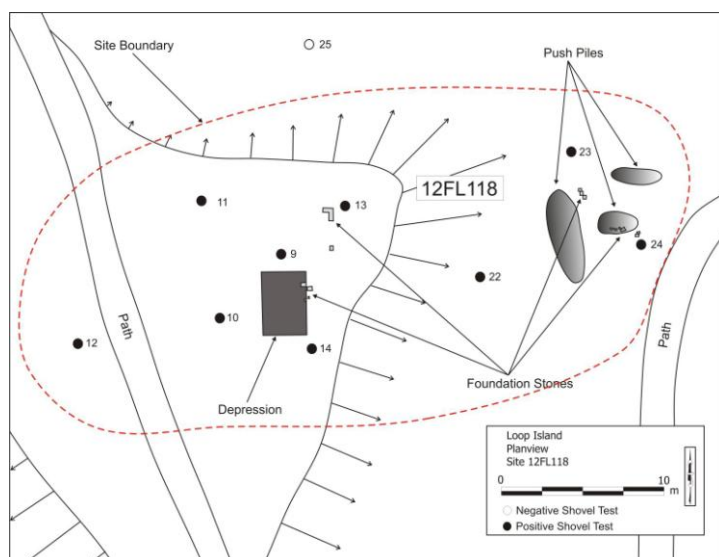


Figure 13. Detail of remains at site 12 Fl 118 (planview by David Schatz, Corn Island Archaeology LLC).

Shovel probing was undertaken to recover artifacts that would provide information on the functions of the two structures and to determine if the demolition of the buildings had disturbed all of the underlying soil deposits. It was concluded that the ground around Structure 1 was undisturbed, while only areas of the ground around Structure 2 were intact.

All but one of the shovel probes excavated at the site was positive for artifacts. A total of 159 artifacts were recovered. As at site 12 Fl 117, the artifacts recovered from this site were architectural, kitchen, and other functional types. The site yielded domestic-related items such as kitchen ceramics and container glass. The ceramics of site 12 Fl 118 included more refined and decorated tablewares as opposed to the utilitarian and storage vessels of site 12 Fl 117. Flow blue pearlware (1840-1860) and transferprinted (1829-1839) examples were recovered in addition to undecorated ceramics. Vessel forms that were recognized were plates and a teacup. Pieces of embossed container glass and chimney lamp fragments were among the assemblage. A porcelain doll fragment was also found. Plaster, brick, large bolts, and fittings also came from this structure. In contrast, the smaller structure, Structure 2, produced a small amount of miscellaneous items such as flat glass fragments (n=52) with thicknesses over 3 millimeters. Although routinely classed as furnishings artifacts, these shards could have been associated with industry. Based on the artifact sub-assemblages obtained from the two structures, it appears Structure 1 was a residential structure that was likely frame. The number of activities-related artifacts at this site was less than 10 percent, and kitchen and architecture artifacts were fairly equally represented and comprised the majority of the recovered assemblage. Structure 2 yielded a more narrow range of artifact functional types. It was interpreted as an outbuilding, possibly a garage, based on the large flat slabs of concrete distributed there.

Dates derived for diagnostic artifacts indicate the site was occupied from the late nineteenth century to the early half of the twentieth century. The Mean Artifact Date (MAD) dates range between 1891 for Structure 1 and 1906 for Structure 2. Moir dates, from which the mean manufacture date of flat glass is derived from its thickness (Moir 1987:78), reflect early twentieth century occupation of the site. Dates extended between 1910 and 1941; Structure 1 produced slightly earlier median dates than Structure 2. This contrasts with dates derived for the diagnostic ceramics recovered from the two structures for which a date of 1863 is derived for Structure 2 and a date of 1880 is derived for Structure 1. These dates, however, may be skewed by the small sample size (three and six, respectively) and the curation of ceramic dishes compared to other diagnostic material.

No confident correlation between the material remains from sites 12 Fl 117 and 118 has yet been made, but it appears they are related. They date to the same time period, and are located in proximity to one another. While the remains at site 12 Fl 117 appear to be industrial, those at site 12 Fl 118 are clearly residential. It is suggested here that the latter site reflects the residence of staff who worked in the former. Considering the presence of a doll, it is likely the family of the staff occupied the site.

It is suggested here that the buildings and structures identified at sites 12 Fl 117 and 12 Fl 118 were associated with the railroad industry. Historically, a number of buildings and structures of various functions have been located along rail lines. These included watchman towers and shanties, section houses (tool houses and handcar houses), signal towers, ash pits and sand houses, oil storage and oil mixing houses, water and coaling stations, engine and freight houses, platforms and platform sheds, and depots (Berg 1893). Of potential relevance to this study, there were also dwelling houses, and sleeping quarters and club houses for employees. While several of these options may be ruled out by the archaeological remains identified at these two sites,

others of this list could be potential matches. Several of the building types stressed the importance of fire-resistant construction materials and the use of poured concrete in the foundations and lower floors. Several others are located along sloping hillsides adjacent to the tracks, similar to the remains found at site 12 Fl 117. The large coal/ash/cinder pit located on the hillside north of site 12 Fl 117 is suggestive of a coaling station as described by Berg (Berg 1893). Blacksmith shops and small foundries were also common (McVarish 2008). Very detailed floorplans and construction techniques and materials are provided in several essential reference books (Berg 1893; McVarish 2008). Equipped with these references, it may be possible to potentially identify the functions of these buildings with additional archaeological fieldwork.

Rail Company History

Two railroad lines extend across the area. These are identified on mid-century USGS (USGS 1939, 1946, 1951, 1955) topographic maps as the Baltimore and Ohio (B&O) to the north and the Pennsylvania Railroad (PRR or Pennsy) to the south in the project area. The lines had their origins in smaller companies which eventually merged and were bought out by much larger ones (Kramer 2007:177-178). The 1867 PRR bridge possibly associated with site 12 Fl 117 and 12 Fl 118 fell under the purview of the following railroad companies (Kramer 2001a; 2001b; 2007; Meints 2011; Pennsylvania Railroad Company 1872):

1866-1890	Jeffersonville, Madison and Indianapolis Railroad (JM&I RR)
1890-1921	Pittsburgh, Cincinnati, Chicago and St. Louis Railroad (PCC&STL RR or Pan Handle Route of Pennsylvania Railroad)
1921-1968	Pennsylvania Railroad (PRR or Pennsy)
1968-1970	Penn Central
1970-	Conrail

The state of Indiana first chartered railroads in 1830 (Schotter 1927). The Ohio and Indianapolis Railroad (later the Jeffersonville Railroad) was chartered in 1832 to build a line from the capital to the Ohio River, but nothing came of it. In 1836, Governor Noah Noble signed the Internal Improvements bill with provisions for canals, turnpikes, and the Madison and Lafayette Railroad Company, and by 1847, the Madison & Indianapolis Railroad Company (M&I) completed it. Due to intense competition between the cities of Madison and Jeffersonville, the latter made haste to incorporate the Jeffersonville Railroad in 1849 and complete it in 1852 to Columbus, where it shared a track with the M&I to Indianapolis. Maps from this decade still illustrate the New Albany and Jeffersonville Plank Road where the PRR bridge stands today (Coverdale and Colpitts 1947; M&H Architecture 2007; O'Beirne and Company 1859; Sulzer 1970; Wilson 1854).

In 1866, the two rivals, the Jeffersonville Railroad and M&I merged to form the Jeffersonville, Madison and Indianapolis Railroad (JM&I) and began a series of improvements and expansion. In 1867, the company completed a commuter line on the bed of the New Albany and Jeffersonville Plank Road and called it the "Dinky" because it used a small engine. Also in this decade, the JM&I and the Louisville and Nashville (L&N) became primary stockholders in an ongoing effort to build a bridge to Louisville. In 1870, the Louisville Bridge was completed as the longest iron bridge in America with the Dinky becoming a spur that connected commuters to Louisville (Kramer 2007:177; Pennsylvania Railroad Company 1872).

In 1873, JM&I leased their line to the Pittsburgh, Cincinnati and St. Louis (PC&STL), owned by the PRR. By 1890, JM&I, PC&STL, Cincinnati and Richmond Railroad merged to form the PCC&STL RR or the Pan Handle Route of the PRR. In 1921, the PRR Company leased PCC&STL and eventually bought it out entirely in 1956. PRR continued its operation in one form or another until 1968 when it merged with the New York Central Railroad to form Penn Central. Penn Central declared bankruptcy within two years, leaving the line to Conrail's management (Coverdale and Colpitts 1947; Kramer 2007; Meints 2011; Pennsylvania Railroad Company 1872; Schotter 1927).

Another important cultural resource within the project area is the abandoned railroad bridge. The PRR bridge is still standing (Figure 14). It has an 1867 stone substructure and a circa 1900 metal truss superstructure. The substructure consists of two rectangular piers with truss bearing seats on the east and west side of Silver Creek and is built of quarry-faced, square-cut, native stone laid in regular courses. The piers do not have wingwalls or decorative elements. The superstructure is a Warren deck truss with verticals. It spans 82 feet and has a total length of 218 feet with a ten foot- wide deck according to Bridgehunters.com (Baughn and Contributors 2012). A parallel deck has been removed. Warren deck truss construction is described as follows:

The most common truss type used in the twentieth century was the Warren truss. This truss, patented in 1848 by two British engineers, eliminated verticals found in most other truss forms, using diagonals to withstand both tensile and compressive forces. Warren trusses can include verticals, but they serve more as bracing units than load-bearing systems. The span of this truss configuration generally ranged from 50 to 400 feet. Warren trusses were popular in the early twentieth century and were frequently used in Indiana once bolts and rivets supplanted pins as the preferred connection for structural members. In Indiana, the Warren truss was frequently used in a pony configuration; Warren through and deck trusses are rare [M&H Architecture 2007:75].



Figure 14. Nineteenth century railroad bridge at Loop Island Wetlands (photo by Anne Tobbe Bader).

Conclusions

Considering the archaeological richness of the Falls of the Ohio River region, especially in the immediate project vicinity, the findings of the Loop Island Wetlands survey did not meet original expectations. Overall, the ground within the project area was found to be very much disturbed. Evidence of earth movement through construction and building demolition as well as erosion were commonplace. The disturbance, however, while widespread horizontally across the project area, was confined to the near surface. Exceptions include the small lagoon in which acres of soil had been excavated to a depth of five to six feet for borrow during its creation. Shovel probing was an impractical method of site discovery except on the upper terrace. The geomorphological assessment (Haywood 2012) documented several meters of alluvium overlying former ground surfaces in the southern portions of the study area. Severe erosion and scouring along the Ohio River have also resulted in loss of land along the riverbanks. These deep deposits of recent alluvium that blanket the southern portion of the project area may conceal buried archaeological sites that could not be accessed by the methodologies of this survey.

Yet among, and possibly beneath, the observed disturbances lie pockets of ground that contain archaeological sites. Of the four sites documented in this survey, site 12 Fl 119, the Moser Leather Company Complex, consisting of a series of standing buildings, is surrounded by the built environment. Thanks to the landowner, this site is well documented in terms of its history, operations, and products. Although this site is well documented in regards to the industrial processes that occurred at the location, a comprehensive artifact inventory is not currently available. It is difficult, however, to form expectations on the archaeological value of the site. There is very little available ground in which to conduct archaeology. Beneath the pavement and gravel there may lie buried artifacts and midden. Pavement and gravel lots precluded shovel probing, and artifact recovery was low. It would seem logical to expect that most of the activities at this complex occurred within the buildings themselves, leaving little potential for meaningful data to be gathered through excavation. An examination of the interior of the buildings, coupled with the well documented processes that occurred within until a fairly recent date, may provide additional data specifically related to the material culture (tools, machinery, etc.) used in the tanning process. Since there are plans to rehabilitate the buildings into a housing complex, the window of opportunity for doing this may be running out. Additional archaeological investigation, however, is not necessarily considered to be a productive means of studying this site.

Site 12 Fl 117 was comprised of the material remains of an industrial building, and a second depression that may indicate a second structure or specialized activity. Based on its apparent age, the buildings were present during George Moser's ownership and occupation of the property, although they do not appear to have been directly involved in the business of the Moser Leather Company. While the precise nature of the work conducted at the site was not determined during the survey, artifact patterning clearly suggests the building was not residential. Furthermore, the method of construction of the building was not typical of a residential building. Concrete pillars may have been piers to support a superstructure of the building that was situated on the hillside. The very large pile of cinders and clinkers also indicates the building was the site of some industrial process that involved burning or reduction of coal, or perhaps the disposal of clinkers, perhaps a clean-out from the railroad. Additional field research is needed to learn more about this building.

Nearby, at site 12 Fl 118, the pattern of artifact functional groups indicates a typical residential building. A residential structure—presumably frame—was identified, along with another building of unknown function. While site 12 Fl 118 may have been occupied by workers or care tender of the industrial site, it is suspected that the family of the worker/care tender may also have resided here, as evidenced by the broken ceramic doll. Of the two structures noted at this location, the upper western structure appears to have been the residence, while the structure on the lower may have been a supporting building, such as a shed or garage, although a specialty workshop cannot be ruled out.

Of the four sites documented in this project, sites 12 Fl 117 and 12 Fl 118 offer perhaps the best opportunity to acquire significant information relative to the early to mid-twentieth century use of the property. Both sites contain the remnants of former structures, largely undisturbed surrounding ground, and associated buried artifacts. These sites warrant at least additional archival research and, as the opportunity presents, additional fieldwork. If possible, the sites should remain undisturbed and avoided by any planned future use of the property pending future studies.

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CONTROL OF THEIR BODIES, CONTROL OF THEIR VOTES: PINS AND PROPHYLACTICS TELL THE SUFFRAGETTE STORY

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Introduction

The study of material culture regularly provides insight into the lives of working-class and ethnically diverse people, groups for whom documentary information is often found lacking. The objects found in their places of work or near the households in which they lived can help illuminate their daily concerns and affairs. These are topics not regularly discussed in the historical record and, as such, are explored through historical archaeology instead. Likewise, there are important issues taking place both within the home and in wider society that are not openly addressed in newspapers, novels, or governmental records. For instance, because they are seen as taboo, sexual relations are often kept under cover. Yet, the interpretation of specific classes of artifacts related to marital (and extramarital) practices can provide a possible reconstruction of the social lives of those that used them. The political dynamics of an era also influences the ways in which members of all gender present themselves (and are represented) in the public sphere.

Policies regarding sexual practices and politics were not in the initial research design of a recent excavation in South Bend, Indiana. Students participating in the Indiana University South Bend Historic Archaeology field season during the summer of 2010 were more interested in learning about the local community. One of the sites investigated was in the West Washington National Historic District, in the vicinity of Copshaholm, built by the Oliver family, prominent citizens who made their fortune in cold rolled steel plows (Historic Preservation Commission 2008). The lot, now a vacant grassy field, was once the site of a duplex house and a drug store, both of which were eventually razed by the Oliver family, and backfilled with the assistance of the Studebaker family (David Bainbridge, personal communication, 2010). Like the Olivers, the Studebakers were considered leaders of the city around the turn of the 20th century. There are a number of large ornate houses still standing in the neighborhood, signifying the importance and wealth of the people who lived in this area (Historic Preservation Commission 2008).

Due to the money put into the construction of these structures, it is logical they were insured against fire. There are a number of maps of the neighborhood compiled by the Sanborn Company to assess damage liability, and they provide structural details and describe building use patterns over many decades (Figure 1). The duplex, in the east portion of the study area, and the drug store to its immediate west appear to have been built between 1875 and 1891. A record of druggists in the area list George E. Cimmerman as operating a business there from 1893 to between 1906 and 1911 (Haynes & Co. 1916). The drug store disappears from the 1917 map,

leaving only duplex on the lot. David Bainbridge, Senior Curator for the Center for History, indicates that the Oliver family decided to clear the property completely in the 1930s (personal communication, 2010). Maps from 1949 on support this information, showing the lot as vacant. Further, although the soil in the excavation units did not show a clear stratigraphy, it was evident that the site had not been significantly disturbed since being backfilled. Therefore, the artifacts, with few exceptions, were most likely used and ultimately deposited before the end of the 1930s.

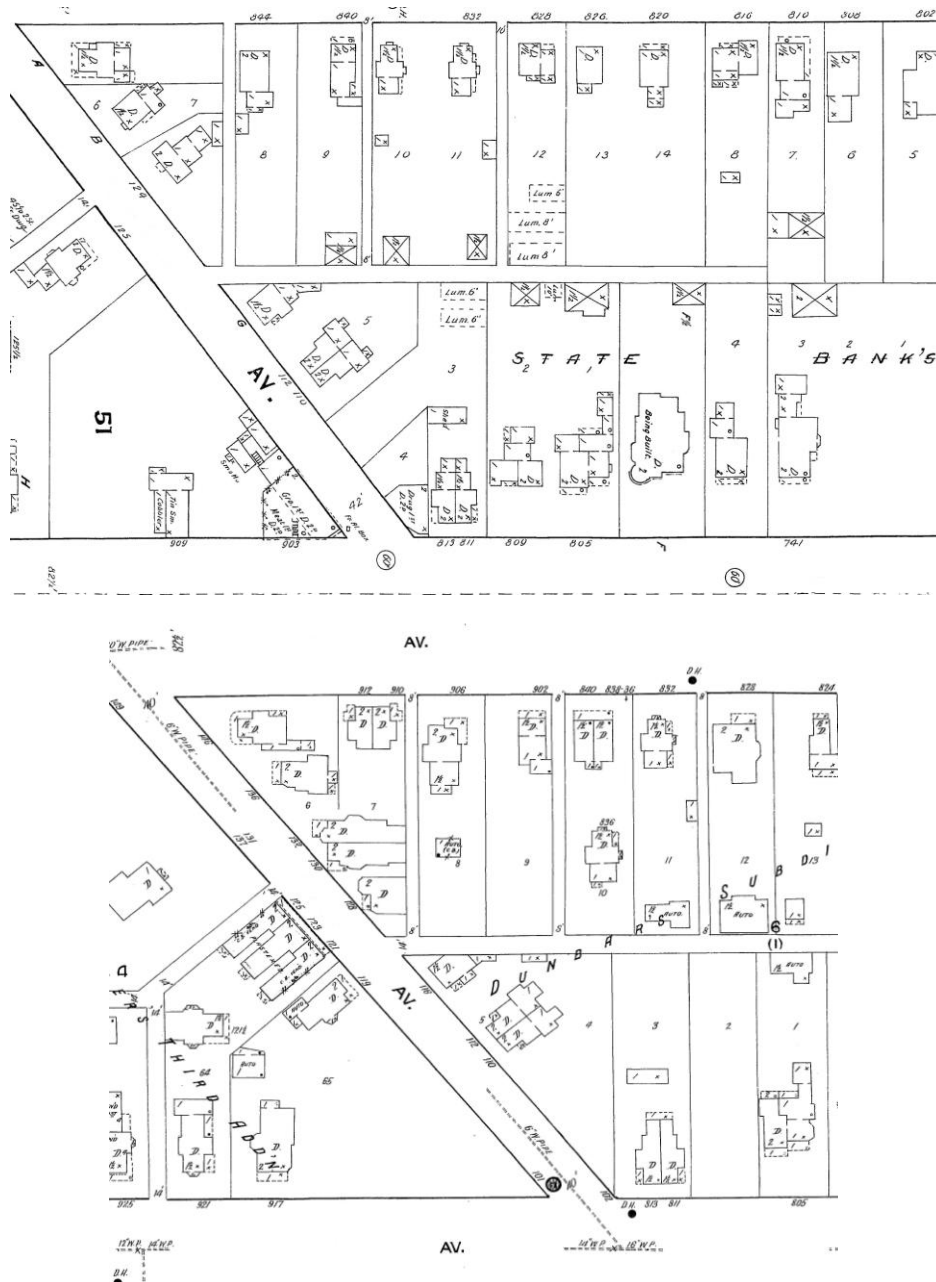


Figure 1. Sanborn maps (modified) showing the general area containing the property in 1891 (top) and 1917 (bottom).

The lot extends just less than 60m from the street north to an alley, and the street frontage is 13m from east to west. The original locations of the buildings were on the southern portion of the lot, just off the street. A total of nine 1m x 1m units were opened across the property, positioned to best investigate the deposition patterns predicted to have occurred around both structures. The units averaged about 100cm in depth, below the ground surface, before culturally sterile soil was reached. One unit was excavated to a depth of 125cm below surface and still yielded cultural material. This appears to have been a brick lined privy. An additional 50cm x 50cm unit was excavated adjacent to the larger hole so as to examine the courses of bricks and determine the presence of stratigraphy outside the privy. Excavation in both units was eventually halted due to safety concerns resulting from the depth and to protect the brick present. As was expected, the artifacts recovered around the site ranged from structural material (nails, window glass, floor tiles) to domestic objects (ceramic plates and containers, beer bottles, children's toys) to sundry items related to the drug store (medicine bottles, cosmetics). Among the more unique artifacts, however, were a hat pin with symbolic paste jewels and an aluminum tin holding condoms.

Hatpin: "When attacked from behind she grasps a hatpin turning quickly"

While the use of flat or shaped metal pins to hold back hair or attach decorative elements to hats and other head coverings began in the fifteenth century (Baker 1998), the decorative hatpin reached its apex of use in the late 19th century with the shift of style away from flat bonnets (popular in the mid-1800s) to hats that rested on hair piled high on the head. It was at this point that the length of hat pins grew to an excess of over a foot in length, sometimes approaching 20 inches. Additionally, due to the industrialization of the West, the long steel shaft of the pin was able to be mass-produced, which made the hatpin an easily affordable item for the fashionable woman and a requirement for everyday wear (Baker 1998). Between approximately 1880 and 1920, after which the bobbed haircut of the flappers rendered hatpins superfluous, the hatpin was both in vogue, and was a necessary accompaniment to a woman's long locks and high hairstyles.

However, the hatpin had certain other uses which connected it to the suffrage movement, in both the United Kingdom, and the United States. With the mass production, and inexpensive cost of the pins, women from every class could access this resource. At a penny for five (Baker 1998), even the poorest of women could afford to buy pins. Suffrage was also a topic that crossed class lines, and women united to fight for rights equaling those of men. One reason for this was that equal access to employment was a poor women's issue, and as the right to vote was paramount for all other rights, women came together to fight for it. However, even as some laws fell, such as those preventing access to literature about birth control (which were repealed in 1877) (Chandrasekhar 1981), others were enacted regarding, of all things, the hatpin.

From Europe to the U.S., lawmakers created restrictions on the wearing, use, and length of hatpins. No longer could women wear their pins at upwards of a foot. In many states across the U.S., the length was restricted to nine or ten inches. The reason for this restriction was the danger to men from women's uncontrolled use of their hatpins as weapons (Figure 2). An article in the *Evening World News* paper, of February 1, 1909, states that new Oregon legislation requires the length of hatpins to be confined to 10 inches. Below the caricatured pictures sits the caption: "Why not safety pins, if pins there must be?" (Figure 3). One year later, a Chicago city

ordinance was first defeated, and then successfully passed, regulating the length of the pins. During each hearing of the bill, boos, hisses, and shouts of “Shame!” were heard from the women in the gallery, reports *The New York Tribune* (1910:1).

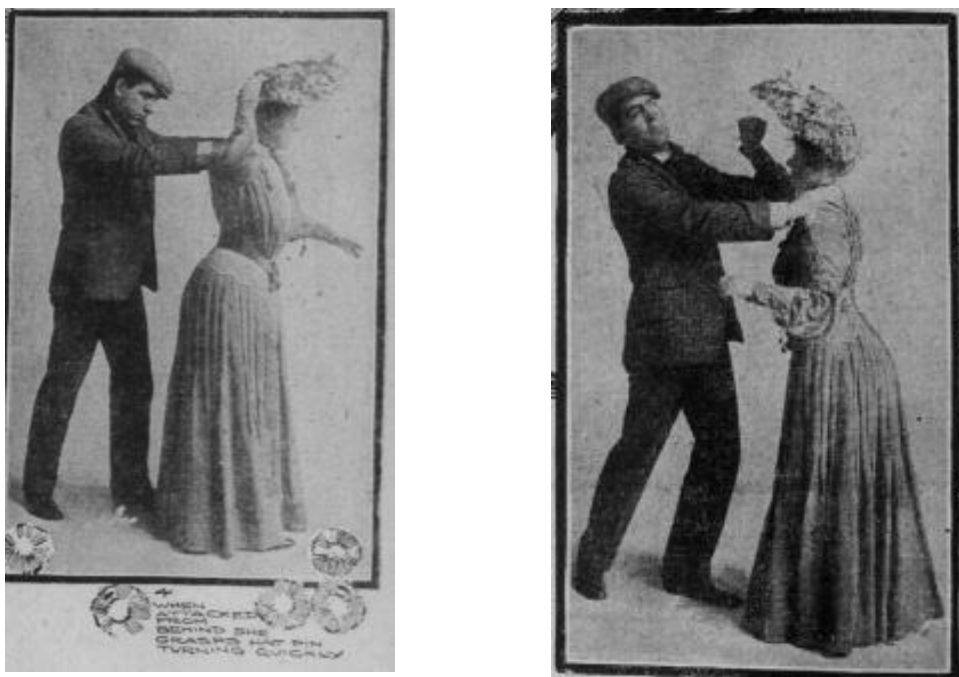


Figure 2. Illustration of defense maneuver using a hatpin (from the *San Francisco Call*, 21 August 1904).



Figure 3. Illustration of “unsafe” hatpins (*San Francisco Call*, 15 January 1904).

Furthermore, the male public cried out against the wearing of “the deadly hatpin” (Wales 1910:11) and the female public rebutted with the headline “Length of hatpins is none of men’s business” (Salt Lake Herald-Republican 1910:2). The debate was not simply idyllic, either--women did indeed stab people with their hatpins accidentally, or, sometimes, on purpose. Articles of the time report on violence involving the ornamental jewelry. One woman was said to have been overcome with grief and anger at a former lover, for example. In court for her own hearing, accused of shooting him, she became swept away by “the hot blood of her mountain forebears [which] leaped in her veins. She lost sight of the eager faces about her, of the judge and attaches of the court, and snatching a long pin from her hat she sprang at the man” (Los Angeles Herald 1910:14) This article shows not only the stereotypes of the day, but also the public’s fear of a woman with a weapon.

This fear surfaced in other writing as well. A short article in the Princeton Union (1911) reports that a vaudevillian was stabbed through the eye by the hatpin of a woman, who then became offended that he dared accost her hat. Yet another woman was arrested and “fined 36 cents, with the alternative of 12 hours in jail,” in Vienna, Austria (Tacoma Times 1911:6). Both these articles, however, and much of the preceding documentation, feel somewhat hysterical--the writings of men who did not wish for women to get above their place in life, or to exercise their rights. The report from Vienna states:

The first arrest under the new hatpin law has been made, and the prisoner, a young woman, will carry the case, to the highest court of Austria. A mere rude man walking along the Prater was scratched by the hatpin of a girl who passed him on the street. He seized Gretchen and took her to the nearest policeman [Tacoma Times 1911:6].

This seems less like a woman with murderous intent, and more like a man offended by a woman who rebuffed his closely pressed advances. A way to return her scorn was to have her punished under the new hatpin laws. Viewing this documentary evidence gives a clearer understanding of the social milieu in which the hatpin at the West Washington site was created, used, and then discarded.

A pin was found in Unit E, the fifth unit opened at the site. This unit is a brick privy or well to the rear of what used to be the duplex house on the property. The unit was excavated to 12 and a half levels, or 125 centimeters, and the hatpin was found in level 6, between 50 and 60 centimeters below our data point. The piece has no maker’s mark, and the shaft is missing; however, one can clearly see an elongated, bulbous base typical of the styles of the early 20th century (Baker 1983; Baker and Hammell 1981; Cox 2010; LaBarre and LaBarre 2006; Leshner 2002, 2008; Leshner and Romero 1992), which supports an open realistic bouquet of three flowers. The flowers contained pastework gems, and the two flowers that still contain their gems are colored green and violet (Figure 4).

Again, although the soil in the unit did not show a clear stratigraphy, it was evident that it had not been disturbed since being backfilled. Therefore, the artifacts in level six were most certainly deposited before the end of the 1930s. Discussion with Jared Cilley of Small Pleasures jewelry store in Boston (personal communication, 2011) revealed that the hatpin is in the style of the Arts and Crafts movement, which was strongest between 1860 and 1910, and which continued to influence styles until the early 1930s. Cilley also confirmed that the hatpin was non-reactive to the 10 karat gold test, but is gold plated. This led him to conclude that the pin is nine

karat gold plated, a common practice of British jewelers of the time. Thus, the pin can confidently be dated between the late 1890s and the early 1930s, with a likely date being the period between 1891 and 1920.



Figure 4. Two views of hatpin found in excavation unit at the site (photos by Rebecca Gibson).

What interested us first about the hatpin are the two paste jewels and the space for a third. As mentioned earlier, the two that survived are green and violet. The authors posit that the third was white or clear. If so, the three colors together symbolize the English suffragists, specifically the Women’s Social and Political Union. This union, and the women who spoke for it, were committed to active participation in the fight for women’s rights and adopted the three colors as their symbol in 1908 because, “purple . . . stands for the royal blood that flows in the veins of every suffragette . . . white stands for purity in private and public life . . . green is the colour of hope and the emblem of spring” (Emmeline Pethick-Lawrence, quoted in the Museum of Edinburgh Votes for Women Exhibition 2009).

Once these colors were decided on, they began to occur in all facets of the Women’s Movement from postcards to jewelry and soon, to a limited extent, migrated across the Atlantic to America, where in some cases they were combined with the American suffragette colors. This can be seen in several examples, among them a watch from the 1920s with the words “Vote For Women” replacing the numbers on the watch face (Figure 5). The letters are violet, and there is a yellow rose with green foliage centered on the face. Additionally, certain postcards of the day combine the colors and phrase, so that the symbolism was clear to suffrage supporters, American and British alike.

Many people confuse the colors with the phrase “Give Votes to Women,” noting the colors green, violet, and white can be used as a code when the phrase itself cannot be uttered; however, historically, these two concepts lack conflation and from the Pankhurst’s own words, the colors began with the Women’s Social and Political Union (Bartley 2002). They did, however, come to stand for the general fight for women’s rights in both England and America.



Figure 5. Suffragette watch, now owned by R. Gibson (photo by Rebecca Gibson).

Winston Churchill famously said that England and America mutually benefited from their “special relationship,” a sort of agreement that both countries stood for Western democracy, freedom from socialist and communist tyranny, and that both countries shared ideas on trade and manufacturing (Churchill 1946). Although he did not say these words until 1946, the relationship began far before that time, and where one country went in politics, trade, or expansion, the other was soon to follow. The same was very much true regarding suffrage. With the American Seneca Falls Convention in 1848, and the British National Union of Women’s Suffrage Societies formed in 1897, both countries organized themselves within mere decades of each other. Additionally, many delegates at Seneca Falls would go on to befriend, and assist, the leaders of the British movement (Holton 1994). Women in several states in America already had the vote, before Seneca. Eventually, America passed the 19th amendment to its constitution in 1920, while the United Kingdom passed the Representation of the People Act in 1928.

Why would an English suffragist hatpin be in the possession of an American family with few known ties to England and no demonstrable history of feminist activism? A look through the records of the Indiana Board of Directors of the League of Women Voters (1923) shows that the wives of the leaders of local industry in South Bend and the neighboring city of Elkhart participated fully and enthusiastically in feminist activities. They were integral in pushing for the adoption of temperance reforms, for insisting that the female perspective be heard in order that it

may balance the male, and benefiting from their husbands' money and influence, they had the means to make their voices heard.

During the years immediately before and after the ratification of the 19th amendment, the League of Women Voters had a strong presence in Elkhart and South Bend. The Women's Franchise League, which preceded the League of Women Voters, held its first area meetings in Beardsley House, the home of one of the founding families of Elkhart, currently under archaeological excavation by Indiana University South Bend, under the direction of James VanderVeen. The Women's Franchise League wielded great amounts of power, asking important questions and raising delicate issues about the role of women in Indiana society. In their by-laws they state, "Does not Indiana need the intelligence and ability of her women to keep abreast in the progressing civilization, to meet the difficulties of industry and over-population which Indiana must face in the near future, and to keep awake the women themselves?" (Yearbook of the Women's Franchise League 1915:11). These questions they backed up with hard facts. The text noted that already eleven U.S. states and the countries of Norway, Finland, Australia, Iceland, and New Zealand gave women the right to vote. Furthermore, they list pauperism, illiteracy, and idleness among educated women as ills that needed the vote as a cure (Yearbook of the Women's Franchise League 1915).

In 1919, Mrs. Charles (Maria) Byers was the South Bend delegate on the state election board for the League of Women Voters. In 1922, Anne Studebaker Carlisle was the Vice President of the state League. Her husband was in the management of the Studebaker automobile company. And in 1924, Mrs. L. S. (Rosie) Fickenscher was the League's South Bend District Director (Indiana Board of Directors of the League of Women's Voters 1923). These three women lived within walking distance of the property under investigation, and two of them would have had regular contact with the Oliver family. A search of the Polk directory for 1921 shows that L. S. Fickenscher managed the laboratory of the area's petroleum refinery (Polk & Co. 1921). As the Oliver and Studebaker plants would have relied on the petroleum for kerosene and other fuel oils, they would have done business regularly with Fickenscher. Additionally, Anne Carlisle was one of the daughters of the Studebaker family, and her husband helped manage the factory. Charles and Maria Byers owned their own home, and rented a room to one of Charles' relatives (Polk & Co. 1921).

It is the relative wealth of the area, and of the women involved in the lives of the Olivers and Studebakers, along with the local activity of the Women's Franchise League and, later, the League of Women Voters, that makes us conclude that this hatpin had been owned by a well off woman, involved in the suffrage movement. While hatpins were ubiquitous, this one shows both intricacy of crafting and the use of expensive materials. According to hatpin experts, Eve Eckstein and June Firkins, "Plain glass pins could be bought for a penny each" and were ubiquitous (Eckstein and Firkins 2008:10). Something as ornate and stylized as our artifact would have most likely been a special order and would have cost upwards of ten shillings in 1904 (the only known date for which there are comparative monetary figures) which translates to twenty one pounds, fifty pence, or thirty four dollars American, in 2010.

While one argument against this conclusion can be that the American suffrage movement used different colors for their flags and banners, it is inarguable that the three colors, green, violet, and white, were used to symbolize the fight for women's rights, and that they entered into the overall symbolism of the movement. In these postcards from 1909, the colors are seen in relation to cats. This is a pun on the name of one of the most influential American activists for the 19th amendment, Carrie Chapman Catt (Figure 6). This, combined with the connection of

the land to the Olivers, as owners, and the Studebakers, who both had access to the land, supports the conclusion that this pin was either lost into the privy at some point before the site was backfilled, or that it broke or lost its third jewel and was deliberately discarded for use as part of the backfill for the site.

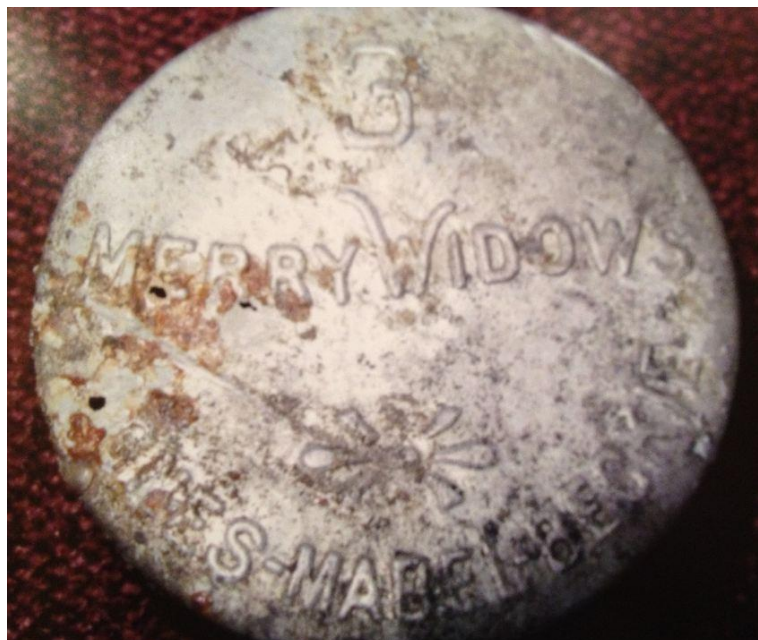
Figure 6. Reproduction of suffragette postcard showing a cat, or Carrie Chapman Catt, owned by R. Gibson.



Condom tin: “Crossing Your Fingers Won’t Prevent Venereal Disease – But a Prophylaxis Will”

Although the investigation area once included a drug store and the site dates to the American Progressive era (ca. 1890-1920), when the birth control movement began to flourish, the recovery of a container for condoms brought a stir. Prophylactic products continue to possess a taboo, one result of the politics surrounding that same women’s rights movement. The circular container, now empty, was small. It measures approximately 4 centimeters in diameter and 1.5 cm wide, or would were it not slightly deformed. It is made of tin with embossed decorations and wording on the top half. The tin has no hinges but is kept together through friction, with the top half sliding over the lower half to create a seal. It looks rather like a tin for aspirin, cosmetics, or even candies. The brand name stamped on the container, “3 Merry Widows” (Figure 7), gives little hint to the product intended to be inside, at least for the 21st century students who found the object.

Figure 7. Recovered condom tin, embossed with “3 Merry Widows” and “Agnes – Mabel – Beckie” (photo by James VanderVeen).



The Merry Widow brand, however, was one of the more popular versions of condoms during early 1900s (Collier 2007). The brand was known for its unique packaging: a gold colored, coin-shaped tin with three condoms made first of rubber cement and later of liquid latex tucked inside waxy wrappings. The brand was produced from before World War I to the mid-1930s and widely available. Cheaper than Trojans, a competing brand, tins of Merry Widows were sold by barbers, bartenders, shoeshine boys, gas station attendants, and even door-to-door (Collier 2007). Trojans were specifically marketed to pharmacists running corner drug stores, like the one at the site, but Merry Widows, labeled as disease preventives, were probably available there as well.

The tin was not found on the drug store portion of the plot, rather it was in the foundation of the demolished duplex. Excavated from Unit C, nearest to the street, the package could have been used by the inhabitants of the building or pushed into the foundation from nearby as backfill. It was from one of the lowest levels, 90 cm below surface, so it is unlikely to have been deposited after the property was razed in the 1930s. Still, it was remarkably well preserved for a piece of refuse almost 100 years old. It still holds a story, even with the contents now gone.

First, the presence of a marketed prophylactic device reflects the changing social relationships between the sexes in the early 20th century. The distribution of contraceptives was made illegal in the United States with the Comstock Act of 1873. Named for the anti-obscenity crusader Anthony Comstock, the bill was part of legislation controlling the distribution of any material considered lascivious through the U.S. Mail. Comstock's definition was broad enough to cover all forms of contraception and the information concerning how it was to be used. His moral crusade extended to pornography, abortion, and even general discussions of sex. The motivation behind the law may have started with Comstock's relocation to New York City after the Civil War. Comstock boarded near the infamous Tenderloin district, where pimps and prostitutes offered their services to the general public and racy newspapers and photographs were freely distributed. Condoms, as one can imagine, were peddled on the street. He took it upon himself to chase away as many of the "riff raff" as he could with an open umbrella, but Comstock could do much more after gaining the attention of magnates like Samuel Colgate and

J. Pierpont Morgan. The men, and others, worked through politics and social organizations to restore what they considered to be morality and virtue to America once again (Collier 2007).

Many prominent women in the local area shared the same determination. A strong temperance crusade was started during the 1870s in Elkhart, the next city over (Pickrell 1978). Many of the complaints addressed had to do with women of loose morals seen about town. “Girls also roamed Main Street in gangs, hung around the railroad depot, innocently flirted with strangers, [and] visited the un-respectable Pigeon Street Bridge . . . Assignment houses where young men and women could meet on the sly was one element that powered civic reform” (Pickrell 1978:7-11). The temperance crusade evolved into the Women’s Franchise League, because men were not thought to be able to handle such questions of poor women, working children, and moral questions unaided. Societal problems vitally affected the lives of women and children and needed to be addressed. By providing women with the right to vote on relevant issues, the local surroundings could be improved in ways that were, at the time, lacking.

The Comstock Act, prohibiting the distribution and discussion of material related to sex, was thus in bed (so to speak) with the suffrage movement in the United States. Both were concerned with political power stemming from the control women possessed over their bodies and choices on how those bodies were used. Other noted feminists of the time, however, did not follow suit. In England, Annie Besant and Charles Bradlaugh distributed a neo-Malthusian pamphlet on population control and contraception on the streets, and were arrested and tried for obscenity for their troubles (Chandrasekhar 1981). Margaret Sanger and Emma Goldman both toured the country lecturing on birth control during the early 1900s, directly in opposition to the laws that classified that type of discussion as obscene. Sanger left for the United Kingdom to escape prosecution, and her husband then had condoms shipped to him so as to bring the Act to court. For them, condoms shifted the responsibility for contraception from women to men. In comparison to chemical and herbal birth control options, the condom caused fewer side effects while offering more protection against sexually transmitted disease (Parisot 1985). Female methods were also seen as a drain on housekeeping money (Fisher 2006).

Condoms were openly marketed during the years of the Comstock Act by taking advantage of a loophole. If they were offered for disease prevention they could be advertised and shipped (Parisot 1985). Producers also learned to use euphemisms for their prophylactics. Using the right word, contraceptives could be sold through the Sears and Roebuck catalogs and by industry giants like Goodyear (Collier 2007). Condoms were discretely referred to as “caps” or “sheaths,” among other terms (Collier 2007:146).

Creative titles were employed as well. Especially popular were the titles “Madame,” “Widow,” and other terms women found acceptable to speak in mixed company. The 3 Merry Widows brand was marketed towards sexually savvy consumers, both women and men (Collier 2007). The name was an invitation to sexual play (Figure 8). “Proper women waited until marriage to have intercourse, making Agnes, Mabel, and Becky [the given names of the widows that often appeared embossed on the tin’s cover] legitimately experienced and, better yet, available” (Tone 2002:185). Because the euphemism merry widow was less taboo than rubber, raincoat, or protection women could ask a merchant or a lover for the item without being contaminated by association (Collier 2007; Maurer 1976). The Merry Widow packaging is even mentioned in the 1929 novel *The Sound and the Fury* by William Faulkner. A character picks up the round and shiny tin from the ground, thinking it was a coin. In an era when censorship was a constant threat, the inclusion of the condom brand in such a cavalier way suggests acceptance of the term, in addition to the popular recognition of the item.



Figure 8. Illustration depicting a tin button advertising the Merry Widow brand condom (from Elliott, et al. 1998:142).

Even while discussion of the use of such items was culturally suppressed, the items were available and widely employed. Though that word was not used in mixed company, the rate of usage was at least 40% in those married between 1910 and 1919 (Parisot 1985). Because they were included in prophylaxis kits supplied to all American sailors overseas, the use of condoms as protection against venereal disease became an accepted practice among a generation of men. Later, during the Great Depression, more than 1.5 million condoms were produced each day (Collier 2007). A product not regularly discussed and nominally illegal to distribute was now commonplace.

Yet condoms were certainly more than a prescription medicine. When U.S. soldiers returned from abroad after the First World War, they carried with memories of cultures much less puritan than our own. An interest in many things French expanded across this nation, including sexual mores. This is when the French kiss was embraced, as were French novels filled with eroticism and the bobbed hairstyle that was a “badge worn by French prostitutes, whose friendly manners and democratic behavior had been favorably noted by American soldiers” (Maurer 1976:7). One would preface saying something taboo with “excuse my French. . . .” Condoms were called French letters, and their use in loosening the sexual mores during the Jazz Age was a factor in the decrease in venereal disease rates as well as the number of prostitutes in brothels during the 1920s (Collier 2007). This was certainly not the strategy sought by those in the suffrage movement, but the effect was what many of the leaders had desired. The campaign for giving women votes was run by the same people who, at least in the South Bend area, were active in the Civic Leagues. Those organizations were a response to the “seedy element” found in urban areas, namely prostitutes (Pickrell 1978:7). Yet suffrage, and the growing feminist agenda, began in the home. Equality could not be achieved without the legal ability to control the number of children in that home, considering the time and expense associated with caring for them.

Conclusions

Sexual permissiveness followed excessive drinking from the bar to the dance floor and outside the speakeasies just before and during the Prohibition era. The 1920s were a time of major social revolution. The puritan Establishment in America was seen as a musty remnant that needed to be changed. Victorian ideas about sexual behavior and the role of the sexes were only part of the social structure under attack, but these two seemingly insignificant artifacts are evidence of the rebellion underway. Ideologies imported from Europe by the rich, and reinforced by soldiers in the aftermath of World War I, made their way into the middle class. Change also came from the other side of the tracks, carried by jazz music and vaudeville (Maurer 1976).

Change swept past state and social boundaries, moving through the U.S. and U.K. alike. The fashion for pins, the colors of the suffrage movement, and the need for women to be able to control the size of their families all coalesced at the end of the 19th century. A hatpin and condom tin give voice to this shift from older values to the new pattern of cultural manners found in the next half-century.

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HOOSIER HISTORY IN THE DEEP: SURVEY OF LAKE MICHIGAN HISTORIC SHIPWRECKS IN INDIANA’S WATERS

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The fresh water sea of Lake Michigan lures us like a mythical siren, deep into the mysteries that lie below. We are still entranced by the folklore, the history, and the adventure that shipwrecks represent. Indiana’s waters possess much more of this maritime history than is often realized and include shipwrecks that are over 100 years old, such as the Muskegon (Peerless), the F. W. Wheeler, and the J. D. Marshall. These puzzles embedded in the lake floor are not only memorials to Indiana’s maritime history, but are also archaeological resources whose true value is the potential for historical information that they contain. With funding from the National Oceanic and Atmospheric Association (NOAA), Indiana’s Lake Michigan Coastal Program (LMCP) coordinated archaeological investigations of shipwrecks in the Indiana waters of Lake Michigan during 2011 and 2012 (Figure 1). Commonwealth Cultural Resources Group, Inc. (CCRG) was contracted to perform the investigations, with oversight by the State Archaeologist and Indiana State Museums and Historic Sites (ISMHS) (Kaufmann 2011).

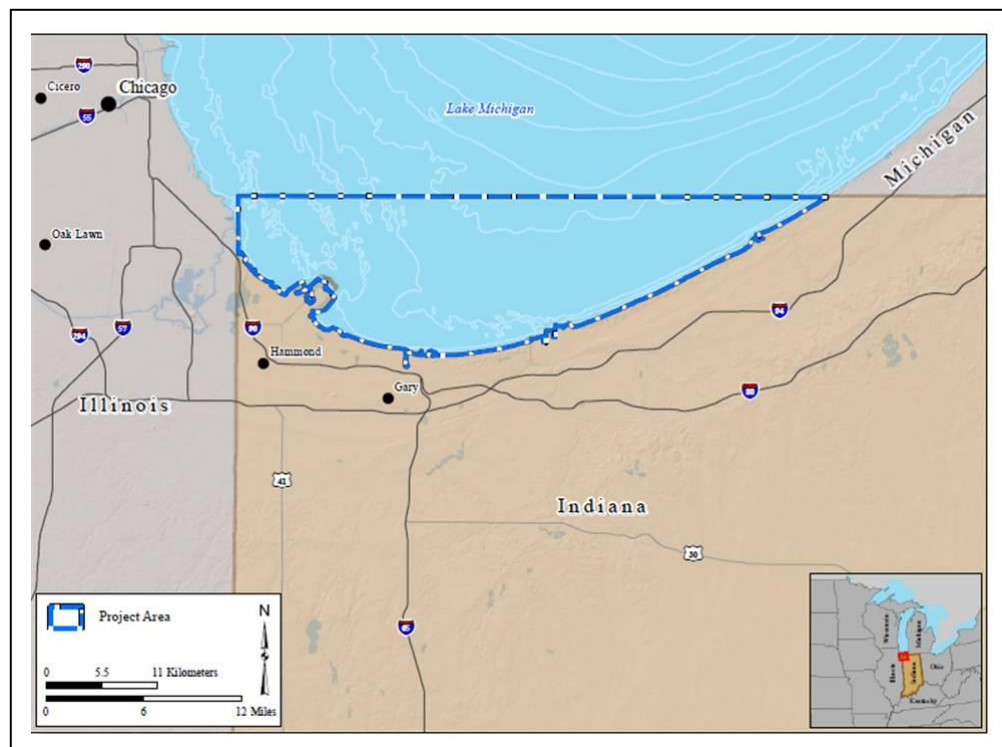


Figure 1. Indiana Lake Michigan historic shipwreck survey project area (Kaufmann 2011:8).

In the mid-1980s, the Indiana Department of Natural Resources (IDNR) and then State Archaeologist Gary Ellis undertook a survey of historic shipwrecks in Lake Michigan. In concern over shipwreck preservation and potential damage to a shipwreck site in 2006, the IDNR Lake Michigan Coastal Program (LMCP) sponsored additional archaeological research to relocate historic shipwrecks and search for previously unidentified sites in Indiana's territorial waters of Lake Michigan. The project involved historical research, archaeological survey, and public outreach. Historical background research provided new information, expanding previous knowledge of the history, anthropology, and archaeology of the nautical resources known to exist in Indiana's Lake Michigan waters. Archaeological fieldwork was conducted in July and August 2011, and August and September 2012, to locate/relocate submerged cultural resources within Indiana's Lake Michigan waters. Fieldwork utilized onshore pedestrian survey, nearshore snorkeling, offshore indirect remote sensing and direct diver survey.

As a result of this fieldwork, nine of 14 archaeological sites documented in the 1980s were relocated and additional targets were identified. The sites that were relocated were those vessels that were comparatively intact. These sites were documented with remote sensing, satellite data, photography, and/or videography. The targets that were identified appear to represent primarily wreck debris, ballast, or potentially disarticulated pieces of structure. Fieldwork established baseline information for site assessment and the potential of these resources to be listed in the National Register of Historic Places (NRHP). In addition, field results were used to develop a management plan that provides strategies for protection of the resources and guidelines that include multiple recreational uses for the resources identified. This management plan was developed in keeping with the goals of the Indiana LMCP and the Division of Historic Preservation and Archaeology (DHPA).

Environmental Context

The study area is located along the southern Lake Michigan shoreline from East Chicago to Michigan City and north to encompass Indiana's Lake Michigan waters. In Lake and Porter counties, the study area lies within an area of the Calumet Lacustrine Plain subdivision of the Northern Moraine and Lake Region physiographic division (Hartke et al. 1975:2). The physiography of this portion of Lake Michigan is a result of the Wisconsin glaciations, and the Calumet Lacustrine Plain is mostly of glacial Lake Chicago origin (Hartke et al. 1975:5). The Calumet Lacustrine Plain consists of complexly intermixed clay, sand, and silt deposits derived from glacial Lake Chicago and recent deposits from shorelines and outfall areas. Three relict shorelines capped by dune deposits are extant along the shoreline and represent the lower stages of glacial Lake Chicago (Hartke et al. 1975:6).

The lakebed deposits overlay gravel and clay ridges. These sediments are fairly level and low relief with some small undulations as a result of shifting bottom sediments. The bathymetry, or depths and bottom contours of the lake, ranges from between 60 to 80 feet [ft] (18.3 to 24.4 meters [m]) at its deepest in Indiana's territorial waters, with the bathymetry within 1 mile (mi) (1.6 kilometers [km]) of shore averaging 30 ft (9.1 m) in depth. The environment of Lake Michigan in the regions of Lake, Porter, and LaPorte counties has a sandy bottom punctuated by linear valleys and pockets (Ellis 1986b:8). There are shallow shoals, bars, ridges, and spits formed through natural water and weather action as well as human activities, such as spoil

dumping that cause elevated areas. Various areas along the shore are lined with stone rip-rap, concrete, or other shoreline erosion protection measures as well as industrial fill.

The environment of this region is characterized as highly dynamic because of the extreme weather fluctuations between seasons and the severity in weather conditions. The major current in the region rotates in a counter-clockwise fashion, but conditions for individual sites are also affected by local topography, wind speed, and wind direction. The variation in winds and the severity of weather changes create conditions for violent storms today as has happened historically. The damaging effects of winds, currents, waves, and raft ice on submerged cultural resources have been noted (Ellis 1986b:9). In the Hammond area, the accumulation of garbage and industrial or urban waste has contributed to poor visibility underwater, and may also have affected submerged cultural resources (Ellis 1986b:10).

The biotic communities of this portion of Lake Michigan include fish, macroinvertebrates, zooplankton, phytoplankton, and plants. Fish species noted in southern Lake Michigan include coho salmon, chinook salmon, steelhead (*Skamania*, hybrid species of trout and salmon), winter-run steelhead, lake trout, yellow perch, largemouth bass, smallmouth bass, and sunfish species (IDNR 2011). Macroinvertebrates include mussel species such as the damaging zebra and quagga mussels, opossum shrimp, chironomids, and amphipods. Zooplankton species include calanoids, cyclopoids, water fleas, raptorial water fleas, and invasive water fleas (NOAA 2011). Species of phytoplankton include blue-green algae, green algae, diatoms, and flagellates (NOAA 2011). Beneath the water, on the lakebed, plants include fresh water grasses and invasive species such as Eurasian water milfoil.

The plant communities along the shoreline in the southern portion of Lake Michigan, in protected areas such as the Indiana Dunes, include sea rocket and seaside spurge (Greenberg 2011). Pannes, or shallow troughs of sand kept wet by the water table, are a special type of wetland that can develop behind the foredunes (Greenberg 2011). The presence or absence of these plant communities as well as mussels and algae affect the water quality surrounding the submerged cultural resources off the coast of Indiana.

The environment and water quality of Lake Michigan in this region have faced complicated problems over the past century. Marshes, wetlands, meandering streams, and rivers once encompassed the area, providing habitat, plant, and animal diversity that now only exists in protected and undeveloped areas (Northwestern Indiana Regional Planning Commission 2005). Water impairments continue today and are a result of the legacy of industrial development, modern agricultural practices, and residential uses of inland areas whose watershed impacts Lake Michigan.

Previous Archaeological Investigations

DHPA records indicate that only one long-term survey, which was initiated by Gary D. Ellis, has been conducted in Indiana's territorial waters of Lake Michigan. That survey, Marine Cultural Resources Survey (MCRS), appears to have been initiated in the early 1980s and culminated in two site-specific reports (Ellis 1985, 1986b). Numerous other manuscripts and reports were produced as a result of those efforts. The two most comprehensive reports are *Study Unit: Marine Cultural Resources, Seventeenth to Mid-Twentieth Century, on Southern Lake Michigan, Indiana* (Ellis 1986a) and *Historic Context: Marine Cultural Resources, Indiana Territorial Waters of Lake Michigan* (Ellis 1989). All sites or vessels documented by Ellis and the MCRS

surveys were field investigated as part of this multi-year survey effort and were re-surveyed as part of the current project (Table 1).

Table 1. Shipwrecks Investigated within Indiana’s Territorial Waters of Lake Michigan

Vessel Name	Vessel Type	Property Type	Date Built/ Date Lost	County
<i>J. D. Marshall</i>	Steamer	Canaller	1891/1911	Porter
<i>Unknown No. 3</i>	Unidentified	Canaller	19 th Century	Porter
<i>Unknown No. 4</i>	Unidentified	Canaller	19 th Century	Porter
<i>Unknown No. 7</i>	Unidentified	Canaller	19 th Century	Porter
<i>Unknown No. 8</i>	Unidentified	Canaller	19 th Century	Porter
<i>Unknown No. 9</i>	Unidentified	Canaller	19 th Century	Porter
<i>Muskegon (Peerless)</i>	Steamer	Package Freighter	1872/1910	La Porte
<i>F. W. Wheeler</i>	Steamer	Bulk Freighter	1887/1893	La Porte
<i>Horace A. Tuttle</i>	Steamer	Bulk Freighter	1887/1898	La Porte
<i>Unknown No. 5</i>	Unidentified	Work Barge	19 th Century	Lake
<i>Unknown No. 6</i>	Unidentified	Work Barge	19 th Century	Lake
<i>George F. Williams</i>	Steamer (wooden)	Bulk Freighter	1889/1915	Lake
<i>Material Service</i>	Barge	Self-Unloader	1929/1936	Lake
<i>Car Ferry No. 2</i>	Barge	Train Ferry	1895/1906	Lake

In conjunction with the MCERS survey was the development of a program called Indiana Submerged Artifact and Vessel Evaluation (SAVE). This program was launched in 1983 by the IDNR as a response to an individual who attempted to salvage the wreck of the *J. D. Marshall* in Porter County (Ellis 1987a:1). The goal of the SAVE program was to incorporate professional expertise within the IDNR from the DHPA and the Division of Law Enforcement (DLE) to effectively document and evaluate submerged cultural resources. This program was diminished the late 1980s because of other agency obligations.

Over 30 state conservation officers participated in the SAVE program. They were all SCUBA certified with previous recovery training and received additional training in underwater archaeological methods (Ellis 1987a:1-2). During the life of the SAVE program most of the MCERS sites were investigated through this joint effort. The SAVE program also investigated submerged cultural resources outside of Lake Michigan waters in inland lakes. Shipwrecks were mapped, photographed, and video-taped (Ellis 1987a). Team members recorded specifics with regard to wreck location, ship structure, condition, position, dispersion of wreck components, naval architecture, artifacts, and potential for harm to boaters or divers (Ellis 1987a).

In addition to Ellis’ work, several other organizations have conducted research, survey, and documentation efforts within Indiana’s territorial waters of Lake Michigan. The Underwater Archaeological Society of Chicago (UASC) has investigated shipwrecks, such as the *Car Ferry No. 2* (Underwater Archaeological Society of Chicago [UASC] 2011), in Indiana’s territorial waters for several years. The Michigan Shipwreck Research Associates (MSRA) is a newer organization established in the 1980s which has investigated the *Material Service* barge (Michigan Shipwreck Research Associates [MSRA] 2011). Another study, which specifically focused on management strategies for the shipwrecks in Indiana’s Lake Michigan waters, was conducted by Indiana University’s Office of Underwater Science (Beeker et al. 2000).

Background Literature Review

The goal of the background literature review was to sift through historical documents for new clues to resources reported to lie in Indiana's waters. Background research was conducted at the Indiana DHPA, local libraries, local historical societies, regional libraries, regional historical societies, and online resources. Over the years, some information has become disorganized, or in some cases has been completely lost, because much of this information was stored in a paper format without library curation.

Documents that have been reviewed as part of this research include state site files, Lighthouse Service records, United States Lifesaving Service records, United States Coast Guard records, maritime newsletters, maritime society journals, shipwreck charts, ship information and data records, certificates of enrollment, local newspaper articles, correspondence letters, SCUBA diving records, quadrangle charts, bathymetry charts, aerial images, and harbor records. Literature and archival research at historical societies included a review of their shipwreck files, artifact catalog and collections, historical news clippings, library, museum displays, and any shipwreck artifacts.

Numerous vessels (upwards of 80) have been mentioned in the literature, or through personal communication, as having foundered in Indiana's territorial waters of Lake Michigan. These vessels were not located and/or surveyed by the MCRS project in the 1980s. In some documents reviewed, problems were noted when several vessels were listed with the same location information; therefore, the certainty of these vessels within Indiana's territorial waters of Lake Michigan must be verified with survey. Some vessels reported to exist in Indiana's water actually lie in the territorial waters of Illinois or Michigan.

Some vessels were mentioned in literature sources (Ellis 1987b, 1989; Shelak 2003:118) or through personal communication as potentially lying in Indiana waters, but have no location information. In some cases, there was a vague description of where the vessel may have foundered. The potential for locating these sites was considered low. Other vessels were identified through multiple means, including interviews with local residents. Because location and historic information were noted from multiple sources, these vessels were considered to have a high probability of being located or relocated.

The literature review produced information regarding numerous shipwrecks within Indiana's territorial waters of Lake Michigan, but much of that information was vague or filled with inconsistencies. Taking into consideration the nature and condition of previous information and documentation, a culling process was used to select shipwreck sites with a high potential to be located, and these were recommended for archaeological survey or re-survey. Each shipwreck site was analyzed with selection criteria gathered from the background information. This preliminary analysis was conducted to assess each site's potential for: historical relevance, providing additional information, listing in the NRHP, ecotourism, damage caused by looting and/or development, damage caused by environmental conditions, educational value, and use conflict (fishing/diving/boating/shipping). These criteria were addressed with a limited descriptive range of low potential, medium potential, and high potential. The criterion for geographic potential was addressed by the descriptive range of west, central, and east for the regions of Indiana's territorial waters of Lake Michigan. By assessing the sites in this manner, an attempt was made to prioritize which sites to survey and how best to address management concerns.

Most vessels closer to Chicago or closer to Michigan were noted as having a higher potential for looting. Several vessels that were previously identified within the National Park Service, Indiana Dunes National Lakeshore (NPS-IDNL) were more challenging to re-survey because of permitting, land access, and NPS-IDNL agency management procedures. These sites were eventually included in the re-survey. The literature review also provided baseline information to make recommendations of shipwrecks that should be the topics for developing public outreach materials and as potential nominations to the NRHP. These sites were also recommended to receive consideration with regard to protection strategies such as development as Underwater Archaeological Preserves or Marine Protected Areas.

Archaeological Fieldwork Methods

Archaeological methods for this project integrated onshore pedestrian surface survey, nearshore in-water survey, and offshore survey. Onshore pedestrian surface survey was conducted in areas where sites were previously recorded. Exposed ground surfaces from the water line, and inland to the edge of the beach area, were carefully examined for evidence of archaeological resources in transects conducted at 10-ft (3-m) intervals. The edge of the beach area ranged from approximately 20 ft to 200 ft (6.1 m to 60.1 m). Surface areas were also inspected for evidence of erosion, burial, or other disturbance that may have affected the integrity of archaeological resources.

Nearshore in-water survey involved the direct methods of pedestrian survey and snorkeling survey. Pedestrian survey was in water from the shoreline outward into the lake waters to 5 ft (1.5 m) deep. Pedestrian shallow-water survey consisted of a visual inspection of the lakebed, through the surface waters, for ship structure that extended upward into the water, and in some cases extended above the surface of the water. This shallow-water pedestrian survey was conducted at 5-ft (1.5-m) intervals in transects that paralleled the shore. Water surface visibility, defined as the distance seen from the air above the water to the lakebed, exceeded 5 ft (1.5 m) for all in-water pedestrian survey.

Additional nearshore survey, in water from 5 ft to 10 ft (1.5 m to 3 m) deep, was conducted as a snorkeling survey at sites where sidescan survey (see next paragraph) was disadvantaged by the shallow depth of the water in which the sites lay. Snorkeling survey entailed surface swimming with snorkel equipment for a two-phase approach: snorkeling with electronic mapping equipment and snorkeling with digital photographic equipment to document the site. Mapping was accomplished using a handheld Trimble GPS unit with sub-meter accuracy. Satellite points were collected as the snorkeler maintained position above exposed portions of the wreck as seen from the surface. Only exposed portions of ship structure, or debris, were mapped.

Two approaches were used for the offshore survey: indirect remote sensing with sidescan sonar and direct survey. Sidescan sonar units record the presence of objects that sit above lakebed sediments; these objects may or may not indicate the remnants of hulls or shipwrecks. The justification for this specific remote sensing technique is that in the environmental and ecological conditions of southern Lake Michigan, sidescan sonar technology is thought to be the most efficient and effective method to locate unburied historic submerged cultural resources. Newer sidescan technology allows for survey coverage that extends across a larger area and

provides more detailed imagery of the lakebed than older sidescan equipment. Sidescan technology also works fairly effectively in both shallow and deeper waters. Most of the historic shipwreck remains in Indiana have been found to be in shallow areas and to be very low-lying, with limited vertical structure. Although there were examples where the historic wrecks, or portions of them, were covered with sand, the rationale for using sidescan to locate/relocate the sites outweighed other methods such as magnetometry, which would have been much more time consuming.

Two different types of sidescan equipment were used for the indirect remote sensing survey: a dual beam and downscan 900 KHz unit and a dual beam towed 1,600 KHz unit. Because of the shallow nature of the water in the survey areas, both sidescan units were operated at boat speeds of an average of 4 miles per hour (mph) (6.4 kilometers per hour [kph]). Spatial control during survey was maintained through the use of the integrated Wide Area Augmentation System (WAAS) GPS used for navigation, as well as a handheld Trimble unit with sub-meter accuracy. In cases where sidescan or downscan images were distorted because of rough water, additional scanning was conducted. Survey lanes or transects were spaced to provide overlapping coverage within each of the previously surveyed areas and at known sites. The justification for overlapping coverage is that identification and mapping effectiveness are increased. The goal for sidescan coverage at known sites was 200 percent. However, in previously unsurveyed areas, survey lanes were spaced farther apart to document broader areas in an effort to locate anomalies on the surface of the lake floor. Adjustments were made to sidescan range settings once targets were located to increase imagery details, or where shallow water precluded the use of broad range settings. To verify and compare site location and survey coverage, some remote sensing files were also converted and imported into ArcGIS.

Direct survey, using SCUBA divers, was conducted at sites where sidescan survey determined that there were anomalies or targets with a high potential to be cultural historic shipwreck material. Anomalies were ground-truthed through visual inspection during diver survey of the lake bottom at both arbitrary and regular intervals, depending upon the anomaly that was being investigated. Shipwrecks and recognizable anomalies located during the remote sensing survey were also documented with digital photography and/or digital videography by divers. Identified shipwrecks were examined to determine the nature of the wreck and site, the extent and boundaries of the wreck site, and the integrity of the vessel with its associated debris according to National Park Service guidelines (NPS 1992, 2012). In addition, when feasible, measurements of notable features were taken.

No excavation or ground disturbance of any kind occurred as a result of this project and no artifacts were collected. Occasional artifacts that were noted were photographed in situ, at their location, and left in place. All SCUBA diving activities were conducted in accordance with the American Academy of Underwater Sciences (AAUS) guidelines (AAUS 2011), using open-circuit SCUBA, and were conducted as non-decompression dives. In addition, a float plan was filed and the IDNR conservation officers were made aware of when boating activities were ongoing.

2011 Survey Results

In total, 2.4 acres (ac) [1 hectare (ha)] of shoreline and 1537 ac (622 ha) of Lake Michigan waters were surveyed during the course of this project. Because several sites were close to shore, those sites were surveyed with multiple methods. Onshore pedestrian survey, nearshore shallow-water pedestrian survey, additional nearshore snorkeling survey, and offshore survey were all conducted. Twenty-eight days of fieldwork were performed to complete all survey needs. All but one (12Pr640) of the sites documented in the 1980s was assigned a new Indiana state site file number as a result of this project. Site 12Pr640 was assigned a site file number in 2006 but had never had a site form submitted for it until this project. The stories of these shipwrecks, the tragic tales of ship loss, and the archaeological histories are discussed below.

J. D. Marshall (12Pr723)

History. The *J. D. Marshall* began as the idea of J. C. Pereue, and he made a decision to build this steamer in 1891 (Grand Haven Messenger [GHM], 9 January 1891). The *J. D. Marshall* was launched on July 4, 1891, and began transporting lumber first for Pereue and then for the Williams Transport Company (The Marine Review [TMR], 16 July 1891; Milwaukee Public Library 1959). Other owners included J. O. Neesen and Company and the Independent Sand and Gravel Company (Figure 2) (Ellis 1985:5; Milwaukee Public Library 1959). At one point the *J. D. Marshall* had been converted as a sand-sucker or sand barge. The *J. D. Marshall* was purchased by the Sand and Gravel Company with funds from an insurance settlement when the ship *Muskegon* was lost, and it was outfitted with some of the equipment salvaged from the *Muskegon*. The *J. D. Marshall* capsized on June 11, 1911, just a day after the *Muskegon* was scuttled. Four lives were lost when the *Marshall* sank. Three crew members were below deck when the vessel turned over, and one member of the crew was found dead at the surface (The Evening News [TEN], 12 June 1911; TEN, 13 June 1911; TEN, 20 June 1911). Reportedly the *J. D. Marshall* set out onto Lake Michigan that day and collected approximately 400 cubic yards (306 cubic meters) of sand but sprung a leak about 5 pm (TEN, 12 June 1911). The vessel lay at anchor already taking on water when a storm arose, causing the sand in the hull to shift and the vessel to roll over. After capsizing near the shore, it apparently remained afloat for several days and served as a local attraction for a short while (Ellis 1985:7).

The *J. D. Marshall* was generally described as a steam-barge (C. Patrick Labadie Collection, Thunder Bay National Marine Sanctuary 2012) but has also been described as a steamer vessel type and a canaller property type (Ellis 1986a). This wooden vessel was built in the Martel Boatyard, at South Haven, Michigan. The engines and the boilers were built by the Phoenix Iron Works in Port Huron, Michigan (C. Patrick Labadie Collection, Thunder Bay National Marine Sanctuary 2012). The ship measured 154.5 ft (47.1 m) in length by 33.5 ft (10.2 m) abeam with a draft of 12 ft (3.7 m) and weighed 531 gross tons (539.5 metric tonnes [mt]) (C. Patrick Labadie Collection, Thunder Bay National Marine Sanctuary 2012; TMR, 30 July 1891). It was an open-hulled steamer with one deck and was operated by propeller (Bowling Green State University [BGSU] 2012; C. Patrick Labadie Collection, Thunder Bay National Marine Sanctuary 2012). The *J. D. Marshall* is representative of a small to medium-size class of Great Lakes freighters originally designed for the lumber trade. The *J. D. Marshall* was discovered by SCUBA divers in 1979 and, prior to its damage by illegal salvaging, it was considered to be the

most intact of the shipwrecks in Indiana's Lake Michigan waters (DHPA 1982; Ellis 1987a:1, 1985:7).

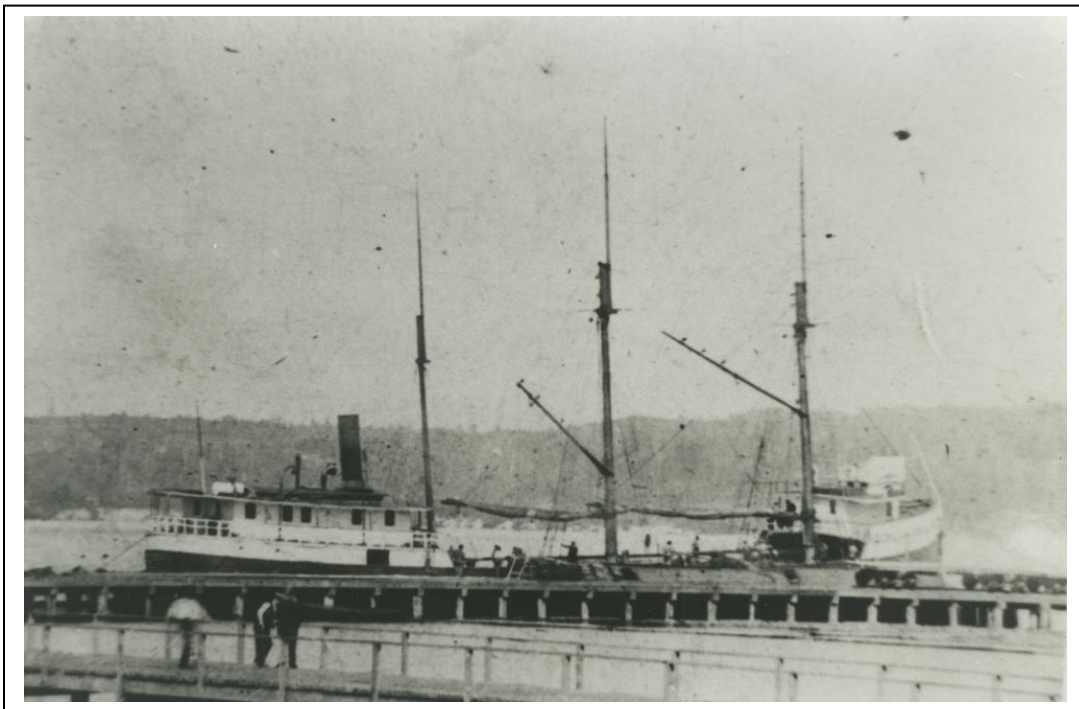


Figure 2. Historic photograph of the *J. D. Marshall* (Used with permission, C. Patrick Labadie Collection, Thunder Bay National Marine Sanctuary, Alpena, MI).

The *J. D. Marshall* is now famous in Indiana history not only for its historical significance, but also because the attempted salvage of this vessel was the initial impetus for the state's efforts to survey, document, and evaluate historic vessels in Indiana's state waters. A 1982 salvage attempt of this vessel was illegal according to Indiana State Preservation laws (IC 14-3-3-4, Section 7) (Ellis 1987a:1; Gantz 1982). At the time of the attempted salvage, the ship was re-floated, moved, and the prop was cut off. Then the means of refloating the vessel failed and it crashed back to the bottom (Ellis ca. 1987a:1). This salvage attempt was reported by local divers to state authorities. Salvage activities were stopped when the individuals involved were apprehended by officers from the Division of Law Enforcement. As a result of this salvage attempt and other activities which have removed artifacts from this site, the *J. D. Marshall* lies within an archaeological context that is disturbed. According to early 1980s accounts, the vessel's attributes were damaged, artifacts displaced, deck and internal equipment scattered, and hull integrity compromised (Ellis 1987a:1).

Archaeology. The *J. D. Marshall* exists similarly to how it was described during the initial MCRS survey in the 1980s (Ellis 1986a:2). However, the site is now much more buried by sand than was recorded in 1986, and appears slightly more buried than it was when noted in 2000 (Beeker et al. 2000:30). The vessel still lies on its side and upside down. The site contains a portion of the main frame of the vessel and one large section of sidewall that was separated from

the bow. The exposed portion of main frame measured 116.8 ft (35.6 m) long in the early 1980s, but measured only approximately 50 ft (15.2 m) long in 2011. So, the site has been substantially covered with sand since the first survey. The width of the main frame measured 25 ft (7.6 m) wide in 2011.

The stern timbers and planking have continued to separate but not as dramatically as was anticipated by Ellis (1986a:8). The original beam appears to have relaxed further, continuing to flatten out the hull. The keel remains in an upright position and the skeg (the extension of the keel at the back of the ship where the rudder attaches) is still in place. The turn of the bilge (the curve where the bottom and sides of the ship meet) on the starboard side has not yet separated as substantially as was anticipated. Both sides of the turn of the bilge remain connected to the main frame and keel (a beam or series of beams at the bottom of a ship to which the other ship timbers attach- the “spine” of a ship). Various pieces of planking protrude from the level of the hull, most likely as a result of settling. There was no hole at the southwest end of the main frame at the time of survey. Thus, no access or view was obtained into the interior or bilge area of the *J. D. Marshall*. The breach in the hull just north and east of the boiler (Ellis 1989:20-22) was still present, but allowed only a limited view of ribs, frames, and internal ceiling planks because most of the area was filled in with sand.

Some mechanical equipment was still present at the time of the 2011 survey and included the *J. D. Marshall's* scotch boiler (a boiler is a cylindrical metal container where steam is produced to drive a steam-operated engine- Scotch is a specific type of maritime boiler) assembly (firebox, condenser, and preheater), engine vacuum assist cylinder, and machinery parts. The boiler's large airflow grate did have some zebra mussel coverage and numerous round goby fish inhabited the small openings of the grate. The single cylinder engine was also still present on the starboard side of the wreck, southeast of the boiler; however, the engine cylinder was so completely covered with zebra mussels, except for a small pipe and valve at the base, it was almost unrecognizable. Informant interviews and sidescan data indicate that equipment from the salvage attempt is also still present at the site (Taylor 1982). Because so much more of the site was buried, the site boundaries were determined from 1982 and 2011 survey data combined. The site area is defined as 350 ft (106.7 m) long and 300 ft (91.4 m) wide surrounding the main frame.

Unknown No. 3 (12Pr718)

History. The wreck of *Unknown No. 3* was one of five historic shipwreck sites that were identified in the 1980s but were not relocated as part of the 2011 survey. Although it was recognized that remains from *Unknown No. 3* are rather large, it was postulated that the wreckage represents the disarticulated remains from the *Moses Gage* (DHPA 1984). However, to date, there has not been enough evidence and information recovered from the vessel to associate it definitely as the *Moses Gage*. Several other identities have been proposed for this vessel based on the assumption from frame measurements that this vessel was a medium-sized lumber hooker ranging in weight from 500 to 1000 gross tons (508 to 1016.1 mt) (Ellis ca. 1984, 1986a:90). These potential identities include the *Hiroudelle*, *Fayette*, *Michigan City*, and *Helen Taylor*. Information from the 1980s survey indicates that the vessel appeared to have been deliberately or inadvertently abandoned. Records list vessels as having been lost in the region but do not provide enough specific details to assign a specific identity to the wreck at this time.

The *Unknown No. 3* was an unknown wooden vessel type and a canaller property type. It appears to have been a bulk-cargo type of vessel from investigations of the hull (DHPA 1984). The actual length of the ship is unknown, but when surveyed in the 1980s, the remaining portion of the main frame measured 83.4 ft (25.4 m) in length by 34.6 ft (10.6 m) abeam (DHPA 1984; Ellis 1986a:86). Reviewing the number of frames and the consistency in the hull's beam, it was estimated that this vessel would have been 160 to 200 ft (48.8 to 61 m) long (Ellis 1986a:88). The vessel's main frame was of solid oak, had 48 surviving frames, and had a scarphed keelson (a keelson is a specific arrangement of timbers attached to the top of a keel to provide more strength- scarphed refers to the timbers having been joined, end to end as two fitted pieces, like two puzzle pieces) (Ellis 1986a:88). Artifacts recovered from the site in the 1980s date the vessel to the late nineteenth to early twentieth centuries.

Archaeology. The reported location for *Unknown No. 3* was surveyed in July and August 2011, after permission for access was granted by the Indiana Dunes National Lakeshore. Pedestrian surface survey was conducted for approximately 1000 ft (304.8 m) adjacent to the reported site location. Remote sensing survey was conducted offshore from the reported site area. No direct diver survey was conducted, as the presence of extant structure could not be confirmed. The wreckage is most likely buried.

At the time of the first survey (Ellis 1986a), it was noted that wreckage present included a section of the port side of a main frame of the vessel. Although this piece of wreckage was fairly wide, no evidence of additional vessel structure was observed. No debris field, mechanical equipment, hardware, or artifacts were noted at the time of the 1980s survey (Ellis 1986a:88). The site boundary for the *Unknown No. 3* was derived from previous survey documentation because the site was not relocated as part of the 2011 survey efforts. The site area is defined as 140 ft (42.7 m) surrounding the main frame fragment in an unknown depth of water.

Unknown No. 4 (12Pr640)

History. The remains of *Unknown No. 4* has a nickname, the *Alpha Wreck*, which was given to the wreck in 2006 by a group of individuals from outside the state of Indiana when they surveyed the vessel as part of what they called the "Brigg's Project" (Jim Jarecki, personal communication 2011). Although there are historical documents that reference a shipwreck in the area, as yet there has been no scientific evidence that definitively correlates *Unknown No. 4* with the vessel described in those documents. Therefore, because the vessel's registry and official name have not yet been identified, no historical background information was obtained for this vessel through the literature search. Based on previous examination, the construction techniques, the presence of hand-hewn timbers, and the presence of hand-wrought hardware, the vessel appears to date from the early to middle nineteenth century (DHPA 1985a; Ellis 1986a:98). The *Unknown No. 4* was a small wooden vessel, possibly schooner type and a canaller property type. Cannallers were smaller vessels specifically built to travel through canals between inland waterways and the Great Lakes. The vessel construction date is approximated to the nineteenth century.

Archaeology. Wreckage exposed at the time of the first survey in 1984 included the bow stem, stem knee, interior planking, exterior planking, and frame sections with ribs (Ellis 1986a). Previously identified machinery appears to be buried by sand. Surviving pieces of

equipment and artifacts exist but are not together as part of one collection. The *Unknown No. 4* was surveyed in July 2011. The *Unknown No. 4* still lies on its hull and keel, both onshore out of the water and offshore in the water. At the time of the 2011 survey, it was observed that the exposed parts of the vessel were ribs associated with the main frame. No sidewall sections, planking or specific machine components were exposed above the sand bottom. Local residents stated that the vessel has been 90 percent covered by sand for the past 5 years. In 2012, artifacts from site 12Pr640 that were previously removed from the site underwent additional research, identification, inventory, conservation, and curation. Professional conservation treatment of the metal and organic artifacts took over seven months and these artifacts were returned to the Indiana State Museum and Historic Sites (ISMHS) for permanent curation.

It is apparent the site lies in a very dynamic environment and that the site exposure has changed over the years. Although local residents have pictures of the site more exposed by winter ice (such as in 2006), this survey noted that more of the vessel appears buried, compared to what was recorded in the 1980s. The site boundaries were determined from 1986 and 2011 survey data. The site area is defined as 140 ft (42.7 m) long and 75 ft (22.9 m) wide surrounding the main frame. The remaining portion of the main frame measured 86 ft (26.2 m) in length by 18 to 20 ft (5.5 to 6.1 m) abeam with a draft of 6 ft (1.8 m) and an estimated weight of 2 gross tons (2 mt) (DHPA 1985a). Another document listed the length as 60 to 80 ft (18.3 to 24.4 m) by 12 to 16 ft (3.7 to 4.9 m) abeam (Ellis 1986a:94). However, at the time of the 2011 survey it only measured approximately 55 ft (16.8 m) in length by 16 ft (4.9 m) in width. *Unknown No. 4* is interpreted as a sailing vessel because of the construction as well as the lack of machinery, propeller, and engine-related components (DHPA 1985a; Ellis 1986a:98).

Unknown No. 7 (12Pr720)

History. The site of *Unknown No. 7* was reported to DHPA in 1986 by Mr. Littlefield of the Indiana Dunes National Lakeshore (IDNL) (DHPA 1986). The identity for this vessel has not been determined. Because the vessel's registry and official name have not been identified, no historical background information was obtained for *Unknown No. 7* through the literature search. The dimensions of *Unknown No. 7* indicate that it was a small to medium-sized vessel of which numerous similar vessels were lost in the area. It is believed the wreckage was first identified as a result of the review of aerial photographs taken in the 1980s which indicated the potential for a wreck.

The *Unknown No. 7* was suggested as a bulk-cargo wooden vessel type and a canaller property type (DHPA 1986). It was constructed in the nineteenth to twentieth centuries. The only section present at the time of the first survey in the 1980s was an isolated port side piece of the bow. The main frame to which this port side section belonged was suggested as being buried (DHPA 1986). The wooden wreckage was reported as being similar enough to an adjacent collapsing house, that pieces of vessel timber could easily have been mistaken for house debris (DHPA 1986).

Archaeology. The site was first archaeologically surveyed in 1986, using pedestrian surface survey, limited subsurface probing survey, snorkeling, and SCUBA (DHPA 1986). In 2011, the reported location for *Unknown No. 7* was surveyed in July and August. Pedestrian surface survey was conducted for approximately 1000 ft (304.8 m) adjacent to the reported site

location. No snorkel or direct diver survey was conducted, as the presence of extant structure could not be confirmed. The wreckage is most likely buried.

No mechanical equipment, hardware, or artifacts were noted during the 1980s survey or at the time of the 2011 survey. Any associated mechanical equipment and hardware are most likely buried. The site boundary for the *Unknown No. 7* was derived from previous survey documentation because the site was not relocated as part of the 2011 survey efforts. In the 1980s, the bow section of wreckage measured approximately 20 ft (6.1 m) from northwest to northeast by 40 ft (12.2 m) from northwest to southeast (DHPA 1986). The site area is defined as 70 ft (21.3 m) surrounding the location of the vessel fragment that was recorded in the 1980s.

Unknown No. 8 (12Pr721)

History. The identity for this vessel has not been determined. Therefore, because the vessel's registry and official name have not been identified, no historical background information was obtained for *Unknown No. 8* through the literature search. The dimensions of *Unknown No. 8* indicate that it was a small to medium-sized vessel. The site was first reported in 1987 and was identified by DHPA during survey (DHPA 1987a).

The *Unknown No. 8* was possibly a wooden bulk-cargo vessel type and a smaller property type (DHPA 1987a). It was constructed in the nineteenth to twentieth centuries. There were two existing sections, one was a deteriorated portion of the bow and a smaller section which had a spike connecting two pieces (DHPA 1987a).

Archaeology. The site was first archaeologically surveyed in 1987, using pedestrian surface survey, limited subsurface probing survey, wading, and snorkeling (DHPA 1987a). In 2011, the reported site for *Unknown No. 8* was surveyed in July and August. Pedestrian surface survey was conducted on July 24, for approximately 900 ft (274.3 m) adjacent to the reported site location. Remote sensing survey was conducted offshore from the reported site area. No direct diver survey was conducted, as the presence of extant structure could not be confirmed. The wreckage is most likely buried.

In the 1980s, the section of the bow measured approximately 15 ft (4.6 m) in length and 12 ft (3.7 m) wide (DHPA 1987a). The smaller section measured 8.6 ft (2.6 m) in length and 4 ft (1.2 m) wide (DHPA 1987a). Together the pieces of the wreckage that made up the site measured 20 ft (6.1 m) in length and 22 ft (6.7 m) wide. In the 1980s, all that remained at this site were some frames and exterior planking. The wreckage may have been a portion broken from vessel *Unknown No. 7*. The site boundary for the *Unknown No. 8* was derived from previous survey documentation because the site was not relocated as part of the 2011 survey efforts. The site area is defined as 40 ft (12.2 m) surrounding the location of the vessel fragments that were recorded.

Unknown No. 9 (12Pr722)

History. The identity for this vessel has not been determined. Because the vessel's registry and official name have not been identified, no historical background information was obtained for *Unknown No. 9*. The dimensions of *Unknown No. 9* indicate that it was a medium-sized vessel. The site was also first reported in 1987 and was identified by DHPA during shoreline survey (DHPA 1987b).

The *Unknown No. 9* was possibly a bulk-cargo vessel type and a canaller property type. It was constructed in the nineteenth to twentieth centuries. The only existing section measured 20 ft (6.1 m) in length and 17 ft (5.2 m) wide (DHPA 1987b). Based on examination of the site and vessel structure present, it was suggested that the vessel may have measured at least 100 ft (30.5 m) (DHPA 1987b).

Archaeology. The site was first archaeologically surveyed in 1987, using pedestrian surface survey, limited subsurface probing survey, wading, and offshore survey by boat with sub-bottom sonar (DHPA 1987b). In 2011, the reported site for *Unknown No. 9* was surveyed in July and August. Pedestrian surface survey was conducted adjacent to the reported site location. Remote sensing survey was conducted offshore from the reported site area. No direct diver survey was conducted, as the presence of extant structure could not be confirmed. The wreckage is most likely buried.

Wreckage present at the time of the first survey included an isolated port side section of bow structure of the vessel. This portion included the stem (foremost part of the ship's hull), apron (a curved timber found at the lower part of the stem and above the keel), deadwoods (heavy timbers fastened over and parallel to the keelson to attach timbers from the bow and stern), frames (timbers in a ship's hull that extend from the keel to the deck- the ship's skeleton), external planks (timbers on the outside of the ship- the ship's skin) (DHPA 1987b). The site boundary for the *Unknown No. 9* was derived from previous survey documentation because the site was not relocated as part of the 2011 survey efforts. The site area is defined as 50 ft (15.2 m) surrounding the bow section fragment (DHPA 1987b).

Muskegon [aka Peerless] (12Le381)

History. Only one shipwreck site in the state of Indiana, the *Muskegon*, is listed in the Indiana Register of Historic Sites and Structures (state register). This site is also the only Indiana shipwreck listed in the National Register of Historic Places (NRHP). It is one of the oldest vessels in Indiana's waters. The *Muskegon* was built in 1872 by Ira Lafrinier and began life as a combination passenger and package freight vessel called the *Peerless* for the Lake Michigan and Lake Superior Transportation Company (Milwaukee Public Library 1959) (Figure 3). In 1908 the *Peerless* was renamed to the *Muskegon* (Milwaukee Public Library 1959). The newly named *Muskegon* was sold to Buck and Mullen SS et al. as part of the Buck and Mullen Steamship Company (Milwaukee Public Library 1959). As the *Muskegon*, this vessel was re-fitted twice, once as a lumber-hooker and later as a sand-sucker. Towards the end of its use-life, the ship was considered part of a class of package-freighters that served as multi-purpose non-bulk freight and passenger carriers (Ellis 1987a:3). There was also folklore that after its use for lumber transportation around 1907-1908, the *Muskegon* served as a floating gambling house and possibly a bordello for a very brief time (C. Patrick Labadie Collection, Thunder Bay National Marine Sanctuary 2012; Ellis 1988:6).

The *Muskegon* burned at a Michigan City dock in 1910, after which the ship was scuttled approximately two miles west of the harbor. Reportedly the vessel burned to just above the water line at the Indiana Transportation Company's dock. The cause of the blaze was believed to be the ignition of kerosene or oil residue that was near the boilers (Ellis 1986a:36). The vessel sank at the dock after the fire and stayed there until June 10, 1911, when the vessel was re-floated and

towed out of the harbor to be scuttled. No lives were lost when the ship burned. The Indiana Transportation Company salvaged some of the sand-sucking machinery (Ellis 1986a:36).



Figure 3. Historic photograph of the *Muskegon* (aka *Peerless*) ca. 1879 (Used with permission, Great Lakes Marine Collection of the Milwaukee Public Library, Milwaukee, WI).

The *Muskegon* was a steamer vessel type and a package-freighter property type. This vessel was built at Cleveland, Ohio. The ship measured 211 ft (64.3 m) in length by 39.9 ft (12.2 m) abeam with a draft of 12.5 ft (3.8 m) and originally weighed 941 gross tons (955.9 mt) (Merchant Vessel List 1909). This vessel was first operated by Leopold and Austrian out of Chicago (BGSU 2012; Milwaukee Public Library 1959). When the *Muskegon* was the *Peerless*, the vessel was equipped with a large reciprocating engine and dual boilers. The *Peerless* was renamed as the *Muskegon* in 1907 after the Muskegon and Chicago Navigation Company purchased the ship (C. Patrick Labadie Collection 2012).

The *Muskegon* is representative of a medium-size class of Great Lakes passenger-freighters originally designed for the lumber trade. However, this ship is also representative of a variant type within this specialized class of steam-powered vessels (Ellis 1988:3). In addition, the *Muskegon* contains unique naval architectural design features of a distinct class of package-freighters constructed during the 1870s (Ellis 1987a:3) that include a “Bishop Arch Longitudinal” support structure (an arrangement of timbers that provide support to a part of the ship- the Bishop Arch is a specific kind of arch system that provided support to each sidewall of

the *Muskegon*) and a complete (though disarticulated) single piston drive engine. These architectural facets of the *Muskegon* contributed to its listing in the NRHP.

Archaeology. When surveyed in 2011, the *Muskegon* was still lying on its hull and keel. The wreck consists of the main frame, sidewall sections, and specific machine components. The main frame of the wreck appears to be more disarticulated than was previously mapped (Beeker et al. 2000; Ellis 1987b:19), because the bow section is not parallel with the stern portion. The main frame that still exists on the lakebed is approximately 78 ft (23.8 m) in length. The main frame now appears separated at the location of the south boiler. Timbers and ribs are exposed along the gap between the two sections of main frame. It is unclear whether or not the main frame is completely separated because sand filled in the open space of the hull. Three major sidewall segments still exist on both the port and starboard sides of the vessel. The starboard forward sidewall was described as being 96 ft (29.3 m) long, lying south and east of the main frame with a portion of its Bishop Arch and secondary strap arch both attached (Ellis 1988:20). This piece of sidewall now appears to be more distant from the vessel main frame. The aft portion of the starboard wall still appears to the south of the stern and propeller area. The fourth piece of structure, the port sidewall, was recorded as being directly to the north of the main frame (Ellis 1988:22). The port sidewall now appears to be more buried by sand than was recorded in 1988.

The most notable change in the structure of the wreck appears at the center portion of the hull, just to the east of the boilers: the vessel hull has been broken and separated where a large pipe runs across the site. This pipe continues across previously unexposed portions of the wreck site (particularly through the center of the wreck), on top of ship hull structure, and possibly below ship hull structure. This pipe was first recorded in 2000. When the pipe was noted in 2000, it was described as being a recent intrusion because “The placement of the pipe appears to have been a relatively recent event, as the clay sediment shows evidence of recent settling of the pipe with little siltation around the pipe and no attachment of Zebra mussels to the metal pipe sections” (Beeker et al. 2000:10). Remote sensing and direct diver survey in 2011 identified portions of this plastic composite pipe to the east and west of the main frame which measured at least 388.8 ft (118.5 m) in length.

The mechanical equipment still present at the time of survey included the two boilers, engine cylinder, exhaust tube (or smokestack), and some mechanical equipment. The two scotch boilers are intact and in the same position as they were mapped by Ellis (1988). The boilers were home to numerous round goby fish and were completely encrusted with zebra mussels. The easterly boiler is now bordered by a very large intrusive composite plastic pipe at the base, closest to the substrate bottom. The engine cylinder and exhaust tube still lay off the port side of the main frame of the vessel. The lower engine support pillars, engine pit, and gear box are also still on the wreck; however, the flywheel, valving rods, and main pushrod are obscured by zebra mussel growth. The engine propeller/shaft connection (or clutch assembly) are still in place. Other equipment such as the three-bladed propeller and propeller shaft are still intact, although completely covered with zebra mussels. Some of the machinery is still partially buried in the clay and sand bottom as well as being coated with mussels. The site boundaries were refined at the time the *Muskegon* was listed in the NRHP as 400 ft (121.9 m) on each side of the main frame (Ellis 1988:4).

F. W. Wheeler (12Le382)

History. This ship was built in 1887 by F. W. Wheeler at West Bay City (now Bay City), Michigan, for David Whitney of Detroit (Ellis 1986a:51; Milwaukee Public Library 1959) (Figure 4). This vessel was most likely operated by David Whitney because there was no record of ownership changes (BGSU 2012). The vessel could carry over 70,000 bushels (1524 mt) of wheat, which it transported from Chicago to Buffalo (Milwaukee Public Library 1959). It was also used to transport coal.

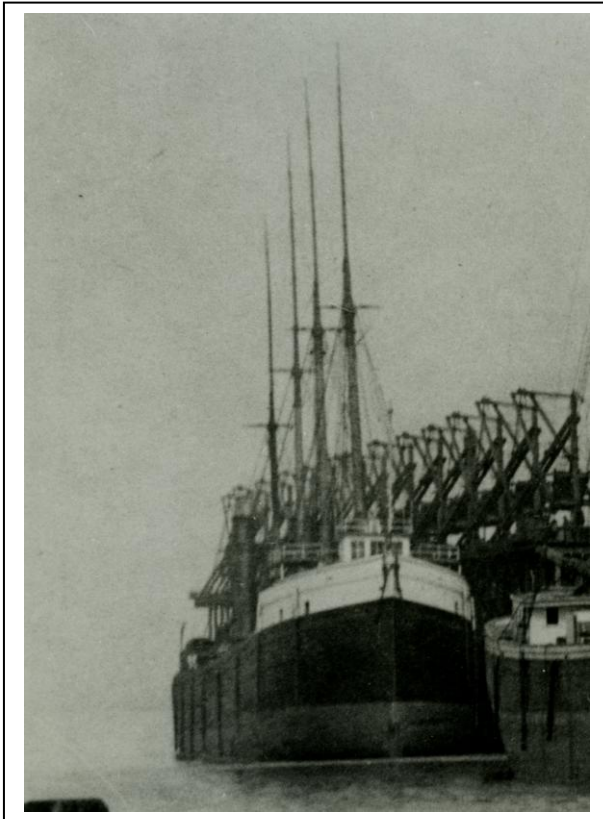


Figure 4. Historic photograph of the *F. W. Wheeler* (Used with permission, C. Patrick Labadie Collection, Thunder Bay National Marine Sanctuary, Alpena, MI).

The *F. W. Wheeler* was stranded on December 3, 1893, during a winter storm while carrying a cargo of coal from Buffalo, New York (Milwaukee Public Library 1959). The local lifesaving station under the direction of Captain Finch was credited with saving all of the 16 crew members who were on board the vessel (City News [CN], 25 September 1935). The *F. W. Wheeler* was under the command of Captain Trotter at the time of its foundering near Michigan City (Cavinder 1978:1; CN, 25 September 1935). An attempt was made to aid the vessel before it sank and broke apart, but one of the tugs, the *Crowell*, sank on its way to assist the *F. W. Wheeler* (CN, 25 September 1935). The crew of the *Crowell* was rescued by another tug on its way to assist the *F. W. Wheeler*. In addition, two tug boats assisted with lightening the ship's cargo by removing some coal. However, within two days, the back of the *F. W. Wheeler* was broken and it was considered a total loss. The vessel was reported to have been carrying a cargo that in total weighed over 2000 tons (2032.1 mt). At the time of its sinking, it was still carrying 1200 tons (1219.3 mt) of coal (Cavinder 1978:1). It was reported that wreckage from the *F. W.*

Wheeler washed ashore for months, and that locals collected it to use for building and kindling (CN, 25 September 1935).

The *F. W. Wheeler* was a steamer vessel type and a bulk-freighter property type. The ship measured 265.5 ft (80.9 m) in length by 40.5 ft (12.3 m) abeam with a draft of 19.4 ft (5.9 m) and weighed 2300 gross tons (2336.9 mt) (Ellis 1986a:51; Milwaukee Public Library 1959). It was a part of the shipping industry's efforts to increase uses for wooden freighters (Ellis 1986a:51). Architecturally, the *F. W. Wheeler* was not a unique vessel, but it did represent the height of large wooden freighter construction (Ellis 1986a:56). It was built with arches and strapping as a way to strengthen the vessel and to prevent what is called vessel hogging. The vessel had an internal iron strap arch that ran the length of the vessel with "X" patterned cross-straps (Ellis 1986a:51). In addition the ship was fitted with 4 masts, a triple expansion engine, and dual scotch boilers.

Archaeology. The *F. W. Wheeler* was surveyed by indirect remote sensing in July and August 2011, and direct diver surveyed in August 2011. The *F. W. Wheeler* still lies as separated pieces of wreckage. In the 1980s, the *Wheeler* was reported as lying broken in four major pieces (Ellis 1986a:53). Although the 2011 remote sensing survey was extended well beyond the reported area of the wreck, only two of the four sections of the wreck were definitively relocated. These two sections were verified as pieces of wreckage by direct diver survey and consist of mid-sections of main frame with sidewalls, hull, and machine components. There were three other areas and an anomaly identified from remote sensing data that may represent vessel structure or portions of *F. W. Wheeler* wreckage, but were not diver verified. These sections also appear to be portions of main frame with sidewalls and hull. The portions of the wreck appear more dispersed than was previously recorded (Ellis 1986a:53).

One of the two verified sections of the *F. W. Wheeler*, the eastern section, still lies on its keel. This section is buried in sand deep enough so that the extent and length of this section could not be determined at the time of survey. Minimally, the exposed portion measured 39 ft (11.9 m) long by 19 ft (5.8 m) wide. This section consisted of hull with planking partially exposed and the southwestern edge with the ribs and base of hull exposed beneath the ribs. The ribs are well worn and jagged, most likely from weather and water effects. In addition, there was a recessed area at the north end that was a deliberate construction and not a recessed area caused by hull breakage. This area may represent the engine or boiler compartment. At this eastern section, no sidewalls appeared above the buried portion of the wreckage. The other verified section of the *F. W. Wheeler*, the western section, also still lies on its keel. This section is buried in sand deep enough so that the extent and length of this section could not be determined at the time of survey. Minimally, the exposed portions measured 31 ft (9.4 m) long by 12 ft (3.7 m) wide. This section appeared to have a small portion of gunwale exposed – 1 ft (.3 m) – and partially exposed hull with planking.

Remnants of mechanical equipment were located during the 2011 survey in the area of the *F. W. Wheeler*. This equipment was a corrugated metal pipe, metal sheeting with bolts in it, and smaller pipe. This equipment may represent the boiler or engine remnants. No large pieces of mechanical equipment were located in the area during this survey. Hardware that was present at both sections of the wreck consisted of nails, bolts, and washers that were fixed into the planking or ribs. No other loose equipment or artifacts were encountered. This survey noted that more than half the vessel appears buried compared to what was recorded in the 1980s. Because so much more of the site was buried, the site boundaries were determined from 1982 and 2011

survey data. The site area is defined as 600 ft (182.9 m) long and 300 ft (91.4 m) wide surrounding the separate pieces of main frame.

Horace A. Tuttle (12Le380)

History. The *Horace A. Tuttle* was designed to compete in the Lake Superior trade and transport cargo such as ore and grain. The ship was initially owned by eight different individuals and maintained enrollment in Cleveland, Ohio through its entire service. Numerous tragedies struck the *Tuttle* during its career. The most dramatic did not actually happen to the ship but to one of its owner's, Captain Minch, who perished with some of his family when another ship, the *Western Reserve*, broke apart and sank at the end of summer in 1892. The demise of the *Horace A. Tuttle* occurred when it became waterlogged during a severe storm on the way to Chicago from Buffalo, and sank on October 26, 1898, near Michigan City (Detroit Free Press [DFP], 27 October 1898). However, a life saving report from that era gave the date of sinking as October 16 (Milwaukee Public Library 1959). Because the ship was so waterlogged, the vessel's hatches amidship stove in or collapsed causing distress. The ship headed for port only to hit a sand bar just outside of the harbor (DFP, 27 October 1898; Milwaukee Public Library 1959). Because of the storm, the ship reportedly struck the sand bar, swung around stern first against the end of a pier, then swung off the pier, and immediately stranded offshore (Milwaukee Public Library 1959). Another account reported that the *Horace A. Tuttle* lost a rudder because of the storm and while trying to make port, hit a breakwall, and finally stranded at the mouth of the harbor (BGSU 2012). Regardless of the details, the storm was so fierce that it washed away much of the hull within several hours (Milwaukee Public Library 1959).

No lives were lost because all 14 crew members were rescued by the local lifesaving station (Milwaukee Public Library 1959). At the time the vessel sank, it appears to have been under the ownership of Nicholas Transit Company (DFP, 27 October 1898). When the vessel sank, it was carrying a cargo of approximately 176,000 bushels (3831.9 mt) of corn (BGSU 2012). Some of the corn cargo was salvaged and sold to Captain E. Napier of St. Joseph, Michigan, by one of the insurance adjusters, R. E. Ripin (Evening Dispatch [ED], 28 October 1898). After the insurance sale, it was said that about 15,000 bushels remained in the hold of the ship (ED, 28 October 1898; Michigan City Dispatch [MCD], 3 November 1898). The insurance value of the ship was reported as \$72,000 and the insurance value of the cargo of corn was \$76,000 (Duluth Evening Herald [DEH], 27 October 1898; Duluth News Tribune [DNT], 26 December 1898). The wreckage was not completely removed from the harbor mouth until May 1899 by a Captain James Reid and wrecking crew on behalf of the U. S. government (TEN, 5 May 1899).

The *Horace A. Tuttle* was a steamer vessel type and a bulk-freighter property type. It was constructed in 1887. One source says the *Horace A. Tuttle* was built by George Presley & Co. for Johnson, Palmer and Company at the Cleveland Dry Dock Company in Cleveland, Ohio (BGSU 2012; Milwaukee Public Library 1959). The ship measured 250 ft (76.2 m) in length by 38.6 to 38.8 ft (11.8 m) abeam with a draft of 20 ft (6.1 m) and weighed approximately 1585 gross tons or 1355 net tons (1610.4 mt) (BGSU 2012; Milwaukee Public Library 1959). The *Horace A. Tuttle* represents a class of medium-sized steamers but was also a transition vessel with a steel hull containing wooden framing. It was suggested to be one of the last in a class of bulk-cargo carriers that were built to bridge the gap in changing naval design and technology (Ellis

1987a:3). Steam pumps were on board the vessel and were used to remove water from the hold when the hatches failed (DFP, 27 October 1898; DNT, 26 December 1898).

Archaeology. The reported location for the *Horace A. Tuttle* was surveyed in July and August 2011 and again in August and September 2012. Direct diver survey was conducted to verify anomalies in 2012, but the presence of extant structure could not be confirmed. The remote sensing survey was extended well beyond the reported location of the wreck.

The *Horace A. Tuttle* most likely still exists but is extremely buried. At the time of the 1980s survey, the stern was noted as missing and only a small section of main frame remained. The partially disarticulated hull, main frame and mast step were structural elements still present (Ellis 1986a:69-70). It was also noted that the vessel lay in very shallow water, was mostly buried in the sand, and would be totally buried within a few years (Ellis 1986a:68, 1986a:3).

Unknown No. 5 and Unknown No. 6 (12La640)

History. Vessels *Unknown No. 5* and *Unknown No. 6* are two shipwrecks which were assigned one state site file number in June 2011. They were designated as one archaeological site because of their proximity to each other. The identities for these vessels have not been determined. Because their registries and official names have not yet been identified, historical background information for these vessels was not obtained through the literature search. The vessels were first identified in the 1980s. A review of aerial photographs, taken in the 1940s, clearly showed both vessels as well as their associated debris (Ellis 1986a:100).

The wreckage of *Unknown No. 5* dates to the late nineteenth to early twentieth centuries based on examination of the metal fastenings and spikes still present on the vessel (Ellis 1986a:101). Also, limestone blocks were not typically used as ballast, which implies that perhaps the limestone blocks may have been part of the cargo of the vessel (Ellis 1986a:101). This information might assist with the identification of *Unknown No. 5*. *Unknown No. 6* may have had some limestone blocks associated with it, but was in a much worse state of disarticulation and identification seems less feasible. However, being of a similar nature, *Unknown No. 6* most likely also dates to the late nineteenth to early twentieth centuries.

In the DHPA files, there were some drawings and construction information concerning *Unknown No. 5*. The *Unknown No. 5* was a work barge property type. It had cement bilge ballast and the wreckage consists of some wooden framing with cement (DHPA ca. 1985). The actual length of the ship is unknown but the remaining portion of the hull measured 100 ft (30.5 m) in length by approximately 32 ft (9.8 m) abeam at its maximum in the rubble zone, which was located immediately to the north of the three main extant pieces (DHPA ca. 1985). *Unknown No. 6* is also a work barge property type. The actual and estimated specifications of the ship are currently unknown from review of the literature.

Archaeology. The wrecks of *Unknown No. 5* and *Unknown No. 6* were surveyed in July and August 2011. The site was surveyed by pedestrian surface survey, direct snorkel survey, and remote sensing across *Unknown No. 5*. Vessel *Unknown No. 6* was too shallow to conduct remote sensing survey and only a snorkel survey was conducted. *Unknown No. 5* and *Unknown No. 6* were located adjacent to each other. Historic documents provided conflicting information regarding which characteristics belonged to which arbitrarily named ship. From unpublished

notes and sketches, the two vessels have been more definitively labeled based on the cardinal directions and descriptions for each vessel from the first MCRS 1980s survey.

This survey noted that more of *Unknown No. 5* appears exposed and more of *Unknown No. 6* appears buried, compared to what was recorded in the 1980s. The site boundaries were determined from the 2011 survey data. The site area is defined as 500 ft (152.4 m) long and 350 ft (106.7 m) wide surrounding the main frames of both vessels. The two sections of main frame for *Unknown No. 5* measured 100 ft to 140 ft (30.5 m to 42.7 m) long by 38 ft (11.6 m) wide. The main frame for *Unknown No. 6* measured 240 ft (73.2 m) long by 38 ft (11.6 m) wide. The northernmost end of *Unknown No. 6* angled slightly toward *Unknown No. 5* wreckage, but is most similar to the structure of *Unknown No. 6* and therefore was measured as such. Both vessels are located in shallow water, but *Unknown No. 5* lies to the east and further offshore, whereas *Unknown No. 6* lies to the west and closer to the shoreline. Both vessels are designated as existing within one archaeological site (12La640); however, each vessel is discussed separately.

The wreck of *Unknown No. 5* lies at perpendicular angles because it has been disarticulated into two main pieces. One piece lies along a southeast to northwest heading and the other along a southwest to northeast heading. The vessel currently lies somewhat upright with its hull structure on the lakebed. The extent of the wreckage associated with *Unknown No. 5* could not be determined because of its proximity to *Unknown No. 6* and that vessel's associated structure. The structural parts of *Unknown No. 5* are the metal structural supports, metal sidewall remnants, wood frame and ribs, wood planking, and timbers. The planking and timbers may be the remnants of the former integral ballast structure composed of cement and heavy timbers that Ellis (1986a:101) mentioned. At the time of the 2011 survey, a piece of metal sidewall with a porthole was also observed. The frame and hull of this vessel is so disarticulated that it is unclear if these parts of structure are all from one vessel or from multiple vessels. The equipment and other machinery from *Unknown No. 5* appeared to have been removed.

Although the wreck of *Unknown No. 6* is mostly buried, it appears to have more surviving mass than *Unknown No. 5* and lies intact on its hull and keel along a south to north heading. The vessel consists of three main structural parts, remnants of metal beams that may have been structural supports, exposed above the waterline. The extent of its debris field beyond the exposed wreck structure is unknown because much is buried by sand and because of the proximity of *Unknown No. 5*. Some of these beams extend up out of the lakebed and others extend up from the lakebed and out of the water. Flat timbers were also observed amidship, along the western edge of the wreckage and in the center of the vessel. Some of the equipment and machinery from *Unknown No. 6* also appeared to have been removed; however, because much of this vessel was buried, the presence of intact machinery is unknown. Wreck items still present at the site of *Unknown No. 6* were metal pipe and hardware, such as spikes.

George F. Williams (12La639)

History. The *George F. Williams* was reported to have been scuttled in 1913 off of Chicago (Milwaukee Public Library 1959). The ship was reported as abandoned, was towed 400 ft (121.9 m) offshore, and was then sunk (Kohl 2001:286, 2008). The ship was owned by the Hayward and Avery Transit Company from 1891 to 1901 and the Gilchrist Transportation Company from at least 1901 to 1913 (National Archives 1883-1916, 1891, 1893, 1894, 1901, 1906, 1913). The *George F. Williams* was purchased by Sam Opinski from the Gilchrist Transportation Company for \$800 in March of 1913 (Konieczka 1989; National Archives 1913).

The *George F. Williams* was a steamer vessel type and a bulk-freighter property type. It was constructed in 1889 by F. W. Wheeler and Company at West Bay City (now Bay City), Michigan (Milwaukee Public Library 1959). The ship measured 280 ft (85.3 m) in length by 41.4 ft (12.6 m) abeam with a draft of 20.3 ft (6.2 m) and weighed 1888 gross tons (1918.3 mt) (Ellis 1986a:4). The *George F. Williams* was a large wooden vessel with a main frame similar in style and construction to the *F. W. Wheeler*. The frame consisted of a scarphed and stacked keelson; basically this was a steel capped wooden box (Ellis 1986b:17). The floor of the vessel contained six sub-keelsons that ran from stem to stern (Ellis 1986b:18).

Archaeology. The *George F. Williams* was surveyed in July and August 2011, and May 2012, utilizing both remote sensing and direct observation by snorkeling and SCUBA. The *George F. Williams* exists similarly to the way it was described during the 1980s survey, but now the water is shallower than was recorded in 1985 (Ellis 1986b:17). It still lies on its hull and keel (Figure 5). The shipwreck consists of main frame, sidewall sections, and machine components.

The vessel lies mostly buried with the port foreship sidewall present but detached from the main frame. The port midship sidewall is also still standing and extrudes slightly from the lakebed. The lower portion of the starboard sidewall lies collapsed on top of the main frame. The upper portion of the starboard wall, noted as missing in 1986 (Ellis 1986b:26), was not relocated as part of this survey. The bow section of the main frame and metal-covered keelson were fairly buried in sand. The bow appears to be intact, to the north and east of the port sidewall section. The stern section was more exposed, revealing the engine stand, engine support futtocks (separate curved or vertical wood used to make a rib or frame piece), and propeller. Some of the sub-keelsons were evident, where they were exposed from sand cover. Ribs and floor frames along the starboard side were also observed.

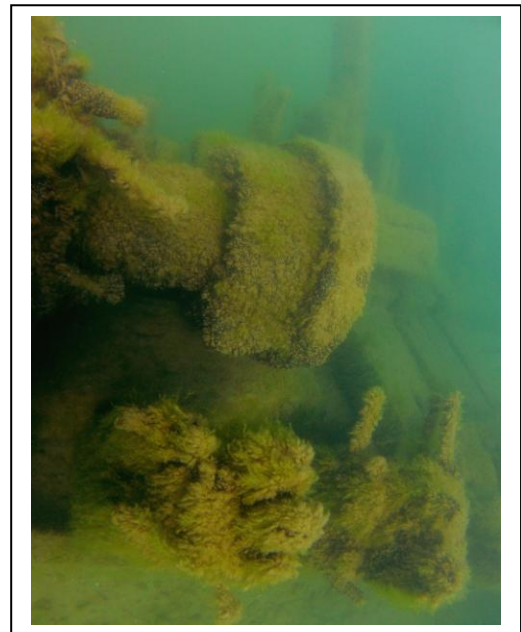


Figure 5. Photograph of part of the propeller shaft gear and hull on the *George F. Williams* (Kaufmann 2012).

The mechanical equipment still present at the time of this survey included the boiler, part of the cast iron engine stand, flywheel bearing blocks, propeller block, and propeller assembly. The boiler was very close to the surface. The upper portions of the boiler were covered with a

thin layer of algae and zebra mussels, primarily on the deeper part of the unit. The engine stand is still partially present, along with the portions of the flywheel bearing noted by Ellis (1986b). The metal portions of the engine stand, flywheel bearing blocks, propeller block, and propeller assembly were covered with zebra mussels. The uppermost blade of the propeller stands close to the water's surface. At least one third of the vessel appears buried, which is comparable to what was recorded in 1985. The site boundaries were determined from 1985 and 2011 survey data. The site area is defined as 1000 ft (304.8 m) surrounding the main frame. The exposed portions of the main frame measured 90 ft (27.4 m) long by 26 ft (7.9 m) wide.

Material Service (12La641)

History. The *Material Service* was constructed in 1929 in Sturgeon Bay, Wisconsin, by Leatham D. Smith for the Smith-Putnam Navigation Company and was named in honor of the Material Service Company (U. S. Department of Commerce 1936, 1937). The *Material Service* foundered under storm conditions on July 29, 1936, and 15 lives were lost (Milwaukee Public Library 1959). It had departed Lockport, Illinois, headed for South Chicago under Captain Charlie D. Brown, who perished when the vessel sank (DHPA 1985b; Milwaukee Public Library 1959). It was reported that a large wave washed over the ship causing it to list sharply and quickly, before much of the crew could react and get free of their bunks (Milwaukee Public Library 1959). At the time of the disaster the ship had a cargo of 2,500 tons (2540.1 mt) of sand or gravel. The *Material Service* was owned by Material Service Company of Chicago until it was lost in 1936. The loss was estimated at \$500,000. However, at least two salvage operations were conducted on the *Material Service*, one in late 1936 and one in 1945, but specifically what was salvaged at either time was not detailed (Milwaukee Public Library 1959; Milwaukee Sentinel [MS], 30 July 1945).

The *Material Service* is a barge vessel type and a self-unloader property type. The ship measured 239.7 ft (73.1 m) in length by 40.1 ft (12.2 m) abeam with a draft of 13.9 ft (4.2 m) and weighed 1077 gross tons or 736 net tons (1094.3 mt) (Milwaukee Public Library 1959). This vessel was operated by propeller with a twin diesel engine (BGSU 2012). At the time of its construction, the *Material Service* barge combined inventive structural and functional design elements into its system of self-unloading levers and pulleys. Additionally, the barge's system and low superstructure allowed it to travel through the Chicago River and Chicago Sanitary and Ship Canal without requiring bridge openings (Milwaukee Public Library 1959). Because of these innovative features the *Material Service* barge was a unique 20th century motorship.

Archaeology. The *Material Service* was surveyed by remote sensing and direct diver survey in July and August 2011 (Figure 6). It still lies fairly intact on its hull in an upright and articulated position. Its significant remaining features include the substantial intact mainframe; the remaining self-unloading levers, conveyors, and pulleys; the retractable A-frame; and intact machine components. The southern portion of the vessel (bow area) is intact from the exterior, but the interior bulkheads are partially collapsed. The northern (stern area) is also intact, but the upper deck and pilot house have been removed or destroyed at some time in the past. The lower stern area with rudder and propeller remains intact.



Figure 6. Photograph of a portion of the pilot house sidewall on the *Material Service* (Used with permission, Indiana Department of Natural Resources, Lake Michigan Coastal Program).

The holds are exposed and open on the deck. The deck and remaining super structure at the stern are fairly close to the water's surface. The sidewalls are intact but with several cracks that penetrate through the hull to the interior of the hold. The deck appears to be deteriorating through oxidation and weakening of the hull. The stern portion is missing most of the pilot house. Most of the surfaces of the wreck are extensively coated with zebra mussels and algae in the sunlit areas.

The interior of the vessel, such as the bulkhead supports in the central portion of the vessel, in the holds, do not appear to show much weakening. Bulkheads at the stern of the vessel do demonstrate the weakening similar to what had been reported earlier (DHPA 1985b); however, at the bow of the vessel, there has been substantial collapse of the deck plates. The opening (hatch), with a ladder that goes below deck, is partially obstructed because of the collapsed decking. Chunks of concrete previously reported on the bow (DHPA 1985b) were not present at the time of survey. They may have already collapsed completely into this part of the bow. This area was covered with sand, so determining the location of the cement was not possible. Other pieces of cement were present in the hold.

The mechanical equipment still present at the time of this survey was located primarily at the stern. This equipment included a rock crusher (with roller), pulley, and gears. Other pieces of equipment present were the self-unloader rail stands, boom rails, and vent. The unloading boom was not present and appears to have been salvaged, perhaps at the time of sinking (DHPA 1985b). Equipment at the stern, such as mooring bits, was still intact; however, while equipment and machinery below deck still exist, but they have been compromised by collapsing decking.

At the bow, deck hardware and equipment observed included rivets, deck brackets, cleats, handles, and a winch. Most of the loose hardware has been cemented to the decking by zebra mussels. While some deck equipment lies immediately beside the vessel, primarily to the west of the main frame, most of the deck equipment was reported as missing when surveyed in the 1980s

(DHPA 1985b). The stern still has scattered steel and pipes on deck, with numerous pipes and machinery in place below deck. The propeller assembly, with rudder, was still in place but the propeller was partially buried. At the time of this survey, remaining artifacts from the site were primarily larger pieces of pipe along the starboard side, as well as pipe and metal debris near the stern area. Also at the time of this survey, only one propeller was observed, but other divers to the site have said there were two propellers at one time.

Car Ferry No. 2 (12La642)

History. *Car Ferry No. 2* was owned by the Lake Michigan Car Ferry Transportation Company throughout its life and at the time of its demise (U.S. Lifesaving Service 1907:45). The vessel was inaugurated into service in the fall of 1895 (Hilton 1962:189) (Figure 7). This ship was an open deck barge that carried freight cars from Peshtigo and Milwaukee to Chicago in association with the Wisconsin & Michigan Railway (Hilton 1962:193; Milwaukee Public Library 1959). The ship was one of several barges that were towed by the tugs *J. C. Ames* and *S. M. Fischer* (Milwaukee Public Library). When the vessel capsized the cargo included 28 rail cars, of which half contained iron ore and the other half contained telegraph poles and lumber, located on four tracks (Milwaukee Public Library 1959). More recently, *Car Ferry No. 2* has also been called *Barge No. 2* (Kohl 2001:286; 2008).

The *Car Ferry No. 2* sank in 1906 when it capsized from a northeast gale; three lives were lost (Hilton 1962:188-194; U.S. Lifesaving Service 1907:45-46). This barge, under the operation of Captain O. C. Olson, capsized after being released by the tugboat *J. C. Ames*, which was operated by Captain W. H. Welcher (Hilton 1962:194; Milwaukee Public Library 1959; U.S. Lifesaving Service 1907:45-46). Apparently, *Car Ferry No. 2* had taken on a fair amount of water in its hold so that the Captain of the *J. C. Ames* was concerned for the safety of his vessel. Another tug, the *Perfection*, came to assist, but not before *Car Ferry No. 2* overturned (U.S. Lifesaving Service 1907:45-46). After losing the train cars to the bottom of the lake, the vessel reportedly remained afloat with the keel upward for a short time and then stranded near the breakwater (Hilton 1962:195). The next spring, the Army Corps of Engineers towed the barge farther out onto the lake to remove it as a navigation hazard and finally dynamited part of the vessel in August 1907 (Hilton 1962:195).



Figure 7. Historic photograph of the *Car Ferry No. 2* (Used with permission, C. Patrick Labadie Collection, Thunder Bay National Marine Sanctuary, Alpena, MI).

Car Ferry No. 2 was a barge vessel type and a train ferry property type. It was constructed in 1895 by James Davison at West Bay City (now Bay City), Michigan (Milwaukee Public Library 1959). The ship measured 309.9 ft (94.5 m) in length by 44.2 ft (13.5 m) abeam with a draft of 12 ft (3.7 m) and weighed 1548 gross tons or 1462 net tons (1572.8 mt) (Hilton 1962:266; Milwaukee Public Library 1959). However another source lists vessel length for the *Car Ferry No. 2* as 320 ft (97.5 m) (Mills 1910:212). *Car Ferry No. 2* was a massive wooden and unpowered rail ferry whose capacity was four rail tracks and 28 cars (Hilton 1962:266; Milwaukee Public Library 1959). This vessel exemplified changes in wooden vessel design at the end of the nineteenth century; consequently the wreck site has the potential to answer questions about the nature of design for such vessels as well as their seaworthiness (Ellis 1987a:4).

Archaeology. The *Car Ferry No. 2* was surveyed in July and August 2011 using remote sensing and direct diver survey. The *Car Ferry No. 2* still lies on its deck with its hull facing the lake surface, along a south to north heading. It is still very much disarticulated. The vessel consists of the main frame, sidewall sections, and specific machine components. The northern portion of the site (bow area) is more dispersed and more buried by sand than the southern, stern section. The vessel hull appears similar to what was described in the 1980s (DHPA 1985c; Ellis 1987c), with the hull upside down, the starboard sidewall lying outward, and port sidewalls lying inward. The bow sidewalls have separated from the main frame and lie to either side of the main frame. The stern sidewalls have not completely separated from the main frame, but have folded to either side of the main frame. The starboard-side stern sidewall has folded outward away from the stern area main frame, while the port-side stern sidewall has folded inward on top of the stern area main frame.

Few remnants of mechanical equipment were still present at the time of this survey. Artifacts observed at the site were numerous pieces of cable, metal pipe, rail equipment, track equipment, nuts, bolts, railroad track spikes, and anchor chain. In addition, large pieces of stone ballast were observed on the wreck. The pulley with cable at the stern, recorded in 1986, was not present at the time of the 2011 survey. The site boundaries were determined from the 2011 remote sensing survey data. The site area is defined as 1900 ft (579.1 m) long and 1000 ft (304.8 m) wide surrounding the main frame. The main frame and sidewall areas measured 310 ft (94.5 m) long by 150 ft (45.7 m) wide.

Summary

From the field survey, nine sites were positively relocated, one was tentatively relocated, and four previously recorded sites were not relocated. Sidescan remote sensing proved to be a very effective and efficient way to identify and document sites within a very limited time frame. To supplement the remote sensing data, underwater digital photography and videography were effective in providing a more robust documentation of individual features of the sites recorded. Several potential new sites were also identified. Remote sensing and direct survey methods produced data to verify the condition of the shipwrecks for archaeological documentation and management considerations. Most of the wreck structures at all of the sites were inundated by

sand, covered with zebra mussels, and inhabited primarily by round goby fish. The zebra mussel coverage made it difficult to assess the integrity of specific features, structure, or machinery.

In general, recommendations to the LMCP began with encouraging additional documentation of the sites and additional survey to relocate those sites that were not identified as part of this survey (Kaufmann 2012). Considering that the goals are conservation and preservation of these submerged cultural resources, a general recommendation was to install boat mooring buoys, specifically for boats to tie off to, for those sites that are frequented by the public, such as the *Car Ferry No. 2* and the *Material Service*. Marker buoys, smaller buoys that are not intended for boats to tie off on, are recommended for other sites to avoid dragging anchors or fishing tackle through these sites. Other recommendations included monitoring of these nautical sites on a regular and annual basis through the use of both indirect remote sensing survey and direct survey (Kaufmann 2012). The use of photography and videography as an objective manner to documenting the status of the sites was suggested.

Of the nine sites relocated as part of this survey, the *Material Service* has the most historical information available regarding its past and use. It is one of the most unique vessels in Indiana's territorial waters of Lake Michigan. It also has some of the best integrity of the vessels surveyed and definitely has potential to contribute to our understanding of construction features for this class of vessel. Because this site has substantial above-lakebed structure, it is frequently visited by divers. In consideration of the goals for conservation and public use, this site was recommended for a National Register of Historic Places (NRHP) nomination to bring recognition to the site as a historic resource and also from an ecotourism perspective. The NRHP nomination for this site has been submitted and is currently undergoing the review process.

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A DATA DEFICIENT REGION: AN ARCHAEOLOGICAL SURVEY OF BLACKFORD COUNTY, INDIANA

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[Editors' note: To be consistent, site numbers will be written, for example, as 12W245, exceptions being when county abbreviations with an "I" before the numbers, such as Allen (Al) or Clark (Cl). Counties such as the latter will be designated with a space between the 12 and the county abbreviation and a space between the county abbreviation and the site number, such as 12 Bl 219 in the below article. This is done so that the reader understands that the site is from Blackford County (Bl), and the number of the site is 219, rather than 1219.]

Abstract

The Applied Archaeology Laboratories (AAL) at Ball State University conducted a data enhancement project for archaeological resources in Blackford County, for a FY2011 Historic Preservation Fund Grant (Grant # 31921-4). Approximately 915 acres (370.3 hectares) of agricultural land were surveyed, and 179 new archaeological sites were recorded. The survey recovered 256 prehistoric artifacts and 1,339 historic artifacts from 16 parcels of land within northern Blackford County. Cultural periods that are represented in the artifact assemblage include Early Archaic, Middle Archaic, Late Archaic, Early Woodland, late Middle Woodland-early Late Woodland, and Late Woodland/Mississippian components from the pre-contact era. The average site density recorded for the project area for pre-contact sites was one site per 6.58 acres.

Introduction

The Applied Archaeology Laboratories (AAL) at Ball State University conducted a FY2011 Historic Preservation Fund Grant to survey portions of Blackford County, Indiana. The project involved a pedestrian survey of approximately 915 acres (370.3 hectares) of agricultural land. The main goals of the project were to increase the site database for the county (prior to this survey, there were 105 sites in SHAARD, the Indiana State Historic Architectural and Archaeological Research Database), construct a cultural chronology for the county, refine settlement patterns of the pre-contact era, and enhance our understanding of the early Euro-American period. The Salamonie River Valley and northern half of the county were targeted for this project because they had not been systematically surveyed. In addition to the large-scale survey, three reported mound sites were investigated. An attempt was made to gain landowner permission to survey agricultural fields that were once a part of the Godfroy Reserve; however only one landowner gave permission to survey.



Figure 1. Location of Blackford County within the State of Indiana (YellowMaps World Atlas 2012).

Background

To provide a framework for interpreting the data collected during this project, a review of the natural and cultural setting was undertaken. The background information presented in this paper includes environmental and archaeological information concerning Blackford County and the Salamonie River valley.

Natural Setting

Blackford County is located in central Indiana (Figure 1) and is bounded to the east by Jay County, to the south by Delaware County, to the west by Grant County and to the north by Wells County. The county is approximately 106,022 acres (42,905 hectares) in size (Kluess 1986). For the proposed research the north-northeastern half of the county and the Salamonie River Valley which included approximately 34,800 acres (14,083 hectares) was targeted.

Blackford County is within the general physiographic unit known as the Tipton Till Plain, an area of low relief with extensive areas of ice-disintegration features (Gray 2000). This gently rolling, almost featureless plain is almost entirely composed of glacial till and only slightly modified by post glacial stream erosion. The flat till plain is broken by end moraines, eskers, esker troughs and meltwater drainages (Schneider 1966:49-50).

The Salamonie River and the Big and Little Lick Creeks are the major water sources running through Blackford County; however, there are also many other smaller streams and creeks. The Big and Little Lick Creeks drain into the Mississinewa River. The Salamonie and Mississinewa Rivers are tributaries of the Wabash River watershed which acts as a drainage system for two-thirds of the state flowing in a northeast-southwest direction (Hale 1966:92; Schneider 1966:50). The Wabash River eventually deposits water and soil from Blackford

County into the Ohio River, which is then ultimately transported to the Gulf of Mexico (Hale 1966:92).

Per Cantin (2008), no known chert sources are recorded in Blackford County or adjacent counties. However, nearby Huntington and Wabash counties offer sources of Liston Creek chert. Stratigraphically, Liston Creek chert occurs in nodules and is a member of the Wabash Formation of the Niagara series of the Silurian system (Cantin 2008:54). Liston Creek chert consists of various shades of grey ranging from medium to very light grey which can take the “form of bands, variegations, mottles, amorphous ‘blobs’, or irregular-angular patches” (Cantin 2008:55). Texture is variable, ranging from coarse to medium fine; and luster ranges from sparkling, to dull and flat, to slightly lustrous (Cantin 2008:55). Possible fossil fragments occur as small rectangular and ovoid calcitic or siliceous flecks that are dispersed throughout Liston Creek chert, and crystalline vugs are quite common (Cantin 2008:55). Temporally, Liston Creek chert is found in all cultural periods in the Wabash basin (Cantin 2008:55).

Cultural Setting

The natural setting of Blackford County demonstrates a hospitable environment following the retreat of the Wisconsin glaciation. Site components in the county include Paleoindian through the Historic period. The most frequently identified cultural affiliation is Historic, followed by Early Archaic and Late Archaic.

Archaeological investigations in Blackford County have been predominantly oriented toward surface surveys, and only a small percentage of sites have been tested or excavated. Few major surveys have been conducted within and around the current research universe, and include portions of the drainage basin of the Big and Little Lick Creek. The major surveys performed within the region consist of a reconnaissance survey in Hartford City resulting in three sites (12 Bl 108 to 110) with site 12 Bl 108 having a diagnostic Kirk Corner Notched projectile point (Jeske and Stillwell 1994a). Also, from a reconnaissance survey for a proposed project near Hartford City resulted in nine sites inventoried (Jackson and Vosvick 2006). Finally, south and west of Montpelier a reconnaissance survey of a proposed project resulted in thirteen sites inventoried (Stillwell 2003). Excavations within Blackford County consisted of an archaeological test excavation of site 12 Bl 110 to determine if any historic features might be present; however, none were found (Jeske and Stillwell 1994b). One major excavation of a burial site (12 Bl 1 and 12 Bl 2) was conducted in 1933, and a total of 18 burials, a refuse pit, two fireplaces, and numerous lithics and bone tools were uncovered (Black 1933, 1935).

The native peoples of what is now Blackford County were the Miami Indians. Chief Francois Godfroy, half French and half Miami, became an important individual in Tribal affairs and an influential ambassador between the Miami Nation and the United States after the War of 1812 (Glenn 1979:19). With the Treaty of St. Mary’s in 1818, the United States government granted land to Chief Francois Godfroy, now known as the Godfroy Reserve (Hill 2005:12). The Godfroy Reserve was an allotment of six sections on the Salamonie River (Glenn 1979:19). Guernsey (1932) records the Godfroy Reserve in the far northeastern portion of the county and that location would have been important during the historic era and potentially the pre-contact era. It was thought that Godfroy chose this specific location because it was already being utilized for trapping (Glenn 1979:21). In 1826 Godfroy received permission to sell two sections back to the government (Glenn 1979:21). In 1832 a house for Chief Godfroy was built on the Reserve by the government (Hill 2005:12). In 1835 Godfroy moved from the reserve to his other home in

Mount Pleasant, Indiana, and by 1836 the reserve was sold to agents of a fur company: Richard Suydam, Daniel Jackson, and Alexander Kevar (Glenn 1979:21). The Godfroy house was dismantled a year after Godfroy's death, and the bricks were used to build a house in nearby Pennville in Jay County (Glenn 1979:22). From the year of obtaining Godfroy's reserve to after Godfroy's death, small contingents of Miami Indians lived in a village near Godfroy's house (Glenn 1979:25). After the death of Godfroy in 1840, the ties between the Miami Indians and the Euro-American settlers disbanded (Hill 2005:12). Glenn discusses that there is evidence of at least one prehistoric site including earthworks on the Godfroy Reserve; if a survey were to be conducted more sites could be found (1979:25).

The first Euro-American settlers in Blackford County were Benjamin Reasoner and his family in 1831. The Reasoner family eventually settled in the southwest corner of Lick Creek valley of what is currently a part of Blackford County. The family's residence eventually became the epicenter of community life for other settlers and their families. Blackford County, named after Supreme Court Judge Isaac Newton Blackford, was officially organized in 1839 and was divided into four townships. These townships were: Washington, Licking, Harrison, and Jackson. Three of the four townships were named after important figures in American history, while Licking Township was named in regards to the Big and Little Lick Creeks (Hill 2005:12).

An economic boom occurred for Blackford County when natural gas and oil were discovered in the town of Montpelier in 1887. Between 1870 and 1900 the population tripled within the county as the natural gas and oil industry bloomed in Montpelier giving it the name "Oil City" and glass factories were built in Hartford City (Hill 2005:12). Unfortunately, economic decline occurred 20 years later. Blackford County is made up of mostly rural areas today.

Archaeological Survey

Introduction

Approximately 915 acres (370.3 hectares) of agricultural land were surveyed by pedestrian transects between October 14, 2011 and February 27, 2012. The survey sampled 915 acres of till plain and moraines. The survey documented 179 new archaeological sites and recovered 256 prehistoric artifacts and 1,339 historic artifacts.

The pedestrian survey was conducted by Ball State University's Applied Archaeology Laboratories staff and students and took a total of eleven days to complete stretched over a period of five months. The field survey was executed using pedestrian transects spaced at 10m intervals. The survey interval was reduced to 5m when artifacts were encountered. The areas surveyed by pedestrian transects had between 50 percent and 90 percent ground surface visibility. All artifacts were collected and bagged by site specific provenience, with the exception of brick and FCR which were counted and noted in the field. All collected artifacts were taken to the AAL laboratory for processing, identification, and analysis. Artifacts were cleaned, classified, and cataloged. Diagnostic point types were classified using Justice (1987). Lithic raw materials were identified by comparison with reference samples and published descriptions on file in the AAL laboratory (Cantin 2008). All chert identifications were made microscopically at 10x or greater.

Over 20 students in Ball State University's Department of Anthropology participated in either pedestrian surveys or lab work during the duration of this project, and they were supervised by qualified archaeologists in the Applied Archaeology Laboratories. Student participation in this project was invaluable and provided multiple and varied learning experiences for all students involved.

Results

Approximately 915 acres were surveyed during this project, and 179 new archaeological sites were recorded. Sixteen parcels in Blackford County were surveyed. The survey documented the human occupation of Blackford County beginning from the Early Archaic period and extending until the Historic period. Considering the limitations of Phase I surveys, it is presumptuous to assign functionality to sites identified solely by pedestrian survey; site types were therefore not defined beyond isolates and scatters. However, it appears likely based upon the variation in artifact classes discovered on the sites that multiple sites types were represented. All 179 sites were found on till plain and moraine landforms, which is the predominant landform in Blackford County.

Artifacts

As noted, this project recovered 256 prehistoric artifacts and 1,339 historic artifacts (Table 1). The majority of prehistoric artifacts consisted of lithic debitage. The edge modification to several flakes indicates that debitage can function as expedient tools. The majority of formal lithic tool types were projectile points dating to the Early Archaic, Middle Archaic, Late Archaic, Early Woodland, late Middle Woodland-early Late Woodland, and Late Woodland/Mississippian periods (Table 2; Figures 5-10). Other stone tools consisted of endscrapers, groundstone tools, and core tools. Historic artifacts included a variety of ceramics, glass, metal objects and brick (1650 to present).

In addition to the usual historic period artifacts (glass, ceramics, metal) recovered in large-scale pedestrian surveys such as this, a number of doll pieces including heads, legs, and hands were discovered in Survey Areas 7 and 16. Figure 2 shows a representative sample of the doll pieces that were found. The doll pieces from site 12 Bl 219 date from ca. 1860 to 1940, and the soapstone statue from site 12 Bl 320 may date to the Art Deco period ca. 1920-1940 (Angione et al. 2007; GreatArt 2012; Tubbs et al. 2009). Soapstone has been used for millennia for decorations, carvings, and statues throughout the world and Euro-Americans have been using soapstone since the 17th century (GreatArt 2012). This particular statue's function is unknown but it may have been part of a chess set or part of a larger art sculpture that was subsequently broken. All three doll pieces (12 Bl 219-51, 52, and 53) are bisque porcelain and date to the late 19th and early 20th century (Angione et al. 2007; Tubbs et al. 2009). The doll leg, 12 Bl 219-51, has a faded impressed maker's mark near the joint of the leg and appears to be the mark of Hermann Steiner, a Swiss doll maker from Germany. The leg has a date range of ca. 1860 to 1940, but based on the style probably dates to ca. 1911 to 1930 (Angione et al. 2007; Tubbs et al. 2009). The hand also has a date range of ca. 1860 to 1940. The doll head is a bonnet head style and has a date range of 1890 to 1930 (Angione et al. 2007; Tubbs et al. 2009).



Figure 2. Doll fragments from site 12 BI 219 and a partially complete figure of a soapstone statue from site 12 BI 320 (photo by Kristin Kjeldsen).

Numerous examples of whiteware, stoneware, porcelain, and ironstone were encountered in the surveys, several of which were decorated in some fashion. Figure 3 and 4 show a sampling of the variety of ceramics that were found and the types of decoration present. 12 BI 219-40 is ironstone with flow blue decoration and 12 BI 219-41 is hand-painted ironstone; both date between 1800 and 1890 (Feldhues 1995). The rest of the items featured are decorated whiteware and date from the 1820s to the present (Sutton and Arkush 2009). 12 BI 219-04 is a whiteware rim with red sponge decoration that dates between 1840 and 1860 (Feldhues 1995). 12 BI 219-15 is a piece of whiteware body with a green transfer print which dates between 1830 and 1890 (Feldhues 1995). Finally, 12 BI 220-10 is a piece of whiteware with blue flow decoration that dates between 1825 and 1862 (IMACS 1992).



Figure 3. Assorted decorated ceramics from sites 12 BI 219; 12 BI 220; and 12 BI 302 (photo by Kristin Kjeldsen).

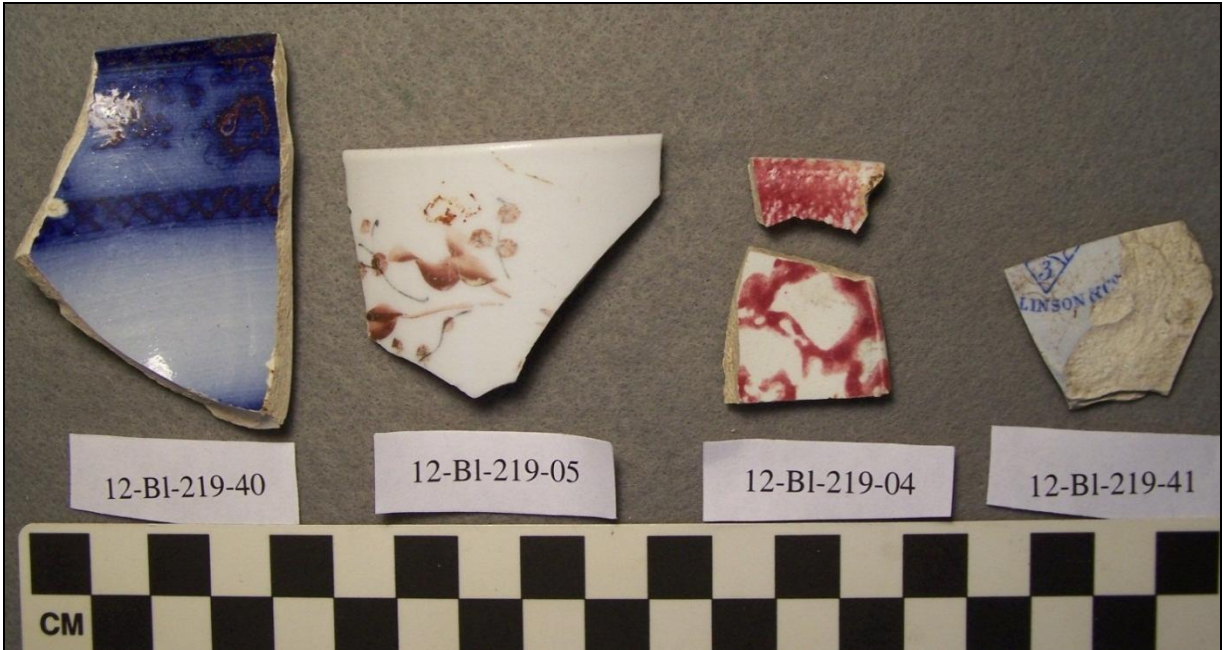


Figure 4. Assorted decorated ceramics from site 12 BI 219 (photo by Kristin Kjeldsen).

Table 1: Artifacts Recovered			
Prehistoric	No.	Historic	No.
Projectile Points	14	Ceramics	600
Biface, Non-Hafted	18	Container Glass	571
Core	8	Flat Glass	48
Endscraper	2	Metal, Unidentified	28
Flake, Modified	17	Metal, Nails	13
Flake, Utilized	11	Metal, Wedge	1
Flake, Proximal	16	Metal, Axe Head	1
Flake, Shatter	153	Metal, Spoon	1
Angular Shatter	15	Metal, File	1
Groundstone Tool	2	Metal, Pipe	2
		Metal, Horseshoe	2
		Metal, Spark Plug	1
		Metal, Nut and Bolt	1
		Metal, Belt Buckle	3
		Metal, Bolt	3
		Metal, Pocket Knife	1
		Metal, Shovel	1
		Metal, Name Plate	1
		Metal, Gear	1
		Metal, Shotgun Shell	1
		Brick	19
		Tile	5
		Stone, Lintel	2

Table 1: Artifacts Recovered			
Prehistoric	No.	Historic	No.
		Cement	1
		Slate	1
		Slag	4
		Coal	4
		Charcoal	5
		Cannel Coal	1
		Bone	2
		Tooth	1
		Shell	13
		Total	1339

Table 2: Projectile Points by Cultural Time Period	
Cultural Period	Projectile Point Styles
Early Archaic	Kirk Corner Notched (2), Thebes Cluster (1)
Middle Archaic	Raddatz (1)
Late Archaic	Late Archaic stemmed (1), Matanzas (1), Merom Cluster (1), and Etley (1)
Early Woodland	Robbins (1)
late Middle Woodland/ early Late Woodland	Steuben Expanded Stemmed (2)
Late Woodland/ Mississippian	Triangular Cluster (2)

Figure 5. An Early Archaic Kirk Corner Notched projectile point from site 12 B1 235 (photo by Kristin Kjeldsen).





Figure 6. A Middle Archaic Raddatz projectile point from site 12 B1 289 (photo by Kristin Kjeldsen).



Figure 7. A Late Archaic Matanzas projectile point from site 12 B1 185 (photo by Kristin Kjeldsen).



Figure 8. An Early Woodland Robbins projectile point from site 12 Bl 142 (photo by Kristin Kjeldsen).



Figure 9. A late Middle Woodland-early Late Woodland Steuben Expanded Stemmed projectile point from site 12 Bl 153 (photo by Kristin Kjeldsen).



Figure 10. A Late Woodland/Mississippian Triangular projectile point from site 12 Bl 300 (photo by Kristin Kjeldsen).

Chert

The lithic artifacts were dominated by Liston Creek cherts (37.50 percent) (Table 3). There are no naturally occurring Liston Creek chert outcrops in Blackford County, but Cantin shows Liston Creek chert occurring in nearby Huntington, Wabash, and Miami Counties (Cantin 2008:9). Only four of the projectile points were identified as being Liston Creek (12 Bl 276-01, 12 Bl 300-01, 12 Bl 311-01, and 12 Bl 322-01).

Jeffersonville chert was the second highest identified material (7.21 percent) (Table 3). Jeffersonville chert outcrops in Decatur, Bartholomew, Jennings and Jefferson counties and these are a significant distance (>130 km) from the project area (Cantin 2008). Muldraugh chert is the third most common type of chert material (6.25 percent). Muldraugh chert is only known to outcrop in Harrison County, Indiana along the Ohio River and this is a significant distance from Blackford County (>275 km) (Cantin 2008:9, 56). Ditney chert is the fourth most common type of chert material (5.29 percent) (Table 3). Ditney chert occurs in only one reported location in the state of Indiana in the extreme southwest part of the state in Warrick County and this is also a significant distance from Blackford County (>300 km) (Cantin 2008:9). Four of the recovered projectile points were made from Ditney (12 Bl 142-01, 12 Bl 233-01, 12 Bl 235-01, and 12 Bl 293-01). Exotic cherts, chert that outcrops more than 80 kilometers from Blackford County, represent 48.07 percent of the total lithic material collected. With unknown chert materials excluded, exotic cherts represent 43.25 percent of chert material collected. Local cherts (Liston Creek, Fall Creek, Laurel, and Kenneth) represent 51.93 percent of the total lithic material collected. With Liston Creek excluded, local cherts only represent 10.58 percent of the total.

Table 3: Chert Raw Materials Found in the Survey Area					
Chert	No.	%	Chert	No.	%
Attica	8	3.85%	Indian Creek HT	2	0.96%
Bryantsville	5	2.40%	Jeffersonville	15	7.21%
Cataract	2	0.96%	Jeffersonville HT	1	0.48%
Delaware	7	3.37%	Kenneth	7	3.37%
Derby	5	2.40%	Laurel	10	4.81%
Derby HT	1	0.48%	Liston Creek	78	37.50%
Ditney	11	5.29%	Liston Creek HT	8	3.85%
Fall Creek	5	2.40%	Muldrough	13	6.25%
Flint Ridge	2	0.96%	Quartzite	1	0.48%
Flint Ridge HT	1	0.48%	Stanford	1	0.48%
Holland	3	1.44%	Unknown	10	4.82%
Holland Dark Phase	2	0.96%	Upper Mercer	2	0.96%
Indian Creek	6	2.88%	Wyandotte	2	0.96%
			Total	208	
HT = Heat Treated					

Sites

Of the 179 archaeological sites, 139 had unidentified prehistoric components (Table 4). The identified pre-contact components consisted of Early Archaic, Middle Archaic, Late Archaic, Early Woodland, late Middle Woodland-early Late Woodland, and Late Woodland/ Mississippian. Forty-seven sites had historic components.

Table 4: Site Components		
Component	No.	Comment
Unidentified Prehistoric	139	17 Multicomponent (13 Historic) (2 Early Archaic) (1 Middle Archaic) (1 Late Archaic)
Early Archaic	3	3 Multicomponent (3 Unidentified Prehistoric) (1 Historic)
Middle Archaic	1	1 Multicomponent (Unidentified Prehistoric)
Late Archaic	4	2 Multicomponent (Unidentified Prehistoric)
Early Woodland	2	0 Multicomponent
Middle Woodland	2	0 Multicomponent
Late Woodland/ Prehistoric	2	0 Multicomponent
Historic	47	14 Multicomponent (13 Unidentified Prehistoric) (1 Early Archaic)
Total	200	

The frequency of identified components encountered in the project area was similar to what had already been identified in Blackford County. One new cultural period (Middle Archaic)

was discovered, and almost every cultural period was represented with the exception of the Paleoindian period.

Historic Settlement

Results from the survey were not able to elucidate historic Native American or early Euro-American settlement within the study area. No artifacts were discovered that were definitively from historic Native American occupations, and only a few dated to an early Euro-American time period. Thirty-nine sites contained historic components, a few of which were large historic scatters.

Density

The density and distribution of sites are important for modeling and prediction. The project documented an average one prehistoric site per 6.58 acres and an average density of one prehistoric artifact per 0.279 per acres surveyed.

Blackford County Mound Survey

Introduction

The proposal for this project included the documentation of two mounds, one recorded in the SHAARD database (12 Bl 71), and one was reported to be located in the Godfroy Reserve. This section covers the archaeological documentation of these two mounds, and one additional mound found in the General Land Office Survey (GLO) Notes while researching for these two mounds.

Background

The first report of a mound in Blackford County appeared in an early record as “a mound about 10 feet high and 140 to 150 links in diameter at [the] base” reported in 1822 (General Land Office Surveys 1795-1840). The site was later designated as 12 Bl 71. The next mound report was recorded north of 12 Bl 71. This mound was not previously recorded in the SHAARD database. Since then, earthworks have been reported in the area (Glenn, 1979:25, and 1980:22-23).

12 Bl 71

Mound 12 Bl 71 is located in the southern part of the county. This mound was reported in 1822, described as being, “A mound about 10 feet high and 140 to 150 links in diameter at [the] base” (General Land Office Surveys 1795-1840:355). The current landowner to the east of the reported mound granted permission to examine his fields. The current landowner to the west declined to respond to our letter requesting permission to survey the property adjacent to the purported mound; however, from the road, no mound was visible, and the lot was highly disturbed. There is a definite mound-like protuberance from the landscape on which the road was constructed. Photographs were taken of the reported site for documentation. If permission to survey can be

obtained for the parcel belonging to the landowners to the west of the mound, further investigation would be necessary to determine if the reported mound still exists.

Unrecorded and Newly Discovered Mound

The second mound is located in the northern part of the county. This mound was recorded in 1822 (General Land Office Surveys 1795-1840:388). We were not able to obtain permission from the landowners to survey this mound; archaeologists did take pictures from the road for documentation. From the road, it was seen that there were mound-like qualities to the location; however, as with 12 Bl 71, the road was constructed on top of this feature and the agricultural fields on either side of the road were heavily disturbed.

An alternative hypothesis for the existence of this mound is the possibility that the GLO surveyor created the mound himself when he set a reference post. The surveyor may have created the mound out of sod from the prairie when his section line intersected the reservation line thus marking a significant location along his section line. If the prairie was treeless at that time, the surveyor may have erected a mound out of sod about three feet high, and stacked layer upon layer in a pyramid shape (Illinois State Museum 2011; McClain and LaGesse 1997). This explanation may make more sense than the unlikely conclusion that two mounds were on the exact same line as surveyed. If landowner permissions can be obtained, the authors recommend further archaeological investigation into this reported mound.

Reported Mound in Godfroy Reserve

The location of the reported mound in the Godfroy Reserve is unknown because archaeologists have not been granted permission to survey the property, and the area where the mound is reported is heavily wooded. We were not able to obtain permission from the landowners to survey this mound area; however, pictures were taken from the road for documentation. There was no mound visible from the road, but there was one geographical oddity that may prove to be earthworks. If landowner permission can be obtained, further archaeological investigation into this reported mound is recommended.

Discussion

Site Density

The densities and distributions of sites are important for modeling and prediction. In the current study not only was site distribution tracked by landform and cultural period, but the amount of the surface that was covered by individual sites was used to demonstrate the percentage of utilized surface by landform (Table 5). For example, five small lithic scatters on a given landform may utilize a smaller portion of the landscape than one large lithic scatter on another landform. The percentage of utilized landscape may provide a further refined perspective of how settlement occurred within the research universe.

Table 5: Site Densities and Distributions By Landform

Landform	# of acres	# of sites	Density	Distribution
Till Plain and Moraine	915	179	1 site per 5.11 acres	Sites cover 1.83% of surface area

Blackford County is predominantly comprised of Till Plain and Moraine landform, and all of the parcels of land investigated in this project were found on this landform. Floodplains also exist in the county, but only along the Salamonie River and the Big and Little Lick Creeks (Kluess 1986). We attempted to gain landowner permission to survey along the Salamonie River and four landowners granted permission for a total of 526 acres; however, none of these parcels had the visibility necessary to conduct surveys. Three landowners granted permission in the properties adjacent to the northern section of the Godfrey Reserve (Survey Areas 7, 8, and 9) and this was the closest that we came to the Salamonie River and floodplain landforms. Further testing along the Salamonie River is recommended if these landowners will grant permission and if other landowners on the southern side of the river would grant permission. The general project area of Blackford County is worthy of additional investigation and study.

There is a preference for silt loam texture soils at sites. 41.11% of sites are located on silt loams (n=74), 31.11% of sites are located on silty clays (n=56), and 27.78% of sites are located on clay loams (n=50). The sites from the Early Archaic period were all located on clay loams. The one Middle Archaic site was located on silty clay. Three sites from the Late Archaic period were on silt loams, and two were located on clay loams. The Early Woodland site was located on a clay loam. One site from the late Middle Woodland-early Late Woodland period was located on silt loam and the other was located on a clay loam. Both of the Late Woodland/ Mississippian period sites were located on silt loams. Of the prehistoric sites with diagnostic artifacts, there was a preference for clay loams (n=7) and silt loams (n=6), and only one was located on silty clay. The sites from the Historic period are most frequently found on silt loams (n=12), with silty clays (n=7) and clay loams (n=6) occurring in lower frequency.

Overall, somewhat poorly to moderately well drained soils (n=75) were the predominant drainage class with 41.67% of the sites occurring on these types of soils. 29.44% of sites were found on poorly drained soils (n=53), 27.22% of sites were found on moderately well drained soils (n=49), and only 1.67% of sites were found on very poorly drained soils (n=3). Of the diagnostic prehistoric sites, there was a preference for moderately well drained soils (n=7) and somewhat poorly to moderately well drained soils (n=6), and one was located on poorly drained soils. Very poorly drained soils were avoided within the sites that had diagnostic prehistoric elements. In the historic period there was a preference for somewhat poorly to moderately well drained soils (n=12), with poorly drained (n=7) and moderately well drained soils (n=6) occurring in lower frequency. Also, in the historic period very poorly drained sites were avoided.

Landform Chronology

Results from the 915 acres of survey show a heavy Early and Late Archaic presence in the county, as was documented before this survey. With the exception of the Paleoindian period, all cultural contexts were discovered on Till Plain and Moraine landform (Table 6). Attempts to gain landowner permission on the other landform in Blackford County (floodplain) were made,

but we were unsuccessful in obtaining the necessary permission or ground surface visibility. Floodplains only occurred along the Salamonie River and Big and Little Lick Creeks. Therefore, settlement patterns for the different cultural contexts are difficult to ascertain. Without a differentiation in landform type, Blackford County is predominantly only representative of one history of taphonomic, geomorphic, and pedogenic processes.

Landform	Site #s and Cultural Periods
Till Plain and Moraines	12 Bl 142 (Late Archaic) 12 Bl 153 (late Middle Woodland-early Late Woodland) 12 Bl 184 (Late Archaic) 12 Bl 185 (Late Archaic) 12 Bl 209 (Early Woodland) 12 Bl 227 (Early Archaic) 12 Bl 233 (Early Archaic) 12 Bl 235 (Early Archaic) 12 Bl 276 (Late Archaic) 12 Bl 289 (Middle Archaic) 12 Bl 293 (late Middle Woodland-early Late Woodland) 12 Bl 300 (Late Woodland/Mississippian) 12 Bl 311 (Late Archaic) 12 Bl 322 (Late Woodland/Mississippian)

Upon completion of fieldwork and artifact processing, we have been able to add to the cultural chronology of the county. One hundred and thirty-nine Unidentified Prehistoric sites were added along with eight Archaic sites (three Early Archaic, one Middle Archaic and four Late Archaic), six Woodland sites (two Early Woodland, two Middle Woodland and two Late Woodland), and 47 historic sites. Prior to this survey project the Middle Archaic period was not represented in the SHAARD database for Blackford County. In general, the Middle Archaic period is not well understood in the state of Indiana (Jones and Johnson 2008:5). The Lower Ohio River Valley evinces settlement patterns that favor valley and riverine settings and procurement strategies that focus on local resources and long-term base camps (Jefferies 2008). The Great Lakes region by contrast evinces long-distance mobility and resource gathering, with short-term base camps located near water sources (Lovis et al. 2005). In the Tipton Till Plain the Middle Archaic period is not well known, and Wepler and Cochran (1982) attribute this lack of knowledge to a misidentification of point types and a lack in clear archaeological reporting. Blackford County lies in the center of these three sub-regions and with only one site identified it is difficult and presumptuous to ascribe any kind of cultural behavior that might be associated with the site.

In addition, we were able to add six previously unidentified projectile points to the knowledge of Blackford County's prehistory. We also added a previously undocumented cultural period (Middle Archaic) to the cultural chronology of the county. The diagnostic Middle Archaic projectile point was a Raddatz point. Raddatz points have distinctive U-shaped notches with squared ears and the notches are typically "perpendicular to the main axis of the blade" (Justice 1987:67-68). Raddatz points typically have a rectangular shape at the haft element with a straight

basal edge (Justice 1987:68). Raddatz points have a date range from ca. 6000-3000 B.C. and are distributed throughout the Midwest and Great Lakes region (Justice 1987:68).

Public Outreach

On September 24 and 25, 2011, Ball State University's Applied Archaeology Laboratories took part in Mound State Park's annual Indiana Archaeology Month activities, including a poster display of the Blackford County survey. Ball State archaeologists also spoke with numerous Blackford County projectile point collectors that attended the Indiana Archaeology Month activities fostering public interest and awareness in this HPF Grant survey.

On April 17, 2012 a public presentation was given at the Blackford County Historical Society by AAL archaeologist Christine Keller and Department of Anthropology students Joseph Miller, Tori Kiefer, and Kristin Kjeldsen. The hour long presentation reviewed all aspects of the grant including background, methodology, and results. Both historic and prehistoric artifacts representative of newly discovered sites were available for the attendees to view. Over 50 people attended the presentation which included a question and answer session, and a short discussion of Indiana archaeology laws (Figure 11). Throughout this project there was broad support for the pedestrian surveys from the residents of Blackford County. Landowners who granted permission to survey their property were very enthusiastic and eager to have their fields surveyed. Landowners were deeply interested in the types of artifacts we found and how their property was used in prehistory and in Euro-American contact. Numerous personal phone calls were made with various landowners who expressed great interest in participating in the survey and shared with the authors the types of artifacts that had been surface collected on their property in the past. It became apparent that Blackford County has an active and involved Historical Society and a large collector community fascinated with their county's prehistory and past.



Figure 13. Residents of Blackford County and members of the Blackford County Historical Society attending the presentation on April 17, 2012 (photo by Christine Keller).

Conclusions and Recommendation

This project targeted the northern half of Blackford County and the Salamonie River Valley in Blackford County, Indiana. The project area was selected due to the lack of known archaeological sites in the state database (SHAARD). The goals of the project were to increase the site database, construct a cultural chronology for the county, refine settlement patterns of the precontact era, and enhance our understanding of the early Euro-American period.

Approximately 915 acres of agricultural land were surveyed during this project, and 179 new archaeological sites were recorded. The survey recovered 1,595 artifacts consisting of 256 prehistoric artifacts and 1,339 historic artifacts. The majority of the precontact sites were unidentified by cultural period, however many prehistoric cultural periods were documented. Six sites (five historic scatters and one prehistoric scatter) were recommended for further testing and 173 sites were recommended as not eligible for listing on the Indiana Register of Historic Sites and Structures or the National Register of Historic Places.

The survey added one previously undocumented cultural period to the county's history, in the form of a Middle Archaic Raddatz projectile point (12 Bl 289). Compared to previous large-scale surveys on the Tipton Till Plain (Smith et al. 2009), whose results show a greater occupation in upland areas than originally expected, Blackford County only represents Till Plain and Moraine landform. Because these results could be due to a number of different reasons, the general project area of Blackford County is worthy of additional investigation and study.

The average site density recorded for the project area for precontact sites was one site per 6.58 acres and an average density of one prehistoric artifact per 0.279 acres surveyed.

The project results suggest that precontact populations were using Blackford County in different ways and during different cultural time periods. Many factors could influence the project data including the locales that were surveyed, whether a parcel was tilled recently or not, and the lack of any large valley settings in the county which are preferable for human occupation. Further research into prehistoric landform usage is recommended within Blackford County.

Blackford County would benefit from further archaeological investigations such as this large scale pedestrian survey in both the southern portion of the county and also further investigation into the northwestern portion (i.e., Roll Quadrangle). Another avenue of investigation is through analysis and documentation of private projectile point collections from Blackford County to help fill in the gaps of the cultural chronology.

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SITE 12Da1007: INTERPRETING 9,000 YEARS OF OCCUPATION IN THE PRAIRIE CREEK BASIN

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Abstract

In 2009, Gray & Pape, Inc. conducted Phase II investigations at site 12Da1007 to assess its eligibility to the National Register of Historic Places. Investigations consisted of a combination of remote sensing, test unit excavation, plowzone removal, and feature excavation. Forty-two cultural features were identified and excavated, consisting of pit features and post molds. Diagnostic artifacts and a suite of radiocarbon dates suggest that site 12Da1007 was occupied over the past 9,000 years with archaeological components dating to the Early Archaic, Late Archaic, Early Woodland, Middle Woodland, Late Woodland, and Late Prehistoric periods. Prehistoric groups traveled to the area to exploit upland resources through hunting and gathering. Botanical evidence suggests that ancient people timed their visits during the late summer and fall. Site 12Da1007 has provided new information for south-central Indiana and upland utilization over a 9,000 year period.

Introduction

During the latter portion of 2009, Gray & Pape, Inc. conducted Phase II investigations at site 12Da1007 to assess its eligibility to the National Register of Historic Places. Fieldwork was conducted pursuant to Section 106 of the National Historic Preservation Act, on behalf of Indiana Department of Transportation as part of its ongoing environmental investigations of the I-69 highway corridor.

Located in Daviess County, Indiana (Figure 1), 12Da1007 is multicomponent, ranging in age from the Early Archaic through Late Prehistoric periods; however, Phase II investigations yielded research information specifically on the Middle Woodland, Late Woodland, and Late Prehistoric periods. A suite of 12 radiocarbon dates was obtained, ranging from 160 B.C. to A.D. 1440. Despite the temporary nature of the site occupations, site inhabitants engaged in long-distance interregional trading networks based on the presence of non-local, exotic chert types. Site 12Da1007 provides an overview of upland utilization over a 9,000 year period. This article examines the chronology of 12Da1007 and how it fits within the overall settlement and culture history of south-central Indiana.

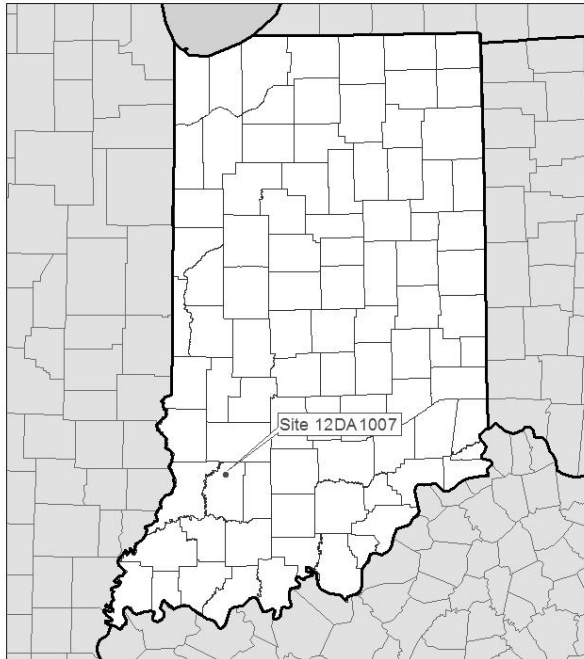


Figure 1. Location of 12Da1007 in Daviess County, Indiana. Map by Gray and Pape, Inc.

Site Setting and Description

The site is located on an incipient sand dune in the interior uplands of the Prairie Creek Basin, approximately 320 meters (m) east of Smothers Creek and encompasses an area of 20,700 square meters (m²). Windblown silt or loess covers much of the site, which was surrounded by low-lying swamps and marshes during the prehistoric occupation (Trader et al. 2010:1-10). The site falls within the Prairie Peninsula, a complex mosaic of oak-hickory forests and mixed-grass prairie.

Quaternary Landscape

In order to understand the attraction of the region to prehistoric inhabitants, it is necessary to briefly define the evolution and development of the Prairie Creek Basin. The geomorphic history of the region occupied by site 12Da1007 is complex and tied to the formation of the White River Drainage. Advance and retreat of ice sheets during the Illinoian and Wisconsin glaciation left their indelible mark upon the landscape (Thornbury 1965). A complex mosaic of landforms occupy the White River drainage, including alluvial plains underlain by a thick deposits of sand and gravel, dissected uplands consisting of bedrock covered with glacial till and loess, and broad level plains that represent a series of Pleistocene lake basins (Fraser and Gray 1992:1). The

Prairie Creek Lake Basin, likely began as a small tributary basin of the White River bedrock valley during the latter portion of the Tertiary. By the early Pleistocene, a number of streams merged with the Ohio River system which led to their subsequent entrenchment (Fraser and Gray 1992:13). By the late Pleistocene and the retreat of the Wisconsinian ice sheet, large-scale erosion of valley-train sediments occurred, resulting in draining the lake at the Prairie Creek basin, establishing a channel system on the broad lake plain (Fraser and Gray 1992:16). Around 8050 B.C., fluvial activity ended and a marsh was formed. Fraser and Gray (1992:17) suggest that the marsh was formed as a result of sand dune formation that dammed the mouth of Prairie Creek. As the climate stabilized and ameliorated, vegetation colonized the valley floor, resulting in the stabilization of sand dunes. Elevated above the surrounding marsh, dune crests became habitation sites for Paleoindian and subsequent groups entering the region (Fraser and Gray 1992:17). The shallow marshes would have been attractive to Native American groups, providing a wide variety of plant and animal species for exploitation (Trader et al. 2010:11). It is likely that the sand dune in which site 12Da1007 is found stabilized sometime during the Late Pleistocene and very early Holocene, based on the presence of Early Archaic projectile points. Marshes occupied the basin for thousands of years until around 2250 B.C., when the drainage reestablished itself in the basin, consisting of a low-lying plain subject to periodic seasonal flooding (Fraser and Gray 1992:19). This change occurred around the beginning of the Late Archaic period, no doubt contributing to the already changing subsistence and settlement patterns (Trader et al. 2010:11).

Phase II Investigations

Site 12Da1007 falls within the proposed I-69, Section 3 corridor, as well as east of and immediately adjacent to the Section 3 mainline corridor. Investigations consisted of a three-tiered approach, including geophysical survey, test unit excavation, and the mechanical removal of plowzone and the subsequent excavation of exposed cultural features (Figure 2).

Geophysical Survey

Prior to test unit excavation, the site was gridded into 52 20 x 20-m blocks over which a magnetometer survey was conducted by AMEC Earth and Environmental, Inc. The survey resulted in the definition of a number of magnetic anomalies indicating the location of potential cultural features. Two areas of historical and recent disturbances were recommended for avoidance, consisting of an old house and barn and an unknown utility. Based on the results of the geophysical survey, 29 separate anomalies were targeted for test unit excavation and plowzone removal (Trader et al. 2010:41).

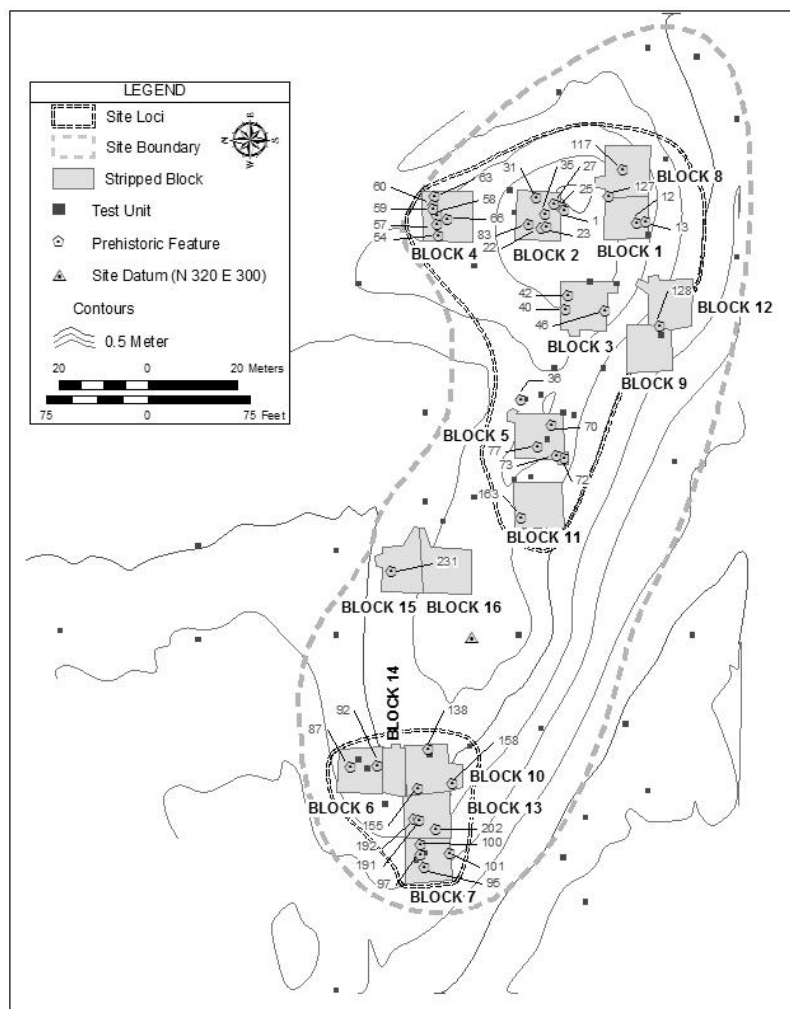


Figure 2. Site 12Da1007 showing eastern and western loci. Map created by Tim King, Gray and Pape, Inc.

Test Unit Excavation

Fifty-four 1-x-1 m test units were hand excavated across the site (Figure 2). Thirty-five units were excavated to assess the horizontal and vertical extent of the site, while 17 units were excavated to assess the potential for subsurface features based on the results of the magnetometer survey. As a result, two features were identified and 1,918 artifacts were recovered. Artifact densities were quite variable across the site and were used to reassess the overall site boundaries. Based on test unit excavations, site boundaries were reduced from 20,700 m² to 12,231 m² (Trader et al. 2010:41).

Plowzone Removal and Feature Excavations

Plowzone was removed from 16 Strip Blocks, in which approximately 1873 m² of plowzone was removed to expose mapped anomalies (Figure 2). A total of 248 potential features were identified during plowzone removal (including features identified during test unit excavation). Of these 42 (17%) were determined to be cultural, 21 of which were pit features and 21 were postmolds. A total of 1,816 artifacts were recovered from feature contexts, comprising forty-three percent of the total site artifact assemblage (Trader et al. 2010:47-61).

Non-cultural anomalies consisted of rodent burrows, tree roots, and historic disturbances. The tops of most features had been severely impacted by plowing, while tree roots and animal burrowing resulted in mixing feature contents (Trader et al. 2010:47-61).

Based on the results of test unit and feature excavation, the site consists of two distinct loci, an Eastern Locus and a Western Locus (Figure 2). These loci are disrupted by a 90-m zone of historic disturbance, consisting of the building and demolition of structures and the construction of a utility line. It is most probable that the prehistoric cultural deposits were continuous until the late nineteenth and early twentieth century's when they were interrupted by these disturbances (Trader 2010:264).

Artifact Assemblage

A total of 4,217 artifacts were recovered, representative of ten artifact classes including bifacial tools, cores, debitage, fire-cracked rock, ground/pecked/battered artifacts, miscellaneous artifacts, organic remains, pottery, projectile points, and retouched flakes. In addition, archaeobotanical remains were recovered from feature contexts (Trader et al. 2010:4).

Lithic Artifact Assemblage

The lithic artifact assemblage consists of both chipped-stone and ground/pecked/battered artifacts, which comprise over sixty-eight percent of the total artifact assemblage. Not surprisingly, debitage makes up over ninety-four percent of the total lithic artifact assemblage. Forty percent of the debitage assemblage consists of non-diagnostic flake shatter that can be produced at any time during the lithic reduction process. Biface manufacturing debitage is moderately represented and suggests that site inhabitants did engage in some biface production, or at least engaged in maintaining and resharpening tools. Initial reduction and cores are minimally represented suggesting that initial lithic reduction activities were not a main focus at the site. Few chipped-stone tools were thermally altered, suggesting that raw materials were not heat treated. Raw materials represented in the chipped-stone tool assemblage suggest that inhabitants were primarily obtaining semi-local cherts, such as Bryantsville, Holland, Indian Creek, and Perth, from primary source areas. The presence of exotic or foreign chert types, such as Wyandotte chert and Knife River Flint, suggests participation in large-scale regional interaction spheres (Trader et al. 2010:4).

Microwear analysis was conducted by Dr. Richard Yerkes of The Ohio State University. Analysis of chipped-stone tools suggests that butchering and skinning of animals occurred.

Additionally, utilized spear and arrowpoints were brought back to the site, discarded, and replaced (Trader et al. 2010:133-141).

The ground/pecked/battered artifact assemblage is composed of pitted stones, battered stones, and adzes. Pitted stones could have been used for processing nuts, or the bipolar reduction of stone tools. Battered stones could have been used for the stone tool manufacture and/or the processing of food items (Trader et al. 2010:128-132). Microwear analysis conducted on an adze suggests that it may have been used for chopping wood (Trader et al. 2010:141).

Ceramic Artifact Assemblage

The ceramic assemblage is composed primarily of sand or sand and grit tempered pottery with cordmarked surfaces that are diagnostic of Allison-LaMotte phase groups. Coarser tempered, more friable ceramics are similar to Late Woodland pottery defined for the region. One of the more interesting ceramic artifacts recovered was a single Havana Ware sherd (Figure 6) diagnostic of the Middle Woodland period. This specimen closely resembles the Naples Stamped series, Plain variety as defined by Griffin (1941, 1952) (Trader et al. 2010:146-154).

Archaeobotanical Assemblage

The archaeobotanical analysis was conducted by Dr. Jocelyn Turner of Paleoethnobotanical Laboratory. The archaeobotanical assemblage includes charred wood, bark, nutshell, and seeds. Mostly upland nut species are represented including *Quercus sp.*, *Carya sp.*, and *Juglans (sp.)*. Nutshell fragments are represented primarily by hickory. Wood charcoal is represented by a variety of tree species including American elm, Slippery Elm, Black Ash, White Ash, Hickory, Red Oak, White Oak, and Sycamore, which are primarily upland species. Few plant seeds were recovered. Cultivated species are representative of Eastern Agricultural Complex plants and consist primarily of *Chenopodium*; however, *Polygonum erectum* is also present. One of the more interesting aspects of the archaeobotanical assemblage is the amount of bark recovered from certain features, suggesting they might have functioned as smudge pits (Turner 2010:165-183).

Faunal Assemblage

Few faunal remains were recovered during Phase II investigations and consist primarily of small unidentified fragments. Over eighty percent of the animal bone exhibited evidence of burning, suggesting that these remains were broken and boiled to yield either marrow and/or grease. It is also possible that poor preservation and acidic soils influenced the size of faunal remains recovered from feature contexts (Trader et al. 2010:144-145).

Site Chronology and Regional Comparisons

Site chronology was determined using a series of datasets including diagnostic projectile points, diagnostic ceramics, and a suite of radiocarbon dates. These datasets suggests that 12Da1007 is multicomponent and dates to the Early Archaic, Late Archaic, Early Woodland, Middle

Woodland, Late Woodland, and Late Prehistoric periods (Trader et al. 2010:155). Diagnostic projectile points were recovered from test unit excavations, unprovenienced surface collection, piece-plots, and feature excavations. Ceramics also were recovered from test unit excavations, surface collections, and feature excavations.

Fifteen wood charcoal and charred nutshell samples collected from 14 features were submitted to Beta Analytic, Inc. (Beta) for radiocarbon dating (Table 1). Samples were selected based on the amount of carbonized materials present, association with other botanical materials, and association with diagnostic artifacts. One feature (Feature 13) had more than one sample submitted for ¹⁴C because of multiple fill zones. All radiocarbon dates were corrected by Beta using the INTCAL 04 calibration database (Intcal04 2004). These samples yielded a suite of acceptable ¹⁴C dates ranging between B.C. 160 to A.D. 60 (Beta-273109) and A.D. 1450 to A.D. 1650 (Beta-273112) (Figure 3). Radiocarbon dates from three features (59, 127, and 158) were modern and indicate contamination from bioturbation or historic disturbances (Table 1). Based on acceptable radiocarbon dates, components dating to the Middle Woodland, Late Woodland, and Late Prehistoric periods are recognized. The following sections will discuss each cultural period represented at 12Da1007 separately.

Early Archaic Period (8050 to 6050 B.C.)

The Early Archaic component is represented by one Kirk Corner Notched Cluster point identified as a Charleston Corner Notched type (Figure 4a). This specimen was recovered from surface contexts and falls within the range defined by Stafford and Cantin (2009:293-394) as Kirk Corner Notched Small points. Based on excavations at the Caesar's Archaeological Project, the Kirk occupation dates between 9088 B.C. and 7602 B.C. (Stafford and Cantin 2009:289, Table 10.1; Trader et al. 2010:155). The Early Archaic occupation at site 12Da1007 represents the first known prehistoric use of the site, once the landform on which the site was situated was stabilized. This occupation is rather ephemeral and likely represents a brief hunting foray.

Late Archaic Period (3550 to 1650 B.C.)

The Late Archaic component is represented by several projectile point fragments. A complete Brewerton Side Notched point was piece-plotted in Block 5 (Figure 4b). Traditionally, Brewerton Side Notched Points were dated to the Late Archaic period (Justice 1987:115); however, they may have technological antecedents dating to the Middle Archaic period (Purtill 2009:572; Stafford and Cantin 2009:299).

Other Late Archaic point types from 12Da1007 include a Late Archaic Stemmed Cluster point type, collected from surface contexts in Block 5 (Figure 4c). This specimen could not be typed to a specific point type. The Late Archaic Stemmed Cluster category included Karnak Unstemmed and Stemmed varieties, as well as McWhinney Heavy Stemmed, all of which have been defined as characteristic of the French Lick Phase in southern Indiana (Justice 1987:133-139). Stafford and Cantin (2009:300) note that the French Lick Phase is defined by Matanzas, Big Sandy II, and straight- to expanding-stem point forms, often referred to as "M-B-K-S" points from Patoka Lake. Investigations at Patoka Lake obtained radiocarbon dates between 2850 to 1450 B.C. (Stafford and Cantin 2009:300).

Table 1. ¹⁴C Dates Obtained from Feature Contexts, 12Da1007						
Lab No.	Fea. No.	Zone	Material	¹⁴C Age B.P.	δ¹³C	Calendar Age - 2σ
Beta-273100	1	A	Unidentified wood and bark	1130 ± 40	-27.6	A.D. 780 - 1000
Beta-273101	12	A	Red Oak wood	1150 ± 40	-27.9	A.D. 780-980
Beta-273102	13	A	Ash wood	360 ± 40	-25.3	A.D. 1440-1640
Beta-273103	13	B	American Elm wood	330 ± 40	-23.9	A.D. 1450-1650
Beta-273104	25	A	Honey Locust wood	890 ± 40	-25.3	A.D. 1030-1230
Beta-273105	42	A	Unidentified wood and bark	900 ± 40	-24.2	A.D. 1030-1220
Beta-273106	59	A	White Oak wood	130 ± 40	-25.7	A.D. 1660-1960
Beta-273107	70	--	Honey Locust wood	1090 ± 40	-24.2	A.D. 880-1020
Beta-273108	35	A	Hickory wood	1130 ± 40	-25.4	A.D. 780-1000
Beta-273109	117	A	Unidentified wood	2030 ± 40	-26.1	B.C. 160 to A.D. 60
Beta-273110	127	A	Sycamore wood	70 ± 40	-24.7	A.D. 1680-1740 (A.D. 1810-1930, & A.D. 1950-beyond 1960)
Beta-273111	158	A	White Oak wood	70 ± 40	-25.5	A.D. 1680-1740 (A.D. 1810-1939, & A.D. 1950-beyond 1960)
Beta-273112	163	B	Sycamore wood	350 ± 40	-26.1	A.D. 1450-1650
Beta-273113	128	A	Unidentified wood	1000 ± 40	-25.4	A.D. 980-1060 (A.D. 1080-1150)
Beta-273114	72	B	Ash Wood	1230 ± 40	-24.8	A.D. 680-890

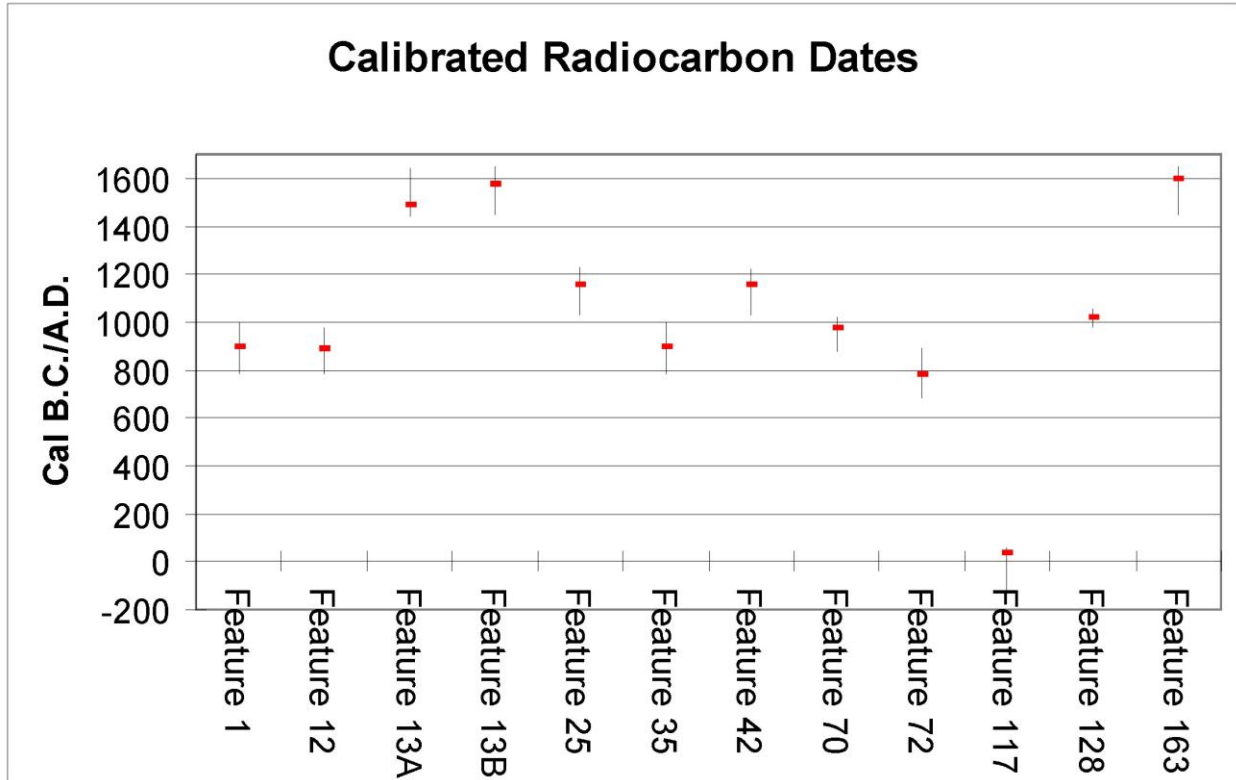


Figure 3. Acceptable ^{14}C dates obtained from features.

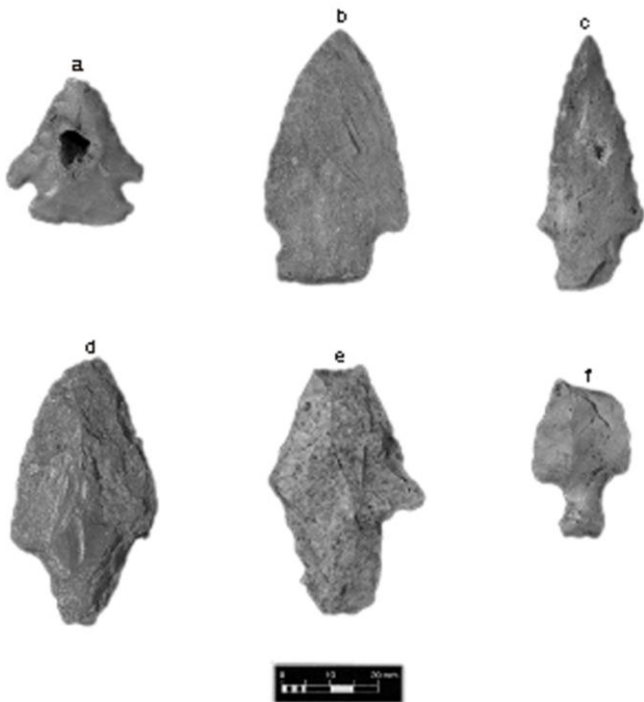


Figure 4. Archaic, Late Archaic, and Early Woodland projectile points: a. Charleston Corner Notched point; b. Brewerton Side Notched point; c. Late Archaic Stemmed Cluster point; d. Gary Contracting Stemmed point; e. Dickson Cluster point; f. Motley Cluster point. Photo by Kim Starbuck, Gray & Pape, Inc.

Based on the presence of the projectile points discussed above, the entirety of the Late Archaic period is well represented at 12Da1007. Point types suggest transitional Middle Archaic/Late Archaic and transitional Late Archaic/Early Woodland components; however, no Terminal Archaic artifacts (i.e. Merom or Trimble points) were collected. None of these artifacts were recovered from feature contexts, nor were any Late Archaic dates obtained from the site. It is unknown whether undated features might represent Late Archaic pits (Trader et al. 2010:156). Therefore, the Late Archaic component most likely consists of a rather brief, transitory occupation, consisting of small hunting or foraging parties.

Early Woodland Period (1000 to 200 B.C.)

The Early Woodland Period is represented by two Dickson Cluster point types (Figure 4d and 4e) and one Motley Cluster Point type (Figure 4f). These point types originate during the Late Archaic period, but are considered diagnostic of the Early Woodland period. One of the Dickson Cluster points has been identified as a Gary Contracting Stemmed point type (Figure 4d), which Justice (1987:189) reports appeared during the latter portion of the Late Archaic period extending into the Middle Woodland period. Motley Cluster points also appear during the Late Archaic period and continue into the Early Woodland period and have been dated between 800 and 600 B.C. (Justice 1987:199). Both Dickson and Motley Cluster point types are considered diagnostic of the Crab Orchard tradition, which begins around 600 B.C. (Ruby 1994:6-7; Trader et al. 2010:158). Similar to the Early and Late Archaic occupations, use of the site 12Da1007 during the Early Woodland period is rather brief and ephemeral, and likely consisted of small hunting or foraging parties.

Middle Woodland Period (200 B.C. to A.D. 590)

The Middle Woodland period at 12Da1007 is well represented by a variety of datasets including diagnostic projectile points, ceramics, exotic raw materials, and radiocarbon dates. The Middle Woodland period is characterized by monumental mound construction, elaborate mortuary practices and the presence of exotic trade goods, which suggest involvement in a large interregional interaction sphere, referred to as Hopewell (Struever 1964; Trader et al. 2010:158).

The earliest Middle Woodland occupation is represented by a radiocarbon date of 160 B.C. to A.D. 60 (Beta-272109), from Feature 117 (Table 1, Figure 3). While this places the site within the earlier portion of the Middle Woodland period, calibrated dates overlap those defined by the Mann Phase (A.D. 100 to 500) in southern Indiana. This date also falls comfortably within the Crab Orchard Phase which occurs between 500 B.C. and A.D. 1 in the Wabash River Valley (Ruby 1994; Trader et al. 2010:159; Winters 1967:55).

The presence of a Havana Ware sherd (Figure 6) from Feature 128 also strengthens the Middle Woodland, particularly Hopewell presence at the site. Winters (1967:44) notes the presence of Havana tradition sites along the Wabash River in southeastern Illinois. While the presence of the Havana Ware sherd in Feature 128 suggests a Middle Woodland affiliation, unidentified wood charcoal yielded a radiocarbon date of A.D. 980 to 1060 (Beta-273113), which suggests a Late Woodland occupation coeval with the Albee phase. Obviously, mixing of archaeological components has occurred within this feature. It is possible that Feature 128

represents a Late Woodland feature that was backfilled with the Havana Ware sherd. Curiously, other artifacts were rare in this pit (Trader et al. 2010:159).

Other evidence for a Havana presence at 12Da1007 includes the occurrences of Knife River Flint (KRF) debitage, a small mica fragment, and Wyandotte chert. Exotic raw materials identified in the 12Da1007 assemblage suggest movement of these materials over long distances. Knife River Flint is obtained from west-central North Dakota, over 1900 kilometer (km) from 12Da1007 (Gregg 1987:369). The prehistoric use of KRF is rather wide-spread geographically, particularly during the Paleoindian and Middle Woodland periods (Gregg 1987:371). KRF at 12Da1007 is represented by three pieces of debitage. KRF is often found in Middle Woodland Hopewell sites and is considered one of the exotic materials traded as part of the Hopewell Interaction Sphere (Seeman 1979:299-300). KRF is relatively rare in Indiana sites, but artifacts manufactured from KRF are reported from the Mann Site (Justice 1996) and Crib Mound Site (DeRegnaucourt and Georgiady 1998:205; Trader et al. 2010:94, 159). It is interesting to note that much of KRF found in Illinois and Indiana are usually found in mortuary contexts and not at habitation sites (Conrad 2004:169).

Mica found in archaeological contexts is known to originate in the Appalachian highlands of North Carolina. Wyandotte chert, which was widely used during the Middle Woodland periods, crops out over 100 km east of 12Da1007. These materials also have been recovered from other Middle Woodland sites in Indiana and Illinois (Seeman 1979; Struever 1964). Cantin (2008:74) notes that because of the superior knapping quality of Wyandotte chert “it is conducive to the production of thin, technically superior, aesthetically pleasing projectile points found . . . in the Paleo-Indian, Early Archaic, and Middle Woodland periods.” The Late Archaic period saw a decrease in the use of Wyandotte chert; however, this trend was reversed during the Early Woodland and Middle Woodland periods. The use of Wyandotte chert declined during the Late Woodland and Late Prehistoric periods (Cantin 2008:74; DeRegnaucourt and Georgiady 1998:110-111).

A more prevalent later Middle Woodland presence is represented by the recovery of both diagnostic projectile points and ceramics. A Lowe Cluster, Lowe Flared Base projectile point (Figure 5a) was recovered from the surface of Block 12. This point type is diagnostic of the terminal Middle Woodland period and first appears around A.D. 200 and extends until A.D. 500 (Justice 1987:213). Winters (1967:54) defined Lowe Flared Base as a distinguishing characteristic of his LaMotte culture. Justice (1987:213) notes that Lowe Flared Base points are diagnostic of the Mann complex in southwestern Indiana and the Allison-LaMotte culture of the lower Wabash Drainage. Winters (1967:54) also identified lamellar flake blades as a common element in [Allison-] LaMotte ceramic assemblages. Both the Lowe Flared Base point and the lamellar flake blade recovered from the site are manufactured from high quality Wyandotte chert, an exotic chert type (Trader et al. 2010:159).

A number of Allison-LaMotte ceramic sherds were recovered from feature and test unit contexts. Allison-LaMotte ceramics from 12DA1007 have sandy pasts and are relatively dense with plain or cordmarked surfaces. Allison-LaMotte is thought to represent “. . . a transitional cultural tradition linking Middle and Late Woodland lifestyles in central Indiana” (Redmond and McCullough 2000:645). The highest frequency of Allison-LaMotte ceramics was recovered from Feature 70. Honey Locust wood recovered from this feature yielded a radiocarbon date of $1090 \pm$ A.D. 880 to 1020 (Beta-273107), suggesting a later Woodland Albee phase occupation. The presence of Allison-LaMotte ceramics in this feature is somewhat puzzling, but it is possible that

earlier cultural materials were mixed with later occupations when the pit was backfilled (Trader et al. 2010:160).

The Middle Woodland period at site 12Da1007 is well represented. An earlier Middle Woodland occupation is defined by the radiocarbon date obtained from Feature 117 (160 B.C. to A.D. 60), while interaction in the interregional Hopewell Interaction Sphere is evidenced by the presence of exotic trade goods, such as Knife River Flint, mica, and Wyandotte chert there was no evidence of mortuary or ceremonial activities. Interestingly, the small fragment of mica was recovered from Feature 117. A later Middle Woodland occupation is representative of the Allison-LaMotte phase for central Indiana, based on the presence of a Lowe Flared Base point and Allison-LaMotte pottery (Trader et al. 2010:160).

Subsistence identified at Allison-LaMotte phase sites focused on the exploitation of both terrestrial and aquatic resources. Botanical remains indicate use of a wide range of wild seeds and nuts, dominated by hickory remains. Domesticates identified in Allison-LaMotte assemblages included squash rind, stems, and seeds, as well as maygrass, *Chenopodium*, and erect knotweed (Redmond and McCullough 2000:650). The Middle Woodland botanical assemblage at 12Da1007 is composed primarily of hickory nutshell, suggesting that inhabitants were mostly concerned with exploiting seasonally available nut mast. With respect to regional settlement patterns, most investigations at Allison-LaMotte phase sites along the Wabash and White rivers have focused on large settlements containing structures and numerous features. However, investigations along the West Fork, White Valley, and small tributaries of the Wabash River have identified small campsites that probably represent seasonal occupations. Redmond and McCullough (2000:649) suggest that “[t]he presence of such small ancillary sites shows that Allison-LaMotte subsistence needs were supplemented by hunting and gathering excursions away from the main village sites most likely on a seasonal basis.” Therefore, it is likely that the Allison-LaMotte occupation at 12Da1007 represents one of these ancillary sites, which was occupied seasonally to exploit upland resources (Trader et al. 2010:284).

Late Woodland Period (A.D. 500 to A.D. 1300)

The Late Woodland period at site 12Da1007 is represented by a suite of radiocarbon dates, as well as diagnostic ceramics and projectile points. An early Late Woodland component is represented by a Jack’s Reef Cluster projectile point, tentatively identified from Feature 25 (Figure 5b). Jack’s Reef Cluster points were originally defined by Winters (1967:68) as diagnostic of his Late Woodland Albee Complex; however, recent studies suggest that Jack’s Reef Cluster points are no longer considered diagnostic of Albee phase sites (McCord and Cochran 2003; Redmond and McCullough 2000:656). Throughout the Eastern Woodlands, Jack’s Reef Cluster Points are considered the first true arrowhead and initially appear around A.D. 500 (Justice 1987:217). As noted, this point was recovered from Feature 25, in which Honey Locust wood yielded a radiocarbon date of A.D. 1030 to 1230 (Beta 273104), which suggests a later Late Woodland occupation coeval with the Albee phase. Again, the presence of an earlier point type in this feature may be indicative of mixing of archaeological components. The only radiocarbon date that corresponds with the Jack’s Reef Cluster point type was obtained from Feature 72. Ash wood yielded a radiocarbon date of A.D. 680 to 890 (Beta-273114), which falls between Allison-LaMotte and Albee (Trader et al. 2010:160).

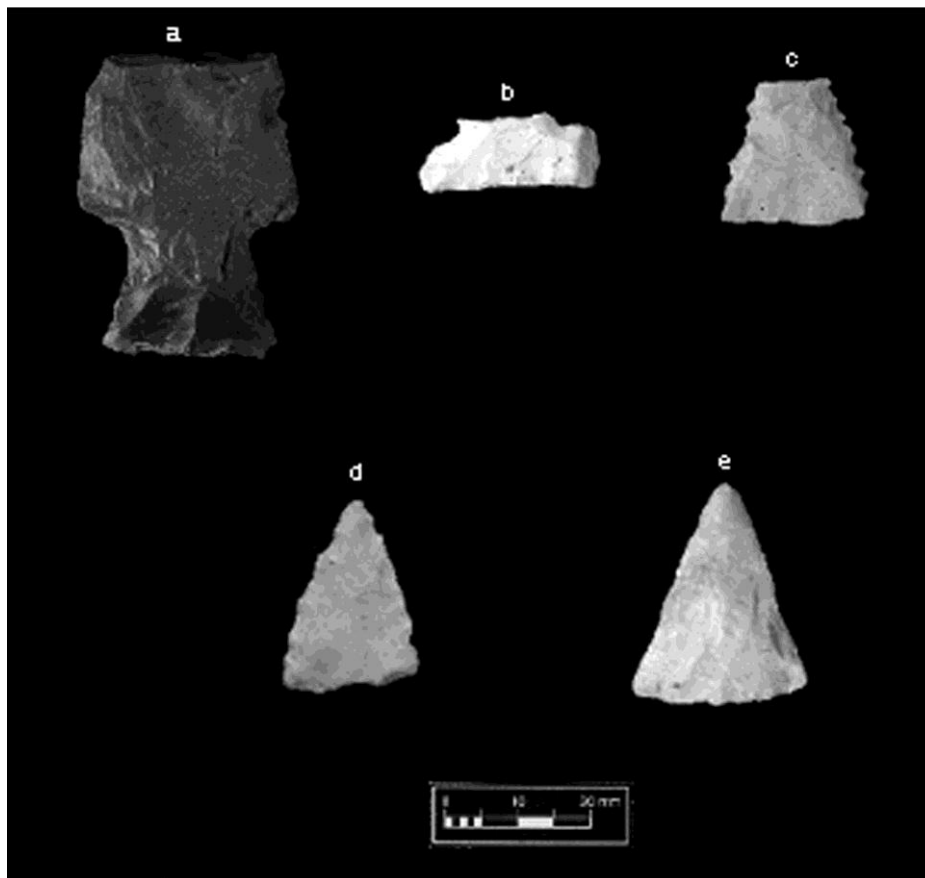


Figure 5. Middle Woodland, Late Woodland and Late Prehistoric projectile points: a. Lowe Flared Base; b. Jack's Reef Cluster point; c. Serrated Triangular point; d. Possible Cahokia Cluster point; e. Triangular point type. Photo by Kim Starbuck, Gray & Pape, Inc.



Figure 6. Havana Ware sherd. Photo by Kim Starbuck, Gray & Pape, Inc.

As noted, a suite of Late Woodland ¹⁴C dates were obtained from eight features (1, 12, 25, 35, 42, 70, 72, and 128), some of which have already been reported here (Table 1, Figure 3). The majority of these dates overlap or is considered co-terminus with the Albee phase (1, 12, 35, 35, 42, and 128). The Albee phase was originally defined by Winters (1967:60) as the Albee Complex. Recent investigations place the Albee phase between A.D. 800 to 1300 (McCord and Cochran 2003; Redmond and McCullough 2000:661).

Diagnostic Albee phase artifacts include small isosceles triangular projectile points and grit-tempered cordmarked jars (McCord and Cochran 2003:36-37; Redmond and McCullough 2000; Winters 1967). Three triangular points were recovered from test units, unprovenienced surface collection, and piece-plot contexts (Figure 5c, 5d, and 5e). All of these points were identified as Late Woodland/Mississippian Triangular Cluster points and were specifically identified as Madison points. These point types have a wide geographic range throughout the eastern United States and date from A.D. 800 to the beginning of the Historic period (Justice 1987:224-227). Therefore, their use overlaps with other later prehistoric groups in the region. One of the triangular points exhibits a small notch at the base and may represent a Cahokia Cluster point (Figure 5d) (Justice 1987:232-233), rather than a Madison point. These point types occur in the Fairmount phase at Cahokia and date between A.D. 900 and A.D. 1050, placing it well within the Albee phase (Trader et al. 2010:161). One of the triangular points (Figure 5c) has serrated blades. In Railey's triangular point typology, serrated triangular points are defined as Type 3 Fine Triangular: Coarsely Serrated and are reported from the Fox Farm site in Kentucky (Railey 1992). According to Railey (1992:158-167), these point types have been found in Middle Fort Ancient period contexts and date between A.D. 1200 to 1400, placing them within the latter portion of the Albee phase and beginning of the Oliver phase.

According to McCord and Cochran (2003:36), "Albee Cordmarked ceramics are the most distinctive artifacts of the Albee Phase." Pottery analyzed from the Morrell-Sheets site, an Albee phase site, were grit-tempered with very sandy pastes (McCord and Cochran 2003; Redmond and McCullough 2000:655). Similar ceramics were recovered from Feature 1, which were coarsely tempered and friable; however no Albee phase pottery was recovered (Trader et al. 2010:161). Based on the suite of radiocarbon dates, pottery, and projectile points, The Late Woodland component at 12Da1007 is undefined but should be considered coeval with the Albee phase; however, no Albee phase ceramics were recovered. Radiocarbon dates obtained from feature contexts overlap and/or are coterminus with the Albee phase; although dates from Features 25 and 42 may overlap with later Oliver phase groups and the date from Feature 72 is representative of an earlier Late Woodland component (Trader et al. 2010:161). Most data concerning Albee phase sites is based on excavations of mortuary sites (McCord and Cochran 2003; Redmond and McCullough 2000).

The most extensive excavations at a non-mortuary Albee site have been conducted at the Morell-Sheets site (McCord and Cochran 2003). Overall, our knowledge of Albee settlement is incomplete. Typically, cemeteries and habitation sites are situated in the valleys of major drainages or near "extensive tracts of marsh or wetlands" (McCord and Cochran 2003:41). Sites are permanent or semi-permanent, with storage facilities, residential structures, and associated mortuary facilities (McCord and Cochran 2003:41). Redmond and McCullough (2000:657) note that Albee phase sites in the upper West Fork Valley are composed of ephemeral occupations represented by collections of diagnostic ceramics. The location of Albee sites near marshes is a matter of subsistence preferences. Analysis of the botanical and faunal assemblage at Morell-Sheets provided some of the first data on Albee subsistence. Botanical analysis indicates that

barley and corn were the main cultigens with minimal amounts of maygrass, knotweed, and squash evident. Exploitation of wild nut resources was rare and focused primarily on hazelnuts. White-tailed deer dominated the faunal assemblage at Morell-Sheets; however, fish and waterfowl were absent (McCord and Cochran 2003:40). Overall, subsistence at Morell-Sheets focused on upland resources (Redmond and McCullough 2000:659). Site 12Da1007 is unlike most Albee phase sites in that no architectural features or a mortuary component was identified. However, the placement of 12Da1007 near a marshy area is typical of Albee phase sites. Subsistence remains, primarily botanical, are also unlike those recovered from the Morell-Sheets site. No corn, or other domesticates were identified in the Late Woodland botanical assemblage at site 12Da1007. Similarly, nutshell was rare at Morell-Sheets, whereas, nutshell, particularly hickory nutshell, is well-represented in the 12Da1007 assemblage. Only Feature 1 had significant amounts of Hazelnut (Trader et al. 2010:284-285). While 12Da1007 is likely co-eval with Albee phase sites, it is unlikely that it represents an Albee phase occupation. Rather, it represents a Late Woodland group living on the fringe, unaffiliated with any known group.

Late Prehistoric Period (Post A.D. 1300)

The Late Prehistoric period at 12Da1007 is represented by three-radiocarbon dates and small triangular arrowpoints (Table 1, Figure 3). As discussed above, small triangular arrowpoints are diagnostic of the Late Woodland/Late Prehistoric periods and date between A.D. 800 and the beginning of the Historic period. The Late Prehistoric period in the Ohio Valley is typically defined as either Mississippian below the Falls of the Ohio, or as Fort Ancient above the Falls. In central Indiana, two Late Prehistoric archaeological phases have been defined, the Oliver phase and the Vincennes phase. The Oliver phase was originally defined to describe a ceramic complex found in the West Fork White River Valley based on excavations at the Bowen Site (Redmond and McCullough 2000:662-663). According to Redmond and McCullough (2000:672), the Oliver phase covers a 400-year period beginning around cal A.D. 1100 and extending to cal A.D. 1500. Vincennes Culture sites, as defined by Winters (1967:71-73) are centered along the Wabash Valley near Vincennes, Indiana and appear to be an admixture of ceramic traditions known from the Cahokia and Kincaid areas. They probably represent a “. . . very late Mississippian manifestation” (Winters 1967:83).

Three radiocarbon dates were obtained from two features (Feature 13 and 163) (Table 1, Figure 3). Dates from Feature 13 were obtained from two separate stratigraphic zones. Ash wood yielded a radiocarbon date of A.D. 1440 to 1640 (Beta-273102) from Zone A, and American Elm Wood yielded a radiocarbon data of A.D. 1450 to 1650 (Beta 273103) from Zone B. Sycamore wood collected from Zone B of Feature 163 provided a radiocarbon date of A.D. 1450 to 1650 (Beta-273112). Both Features 13 and 163 are strikingly similar in terms of plan view, profile, and probable function, and are considered to be contemporary. Both features have multiple fill zones, the bottommost of which consists of a dark, charcoal-filled deposit, while a reddish, highly oxidized rind surrounds the features. Few diagnostic artifacts were recovered from these features and consist of sand-tempered, cordmarked ceramics. These ceramics are atypical of Late Prehistoric components and might represent earlier ceramic traditions mixed in the upper fill zones when the pits were backfilled (Trader et al. 2010:161-162).

The radiocarbon dates from Feature 13 and 163 falls at the end period of the Oliver phase and are considered here to post-date the Oliver phase. It is possible that these dates are

representative of a Vincennes Culture occupation. It is equally probable that these dates represent an Oneota occupation; however, 12Da1007 falls at the eastern limits of the Oneota.

The Oneota Period of Tradition “. . . is an Upper Mississippian cultural manifestation. . . [and] encompasses shared characteristics of the Fort Ancient Tradition, centered in Indiana and Ohio . . . and the western Oneota Tradition found in parts of Michigan, Indiana, Illinois Wisconsin, Iowa, South Dakota, Kansas, Nebraska, and Missouri. Both Oneota and Fort Ancient traditions may span as much as several centuries. . .” [Henning 1998:352].

According to Henning (1998:353), the Oneota tradition can trace its beginning to A.D. 900 and extends over a 700-year period coalescing into several known historic tribes. Hall (1991:19) notes that the Oneota tradition began around A.D. 1100, while the Oneota Vulcan phase identified in the Illinois American Bottom dates between A.D. 1400 and A.D. 1600 (Milner et al. 1984:182). The Oneota tradition can be viewed as a bridging culture joining the Great Plains with the Eastern Woodland groups by way of the Prairie Peninsula (Henning 1998:345). Therefore, it is possible that Features 13 and 163 is representative of a brief Oneota presence in the region (Trader et al. 2010:162).

At best, the Late Prehistoric occupation at 12Da1007 is undefined and cannot be affiliated with any known Late Prehistoric groups without diagnostic ceramics. It is coeval with many Late Prehistoric phases. The 12Da1007 dates fall at the terminus of the Angel phase (A.D. 1100-1400) and the beginning of the Caborn-Welborn phase (A.D. 1400-1700) (Pollack 2004; Pollack and Munson 2003:256-259). While dates from Site 12Da1007 overlap those defined for Angel and Caborn-Welborn, the site falls outside the known distribution for these groups. Likewise, the site falls outside known limits for Oneota. It is possible the site may present a Vincennes phase site, and possibly falls within the spatial limits as revised by Wells (2008:19, Figure 1.1). The 12Da1007 dates are similar to those reported for Reed Walker and Heaton Farm sites (Wells 2008:104). Dates from 12Da1007 also overlap those known from late Oliver sites as reported by Redmond and McCullough (2000:672-673). However, it is likely that site 12Da1007 falls in an area outside these boundaries and is not affiliated with any known geopolitical group (Trader et al. 2010:162). At the very least, it represents a single episode in which a small group of people traveled to the area, spent a day or two and left.

Discussion

The chronology of site 12Da1007 was determined through a series of datasets based on the presence of diagnostic projectile points, ceramics, and a suite of radiocarbon dates. These datasets all provide further evidence concerning the multicomponent nature of the site, dating from the Early Archaic through Late Prehistoric periods. The Late Woodland period is probably the best represented component at the site, ranging between cal A.D. 680 and A.D. 1230. Whereas the more recent date overlaps with Mississippian manifestations, the Late Woodland component fits squarely within the dates defined for the Albee phase; however, no Albee phase ceramics were recovered.

While these materials provide further evidence of the multicomponent nature of 12Da1007, they also provide evidence of a rather archaeologically disturbed site. Mixed cultural materials in pit features are testament to extreme bioturbation activities, consisting of roots and rodent burrows. In all probability, Late Woodland inhabitants at the site might have been responsible for the presence of earlier cultural materials in backfilled features. Additionally, much later Historic period occupation of the site would have impacted the previous prehistoric occupations through building construction/demolition, utility construction, fence-building activities, and finally farming activities (i.e. plowing). Examination of Table 1 illustrates the impact of bioturbation in three features (39, 127, and 158) in which modern ¹⁴C dates were obtained.

Interpretations and Conclusions

Site 12Da1007 is distributed into two distinct loci (Figure 2), an Eastern Locus and Western Locus, which are disrupted by a zone of historic disturbances. The majority of artifacts and features were identified within the boundaries of the Eastern Locus, which constituted the main occupation of the site along the highpoint of the ridgecrest. Pit features represent a range of functions as well as cultural affiliation. Seven thermal features were identified at the site (Features 12, 31, 54, 70, 72, 117, and 163) (Figure 2). It is likely that most of these features based on the amount of FCR and burned earth identified are thermal features, possibly hearths; however, two of those features (70 and 117) might represent smudge pits based on the amount of bark recovered. These pits may have been used to smoke hides, or as repellants against insects. Eight features (24, 26, 42, 73, 77, 95, 127, and 128) are considered refuse pits that were originally used as storage pits. Five features (1, 12, 35, 158, and 202) were possibly used in processing plant and animal remains based on the presence of nutshell and small fragments of unidentified animal bone. The function of the final feature (59) is unknown. Based on the distribution of post molds across the site, none of them appear to represent the remnants of any architectural features, such as structures. That is, none appear to represent any recognizable pattern. It is possible that post molds may represent small temporary windbreaks or areas where drying racks were situated.

The temporal and/or cultural affiliation is known for 17 features based on the presence of diagnostic artifacts and radiocarbon dates and represents the Middle Woodland, Late Woodland, and Late Prehistoric periods. Four features (31, 77, 117, and 202) are considered Middle Woodland and are likely associated with an Allison-LaMotte phase occupation. Eight features (1, 12, 25, 35, 42, 70, 72, and 128) are considered to be Late Woodland and most of the dates overlap or are considered co-terminus with the Albee phase; however, no Albee phase pottery was recovered. Two features (13 and 163) are considered to be Late Prehistoric based on three radiocarbon dates ranging between cal A.D. 1440 and 1560, and are considered to fall within the Vincennes Culture in southwestern Indiana; however, at best, the Late Prehistoric period component at the site is undefined.

Site 12Da1007 consists of a multicomponent archaeological site representative of a series of short-term hunting camps and longer-term encampments. The subsistence system identified at 12Da1007 from the Middle Woodland through the Late Prehistoric periods is geared toward the seasonal exploitation of nut mast. There is no evidence that site occupants practiced horticulture

or cultivated gardens. The presence of plant seeds representative of the Eastern Agricultural Complex were probably collected during daily gathering forays or were brought along with the site inhabitants (Trader et al. 2010:284).

Throughout its 9000 year use, prehistoric occupants specifically traveled to this area to exploit upland resources through hunting and gathering. Botanical evidence suggests that ancient people timed their visits during the late summer and fall. There is little evidence of earlier occupations (Early Archaic, Late Archaic, Early Woodland), with the exception of an occasional diagnostic projectile point. The later Middle Woodland, Late Woodland, and Late Prehistoric occupations reflect more intensive use, evidenced by the construction of features, the recovery of ceramics, and the presence of processed botanical remains; however, much of this information failed to place these occupations into any well-defined cultural phases. The majority of site activity is compressed within the disturbed plowzone and indicates a palimpsest of several different habitations that cannot be separated temporally or spatially. Despite limited integrity, site 12Da1007 provides new information for south central Indiana and upland utilization over a 9000 year period.

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REPORTS / FEATURES

To disseminate further archaeological information of local, topical, and community interest, this section of the journal includes occasional “reports” or “features” on various archaeological topics pertinent to specific regions, counties, or city/towns of Indiana.

THE ARCHAEOLOGICAL CONSERVANCY IN INDIANA

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The Archaeological Conservancy is a national, nonprofit organization whose purpose is the permanent protection of the most significant archaeological sites in the nation. Since our founding in 1980, we have permanently preserved over 405 archaeological sites in over 40 states, including four in Indiana. Generally we do this by acquiring title to the land containing the site and creating a perpetual archaeological preserve. We acquire sites by donation, by bargain-sale-to-charity, and by purchase at fair market price. We do this in order to insure that archaeological sites will be available to future generations for research, education, and as landmarks of our national heritage.

Archaeological sites on private land are particularly at risk for destruction by residential and commercial development, mechanized agriculture, and from looting. Indiana is unusually progressive in having a law, The Indiana Historic Preservation Act, which provides a level of protection to archaeological resources on private land, but loss of archaeological resources remains a constant threat. The Archaeological Conservancy takes a complementary approach to archaeological site preservation. Rather than attempting to regulate the actions of property owners, The Archaeological Conservancy seeks to become the owner of significant archaeological sites. As Mark Michel, the CEO of The Archaeological Conservancy likes to say “We do it the American way, we buy them.”

Purchasing land is, of course, an expensive proposition. As a private nonprofit, The Archaeological Conservancy receives no governmental money and relies entirely on private support. Our principal source of funds comes from our membership. The Archaeological Conservancy has about 20,000 members nationwide, whose annual dues support the operations of the organization. The Archaeological Conservancy (TAC) also solicits grants from corporations and charitable foundations, especially to fund individual acquisition projects. To keep our membership abreast of our activities, and to generally raise awareness of the nation’s rich archaeological heritage, TAC publishes *American Archaeology*, the only magazine devoted to North American archaeology written for the general public.

The Archaeological Conservancy has created four archaeological preserves in Indiana. The first, the Luthra Archaeological Preserve (12Jo5), was donated to the Conservancy by Eclipse Development Corporation. It serves as green space in a residential subdivision in Johnson County and preserves a portion of a late prehistoric Oliver Phase village.

Our second preserve, the Daughtery-Monroe site (12Su13) in Sullivan County, was purchased at fair market price after negotiations with the landowners, who wished to see the

important cultural resources on their property permanently protected. The site dates circa A.D. 200 – A.D. 600 and is a village of approximately 14 acres.

Our third preserve, the Goodall site (12Le9), is the most famous of TAC's Indiana preserves. Known since the 19th century, this complex of 22 conical burial mounds dating from A.D. 1-200, was of seminal importance in early 20th century formulations of the culture history in Indiana and Michigan. Although pre-scientific excavation, looting, and plowing have largely erased all above-ground traces of the mounds from the landscape, modern geophysical surveys using magnetometer and soil-resistivity techniques continue to produce new information about the site. The site was purchased at fair market value from an owner who otherwise planned to subdivide the property as a residential development.

Our most recent acquisition -- undertaken in summer 2012 -- is a Hopewell Culture "Hill Fort" in Dearborn County, thought to be only such archaeological site remaining in Indiana. Known as the Oberting-Glenn Earthwork (12D25) (Figure 1), the hilltop enclosure is formed by an earth and stone wall enclosing about 20 acres. A conical burial mound, six feet high and sixty feet in diameter, is located within the earthwork. Three smaller burial mounds are present outside the walls, and another four were noted in the early 19th century, but have not been relocated today. To create the preserve, thirty acres encompassing the earthwork were purchased for \$300,000 with an additional 10 acres of wooded slope donated by the Glenn family.



Figure 1. Mound at the Oberting-Glenn site in southern Indiana. (photo courtesy of Paul Gardner).

As Indiana's population grows, its economy expands, and its urbanization increases, its archaeological sites will come under greater than ever threats of destruction. The Archaeological Conservancy is actively seeking additional archaeological sites to acquire as permanent research preserves. Any archaeological site on private land that an archaeologist might want to investigate in the future is a potential candidate for acquisition as a permanent research preserve. Persons with information about archaeological sites on private land or who wish further information about the organization can visit our website www.americanarchaeology.com or write Paul Gardner, Midwest Regional Director, The Archaeological Conservancy, 3620 N. High St, Suite 307, Columbus, OH 43214.

GEORGE ROGERS CLARK ~ ARCHAEOLOGY OF A FRONTIER HERO

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As often happens, when we learn about many important figures in American history it becomes apparent that they were multi-talented individuals, and multi-faceted. General George Rogers Clark, that great figure in the history of our state and nation, was just such a man. Well known are his heroic military skills and accomplishments, and how those dramatic accomplishments helped form our nation at a critical point in its early development. We might also be aware of his surveying, diplomatic, and inventing skills. But, perhaps not everyone knows that this man also had interests in archaeology, paleontology, geology, and natural history (Thomas and Conner 1967).

Archaeology by, and related to, George Rogers Clark in Indiana can be separated into several locations to highlight. The first of these is Fort Sackville, the British outpost described as one “of several forts built by the French, British or Americans from 1732 to 1813 in this important frontier settlement [Vincennes, Indiana]” (National Park Service 2004). Lt. Col. Clark and his brave men in 1779 captured the fort from the British. In recognition of the importance of this military feat, and its significance in our country’s history, the country erected the impressive Beaux Arts monument which stands today in Vincennes (Figure 1).

The monument and grounds are now part of the George Rogers Clark National Historical Park, administered by the National Park Service. Sadly, no professional archaeological investigations appear to have been conducted prior to when the site for the monument was cleared of other existing structures, and the excavation preparations for the monument were conducted in the 1930s. Bearss (1970:Chapter 6 (C) (2)), citing an undated newspaper article from Vincennes, reports that when the sprinkler system for the memorial grounds was being installed, human remains were recovered, and that “soon after being exposed, they began to rapidly deteriorate. Local historians speculated that as the bones were deep in the gravel, where the earth had not been disturbed [by monument construction related activities], they were probably those of a soldier or Indian buried in the 18th century.” Modern archaeological investigations, attempting to locate remains of the fort and information from that time period have, however, been conducted in the area (Tomak 1972). Other discoveries and archaeological investigations (e.g. Bringelson 2010; Frost 1988, 1990; Kaufmann et al. 2012; Lagemann 1975; Ruby 1997) have been made in the vicinity.



Figure 1. Historic postcard showing the memorial in Vincennes (card from author’s collection).

In 1970 and 1971, archaeologists from Indiana University conducted excavations (Figures 2, 3) with the goal of recovering information relevant to the British Fort Sackville. A summary of the results of the excavations follows:

The project was complicated by the facts that locational and descriptive data for Fort Sackville are less than desirable, that the area has been continuously occupied up to the present time, and that within the present park there are buildings, pavements, trees, areas of fill, etc. which pose problems for excavation. Moreover, in addition to Fort Sackville (1777-1782), two other forts are reported to have been built in the same general location. These are the French Post Vincennes (c. 1732-?) and the American Fort Knox No. 3 (1813-1816). . . . Some but not a great amount of artifacts and features which are or may be eighteenth century were found. . . . Of particular concern are the remains of two fort walls. . . . Just how they are related to other features is not clear. Fort Knox No. 3 is seemingly represented at least by Wall A. Perhaps some remnant of Fort Sackville has been found. Post Vincennes apparently remains undiscovered [Tomak 1972:62-63].

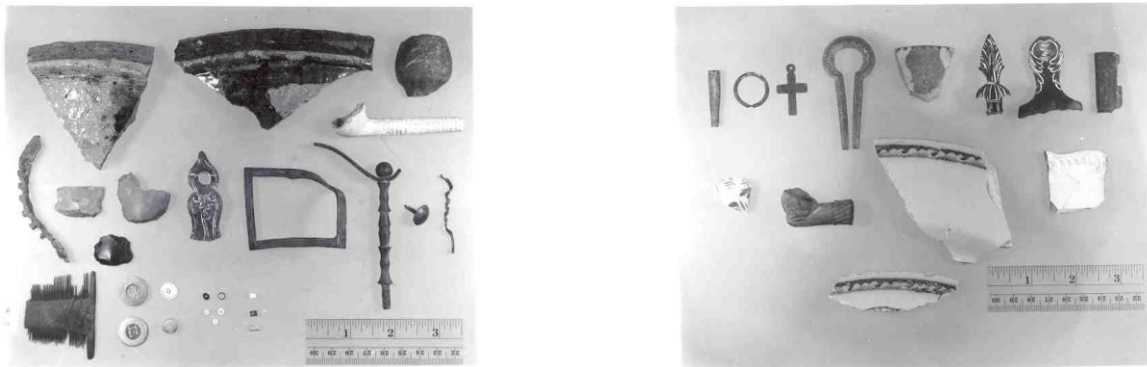
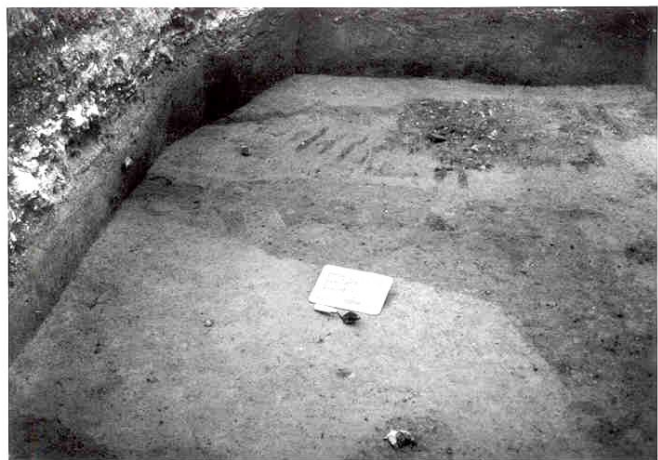


Figure 2. Left: Historic artifacts recovered from one of the excavated trenches (Tomak 1972:Fig. 15). Right: Artifacts such as a brass tinkler, brass crucifix, pipe fragment, and ceramic fragments (Tomak 1972:Fig. 14).

Figure 3. Archaeological excavation unit showing the jog in Wall A which was uncovered (Tomak 1972:Fig. 12).



It is possible that additional archaeological excavations in Vincennes could provide further understanding of the military and civilian occupations that took place there. Tomak (1972:50) suggested specific locations to have additional, as well as new, archaeological investigations. As a result of an overview of the archaeological work which had taken place to date in the vicinity of the park, the National Park Service's Midwest Archeological Center (Nickel 2002:i) recommended a geographic information system (GIS)-based cultural resource base map be produced, geophysical surveys of the area be conducted, and oral histories regarding the park's development be recorded. Nickel stated that future ground disturbance down to the historic grade may encounter archaeological deposits (2002:11). In a recent report (Bringelson 2010:1) regarding archaeological monitoring for proposed utility upgrades at the park, it is stated that "The archaeological resources associated with the Fort Sackville period... are considered to be highly significant and directly related to the park's legislative purpose."

Records indicate that prior to embarking on the campaign to take Vincennes, Clark and his troops arrived at Corn Island at the Falls of the Ohio area. Troops and settlers occupied the island, a blockhouse and cabins were built, and land was planted in corn (Figure 4; English 1897: 131, 471; Indiana Historical Bureau 1997:9). Remnants of these types of features would be valuable archaeological evidence regarding this launching point location for the Vincennes campaign. Unfortunately, the geography of the island (in a river setting), and its subsequent damage in later periods, prevent any current archaeology from being conducted at this important location.



Figure 4. Rendering of Corn Island (Indiana Department of Public Instruction and Indiana State Museum 1976:45).

Coming back to the Falls of the Ohio area in 1803, Clark settled on land (Clark's Point) in what is now part of the Falls of the Ohio State Park in Clarksville, Indiana. He had a log cabin and mill (Barnhart and Riker 1971:254) there on the property, but sadly the original cabin does not still stand. Today there is a reconstruction of what is thought to be the style of his cabin in the general area (Figure 5). Archaeological excavations have been conducted in the general area by several individuals (Anslinger 2001:1-2; Janzen 1972), and more recent archaeological (White 2003) investigations have resulted in additional data to help interpret the history and prehistory of the area.



Figure 5. Professional excavation for construction adjacent to the re-constructed Clark's cabin. Work conducted by, and photograph courtesy of, Indiana University-Purdue University Fort Wayne, Archaeological Survey.

In those latter years of his life, Clark “indulged his life-long interest in natural history. As a pioneer archaeologist of the area [Clarksville], he collected the remains of extinct animals, and other fossils, sending many specimens to Thomas Jefferson for his personal collection” (The Indiana State Museum Society 1976:52). He held in common his interest in these archaeological and paleontological pursuits with Thomas Jefferson, President of the United States from 1801-1809. With his explorations of an Indian burial mound on his Virginia estate in the 1780s, Jefferson conducted the first attempt at a scientific excavation, with understandings of stratigraphy, and its importance, and the development of excavation techniques (Ceram 1971:3, 6-8). Clark’s interests in paleontology, archaeology, and Native Americans continued while in this area, although sadly, “there are no published reports of Clark’s archaeological activities” (Janzen 1972:306).

The General was even interested in what today can still sometimes be a controversial topic: the “mound builders” and their origins (Janzen 1972:307). For many years, various historians, scientists, and archaeologists wrestled with the question of whether early earthworks and sites were made by ancestors of living Native Americans, or constructed by others. As a result of his own studies and investigations of sites, Clark refuted others’ theories about these mounds and earthworks, including one person’s belief that they had been constructed by Hernando DeSoto and his men, and came to the conclusion that they were in fact built by ancestors of existing tribes (Thomas and Conner 1967:208).

Clark’s life ended in 1818 at his sister’s home (Locust Grove) near Louisville, Kentucky, and he was originally buried in the small graveyard there. Over the years, various individuals hoped that the hero could have a more fitting burial location and memorial (Thomas 1967). In 1869, Clark family members had the remains of the General exhumed and reinterred in the Cave Hill Cemetery in Louisville (Thomas 1967:37; Thruston 1936:213), where he still rests today.

In the description of the exhumation, we can gain some archaeological insight into how the body was positively identified as General George Rogers Clark. Citing English (1896), Thomas states the following: “He [English] wrote that Col. R.T. Durrett was present at the reinterment and communicated to him that 9 graves were opened, with the identification being made from remaining gray-red hair, military buttons, and absence of left leg” (1967:37). Details and clues such as these are just the types of information that are critical for identifications in archaeological recovery of burials. It is difficult to know how much actual care was taken in 1869 at recovering all of the materials and specific artifacts, such as the military buttons. Had an archaeological investigation been conducted today in this type of situation, meticulous care would have been taken to recover every burial artifact and all of the remains, and detailed notes, maps, and other documentation would have been recorded. Military burials, in particular, can provide invaluable clues into aspects of life at that time in regards to uniform materials, styles, associated military artifacts, etc.

In October 2003, the Kentucky Archaeological Society, with help from the Falls of the Ohio Archaeological Society, conducted archaeological investigations at Mulberry Hill, the site of the Louisville home of Clark’s parents, and his home for some time. The dig, which involved children, professional and avocational archaeologists, was focused on determining whether intact remnants of the home exist (Falls of the Ohio Archaeological Society 2003; Rodriguez 2003).

Although one hundred ninety-five years have passed since George Rogers Clark’s death, there is still valuable information that can be learned, specifically through archaeology, about this hero’s time and activities.

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GLOSSARY OF ARCHAEOLOGICAL TERMS

A-horizon soil

The upper layer of soil, nearest the surface.

Anthropology

The study of humankind, with particular emphasis on its cultural and biological adaptations.

Archaeology

The anthropological study of past lifeways, cultures, and cultural processes through the investigation of material remains left behind by humans.

Artifact

Any portable object made, used, and/or modified by humans. Or, more generally, any evidence of human behavior. Common prehistoric artifacts found archaeologically include spear points, arrowheads, knives, chipped or broken stone debris, ground stone axes, grinding stones, mortars and pestles, awls, adzes, gouges, pottery, clothing and ornamental pins, decorative items and ornaments, scraping tools, hammerstones, bone fishhooks, stone perforators, and beads.

Associations

The relationships of artifacts and features at a site, based on provenience and context.

Atlatl

A spearthrower.

Avocational archaeologist

A person who participates in archaeology but does not practice it as a profession. Avocational archaeologists may volunteer to work with qualified professional archaeologists, and many take courses and gain substantial experience in archaeological methods and techniques. Others may be involved in archaeology as a hobby. Generally, avocational archaeologists subscribe to a preservation ethic to protect archaeological resources and to responsibly and legally preserve and study information from sites.

B.P.

Before present. By professional agreement present was established to be A.D. 1950 based on radiocarbon dating. For example, 1000 B.P. means 1000 years before A.D. 1950, or A.D. 950.

Celt

An ungrooved axe. Celts may be made of pecked and ground stone, or hammered copper. It is thought that celts appeared in Late Archaic times, and they continue to occur through later prehistory.

Ceramics

Pottery vessels or potsherds.

Chert

Stone of microscopic or small quartz particles used for the making of stone tools. Some types of chert include flint, agate, and jasper.

Chieftdom

A non-egalitarian hierarchial social organization with a fixed and permanent role for a chief/leader.

Collared

A thickened area present below the rim and above the neck on a clay pottery vessel.

Complicated stamped

Decorations of curvilinear or rectilinear design paddle stamped into a clay vessel.

Context

The position of an artifact or feature in its soil matrix, horizontal, and vertical location, and its relationship with other artifacts and features, related to the behavioral activities which placed it there.

Cord-impressed

Impression into a clay vessel surface before firing by a stick wrapped with cord, or cord on the edge of a paddle.

Cordmarked

Cordage impressions on a pottery vessel as a result of stamping with a cord-wrapped paddle.

Core

A stone which exhibits one or more flake scars, showing that it has been used as a raw material for flintknapping.

CRM

Cultural resource management. The protection, preservation, and recovery of information from archaeological sites, under federal and state laws. Universities and private archaeological companies often are hired to conduct CRM archaeology mandated under federal or state statutes.

Culture

A system of shared, learned, symbolic human behavior for adaptation to our natural and social environment. Culture may be thought of as a system composed of interrelated parts or subsystems, where a change in one part affects or influences the other parts. Subsystems interrelated with culture include technology, communication (and language), biological and physical characteristics, psychology, economics, social and political organization, beliefs and values, subsistence, settlement, environment, etc.

Excavation

The systematic recovery of archaeological deposits through the removal and screening of soil. These can be either test excavations (termed Phase II in CRM investigations) or large-scale excavations (termed Phase III in CRM investigations).

Fabric-impressed

Impressions of woven fabric in the surface of a pottery vessel.

Feature

Non-portable evidence of past human behavior, activity, and technology found on or in the ground. Prehistoric features commonly include fire pits and hearths, burned earth and clay, trash and garbage pits, post molds, evidence of house floors or basins, storage pits, clusters of artifacts (e.g., chipped and broken stones, caches of projectile points, ceramics or pottery sherds), human and animal burials, clusters of animal bone, earthworks (such as mounds and circular enclosures), petroglyphs and pictographs, and middens.

Flake

A by-product of flintknapping, toolmaking, use, or other human activities, resulting in a fragment of stone detached from a parent stone. Often, a flake has evidence of purposeful removal, including a bulb of percussion, ripple marks, a striking platform, etc.

Gorget

Decorative object worn on the chest.

Grog-tempered

Ceramics tempered with fragments of crushed pottery.

Lithics

Stones used or modified for human activities such as the manufacture of prehistoric tools, cooking, hunting, etc.

Microtools

Small tools, predominately of stone, manufactured and used to perform certain tasks.

Midden

Cultural refuse or deposits built up at a site.

Multicomponent

An archaeological site with occupations from more than one culture or time period.

Petroglyphs

Naturalistic or symbolic representations or depictions carved into stone.

Pictographs

Pictures or drawings painted on rocks, cave walls, stone outcrops, or rockshelters.

Prehistory

Human activities, events, and occupations before written records. In North America, this primarily includes Native American prehistoric cultures, but does not imply that these cultures did not have long, rich, and varied cultural and oral histories and traditions.

Protohistory

Protohistoric cultures can be defined as those prehistoric groups developing or continuing directly into early recorded history, some associated with early historic artifacts.

Provenience

The horizontal and vertical location of an artifact at a site.

Red Ochre

Late Archaic-Early Woodland culture with burial practices, usually in mounds, involving the use or placement of red ochre (a red hematite pigment).

Shell-tempered

Ceramics (pottery) tempered with fragments of crushed shell.

Site

The presence or occurrence of one or more artifacts or features indicates an archaeological site. An archaeological site is an instance of past human behavior or activity, where humans conducted some activity and left evidence of it behind, on or in the ground. Some common prehistoric site types include artifact caches, villages and camps, cemeteries, burials, workshops (e.g., stone debris from flintknapping activities), quarries, and earthworks (mounds, embankments, enclosures, fortifications, etc.).

Stratigraphy

Horizons, strata, or layers of soil deposited at a location, where the deepest strata were deposited the earliest, and the more recent layers deposited higher in the stratigraphic sequence.

Survey

The systematic discovery, recovery, and recording of archaeological information such as site locations, artifacts, and features by visually inspecting the surface of the ground if the soil is visible. Or, the use of shovel probes, cores, and/or augers near the surface, if surface visibility is restricted or poor. Termed Phase I in CRM investigations.

Test excavation

Systematic excavation of a representative portion or percentage of a site to evaluate and determine its nature and extent, what information is present, whether there are intact or in situ deposits present, and the degree of disturbance to the site, often to determine whether it is eligible for the National Register of Historic Places. Termed Phase II in CRM.

Wyandotte

A type of dark blue-gray chert found in southern Indiana.

For those with access to the Internet, the following sites also provide opportunities to access definitions and additional information regarding archaeological terms and concepts:

<http://www.archaeological.org/education/glossary>

<http://archaeology.about.com/od/rterms/g/radiocarbon.htm>

PREHISTORIC INDIANS OF INDIANA

Note- The word prehistory is a technical term used by archaeologists to indicate information about cultures before written records were kept—in North America at first by Europeans and people of Old World descent—in that area. It does not imply by any means the cultures described did not have long, rich, and varied cultural and oral histories and traditions. All of the cultures certainly did.

Paleoindians:

Paleoindians are the first known people who lived in the Americas, including Indiana. They lived here during the last stages of the last glacial advance, or ice age, and the early part of a changing environment and climate as the glaciers retreated. These people occupied the area now known as Indiana some 12,000 years ago, and lasted until about 10,000 years ago.

These early peoples probably lived in small groups of related individuals who moved around a lot, hunting large game animals, including some now extinct, such as the Mastodon, a large elephant-like creature. They also relied upon the gathering of wild plants to eat for their survival. Their population was very low.

The Paleoindians had very well-made stone tools, made out of a type of stone archaeologists call chert, which is a fine-grained rock that breaks a little like glass when hit by hard materials like another rock or a piece of deer antler. The tools they made by chipping, flintknapping, and flaking included long spearpoints, cutting and scraping implements, and engraving items. Some of their spear and piercing tools are called Clovis, Gainey, Barnes, Cumberland, Holcombe, Quad, Plainview, Hi-Lo, and Agate Basin points.

Evidence of these peoples is often found in Indiana on land near water sources like major rivers and springs, and where chert is found. Little is known about the Paleoindians since they moved around a lot and did not occupy any one place for a very long time. Therefore, they did not leave behind much evidence of their lives in any one place.

Archaic Indians:

American Indians known as the Archaic peoples lived here for a long time: some 6-7,000 years. Although these people did change over time, increasing in population and using new tool types and food preparation techniques, they did share certain general characteristics. These included new types of spear points and knives, with various types of notches and stems for hafting to wooden handles and shafts. Some of the projectile point types of the Archaic Period are called Kirk, Thebes, MacCorkle, LeCroy, Faulkner, Godar, Karnak, Matanzas, Brewerton, Riverton, and Terminal Archaic Barbed points.

They also used ground stone tools such as stone axes, woodworking tools, and grinding stones. The grinding stones were used to pound, crush, and grind wild nuts, berries, seeds, and other plant foods. They were hunters and gatherers of wild plants and animals, and moved around in their natural environments by season, often scheduling their movements to coincide with the

appearance of foods like nuts, fish, deer, and wild seeds. Over time, they became very selective in what kind of resource they were pursuing.

During the Archaic Period, the spearthrower was used. This consisted of a shaft with a handle, weighted for balance with a ground and smoothed stone, and a hook on the end. A spear was fitted onto the hook, and was thrown with the spearthrower shaft.

Towards the end of the Archaic, more evidence of mortuary activities is found, including human burials with a red pigment coloring remains or grave goods. Burial mounds appear. During the Archaic, the cultures became more different from one another, and more types of artifacts were used. Their settlements became more permanent. One type of settlement was along large rivers, where they discarded large amounts of mussel shells. These sites are called shell middens or "mounds," although they are not really constructed, burial mounds. The general Archaic period ended at about 1,500 B.C., although some Terminal Archaic peoples lived until 700 B.C.

Woodland Peoples:

During the Woodland Period, a number of new cultural characteristics appear. A notable event was the appearance and use of ceramics and pottery vessels. Another significant occurrence was the use and increase of horticulture. A remarkable feature of some Woodland sites is earthen mounds and earthworks, such as embankments. The Woodland peoples persisted for over 1,500 years in Indiana.

During the early portion of the Woodland Period, the pottery was thick and heavy. One early Woodland culture called the Adena people had elaborate mortuary rituals, including log tombs beneath earthen mounds. Projectile points during this time included Adena, Kramer, Dickson, and Gary Contracting Stemmed types.

A little later in time, in the Middle Woodland, there were also elaborate burial rituals, but also long-range trade of exotic goods like mica, marine shells, copper, obsidian, copper axes, drilled wolf and bear teeth, and other goods from region to region throughout the Eastern Woodlands area of North America. Some of these groups were called Hopewell peoples. Their ceramics had all kinds of incised and stamped decorations. During this time, the Woodland Indians were likely organized into groups we might recognize as what we today call tribes. Projectile points from the Middle Woodland include Snyders, Lowe Flared Base, Steuben, Chesser, and Baker's Creek.

The latter part of the Woodland Period is called Late Woodland. In Late Woodland, two important events occur. One is the first appearance of agriculture; that is, intensive cultivation and modification of crops such as corn and squash. Another important occurrence is the appearance of the bow and arrow. Prior to this time, most of the chipped stone tools were either spearheads, knives, engraving tools, or scrapers. In Late Woodland, however, small, triangular points occur which are true arrowheads. One type of these arrowheads is called Madison. Other point types are termed Jack's Reef Pentagonal and Raccoon Notched. Settlement during the Late Woodland time changed from the earlier more permanent and nucleated villages to a pattern of smaller sites dispersed more over the landscape. In some regions of the state, Woodland groups

may have persisted almost until historic times, although in general, the Woodland Period ends at A.D. 1,000.

Mississippian Period:

The Mississippian peoples in Indiana lived in some cases almost until contact with Early European explorers, missionaries, soldiers, and traders. They lived from about A.D. 1,000 until possibly as late as A.D. 1650. A noticeable change during this period is the nucleation of some peoples into large settlements akin to "towns," such as at the Angel Mounds site near Evansville, Indiana. These towns had large public areas such as plazas and platform mounds—like truncated or flat-topped pyramids—where influential or important public individuals lived or conducted rituals. Thus, there was social stratification and ranking of individuals in Mississippian societies. There were probably chiefs and religious leaders. The towns were supported by the harvesting of large agricultural fields growing corn, beans, and squash. People living in sites such as these are termed Middle Mississippian.

Notable artifacts indicating Mississippian settlements include large, chipped stone hoes, and pottery bowls and jars tempered with crushed shell. Straps, loops, and handles for these containers characterize this time period as well. Stone tools include point types known as Madison, Nodena, and Cahokia, and other implements such as mortars, pestles, pendants, beads, anvils, abraders, and other items.

Another less elaborate type of Mississippian society called Upper Mississippian was present in the state, with people living in hamlets and villages. Many of these people lived in northern and southeastern Indiana. They also grew and harvested maize, beans, and squash. One group to the southeast was called Fort Ancient, and lots of shell-tempered vessels with straps are found at these sites. In northern Indiana, incised shell-tempered pottery fragments are found on Upper Mississippian sites that are often located near the beds or former beds of lakes.