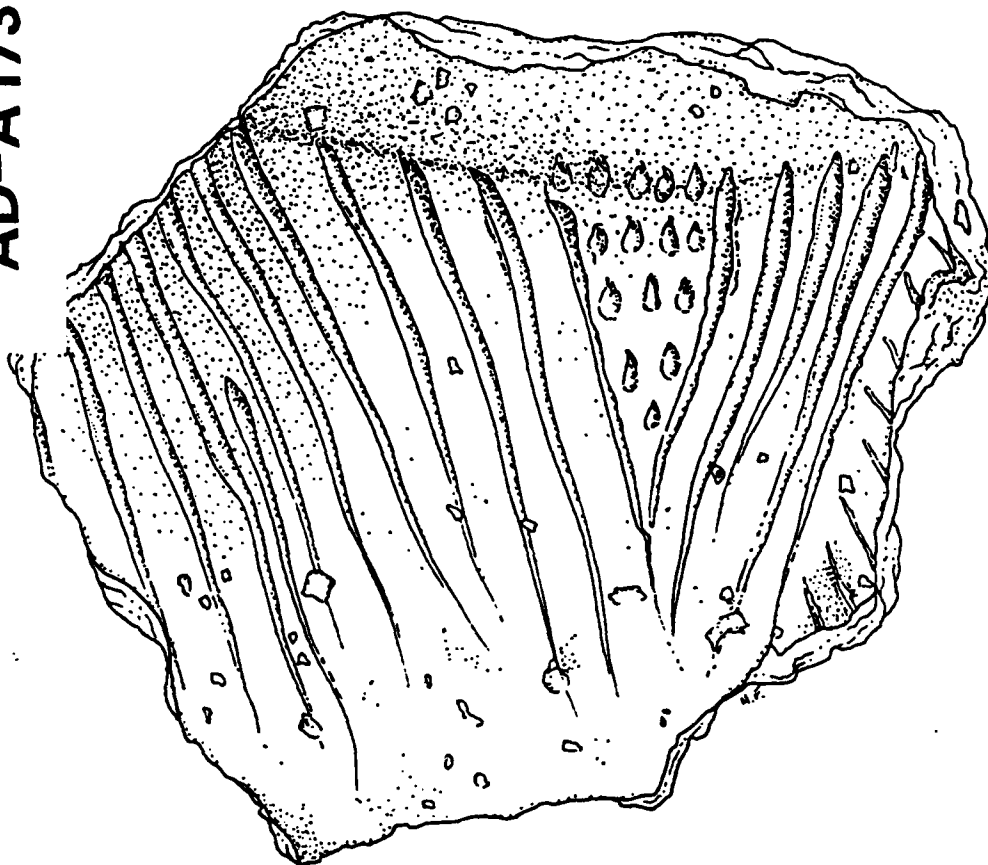


1

ADDITIONAL CULTURAL RESOURCES INVESTIGATIONS
AT SELECTED PORTIONS OF THE STATE-ROAD COULEE - PAMMEL CREEK FLOOD CONTROL
PROJECT AT LA CROSSE, WISCONSIN

AD-A173 394



OTIC FILE COPY

REPORTS OF INVESTIGATIONS NUMBER 27
MISSISSIPPI VALLEY ARCHAEOLOGY CENTER

OCT 23 1986

A

3
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

6 10 17 055

PII Redacted

4D - 1123 312

REPORT DOCUMENTATION PAGE				Form Approved OMB No 0704-0188 Exp Date Jun 30 1986	
1a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED			1b. RESTRICTIVE MARKINGS		
2a. SECURITY CLASSIFICATION AUTHORITY			3. DISTRIBUTION/AVAILABILITY OF REPORT Approved for public release; distribution unlimited.		
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE					
4. PERFORMING ORGANIZATION REPORT NUMBER(S) Reports of Investigations #27			5. MONITORING ORGANIZATION REPORT NUMBER(S)		
6a. NAME OF PERFORMING ORGANIZATION Miss. Valley Archaeol. Center University of Wisconsin		6b. OFFICE SYMBOL (if applicable)	7a. NAME OF MONITORING ORGANIZATION U.S. Army Engineer District, St. Paul		
6c. ADDRESS (City, State, and ZIP Code) 1725 State Street La Crosse, Wisconsin 54601			7b. ADDRESS (City, State, and ZIP Code) 1135 USPO & Custom House St. Paul, Minnesota 55101-1479		
8a. NAME OF FUNDING/SPONSORING ORGANIZATION		8b. OFFICE SYMBOL (if applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER DACW37-84-M-0622		
8c. ADDRESS (City, State, and ZIP Code)			10. SOURCE OF FUNDING NUMBERS		
			PROGRAM ELEMENT NO.	PROJECT NO.	TASK NO.
11. TITLE (Include Security Classification) ADDITIONAL CULTURAL RESOURCES INVESTIGATIONS AT SELECTED PORTIONS OF THE STATE-ROAD COULEE-PAMMEL CREEK FLOOD CONTROL PROJECT AT LA CROSSE, WISCONSIN					
12. PERSONAL AUTHOR(S) Boszhardt, Robert F.; Gallagher, James P.; Theler, James L.; Bailey, Thomas W.; et. Al.					
13a. TYPE OF REPORT final		13b. TIME COVERED FROM _____ TO _____		14. DATE OF REPORT (Year, Month, Day) May 1986	
15. PAGE COUNT 200					
16. SUPPLEMENTARY NOTATION					
17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)		
FIELD	GROUP	SUB-GROUP	ARCHAEOLOGY		
			WISCONSIN		
			FLOOD CONTROL		
19. ABSTRACT (Continue on reverse if necessary and identify by block number) This report is a cultural resource investigation of three areas within the State Road Coulee-Pammel Creek flood control project area. The three areas include a downstream section of the Mississippi River floodplain at the mouth of Pammel Creek, and two adjacent areas upstream at the mouth of State Road Coulee. In project area I, shovel testing was unfeasible because of the high water table. It is recommended at a qualified archaeologist monitor the construction of the stilling basin in case cultural resources are located. Project area II should be spared disturbance because of the findings of Oneota cultural remains. Much of the sand rise in Project Area III was found to be disturbed from previous scraping. Therefore, this area appears not to contain significant cultural resources, and does not require additional investigation.---					
20. DISTRIBUTION/AVAILABILITY OF ABSTRACT ☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT. ☐ DTIC USERS			21. ABSTRACT SECURITY CLASSIFICATION Unclassified		
22a. NAME OF RESPONSIBLE INDIVIDUAL Jean M. Schmidt			22b. TELEPHONE (Include Area Code) 612-725-5921		22c. OFFICE SYMBOL IM-CL

ADDITIONAL CULTURAL RESOURCES INVESTIGATIONS
AT SELECTED PORTIONS OF THE STATE-ROAD COULEE - PAMMEL CREEK FLOOD CONTROL
PROJECT AT LA CROSSE, WISCONSIN

BY

ROBERT F. BOSZHARDT,
JAMES P. GALLAGHER,
JAMES L. THELER,
THOMAS W. BAILEY,
ARTHUR BETTIS,
And
DEAN THOMPSON

Principal Investigator: Dr. James P. Gallagher

REPORTS OF INVESTIGATIONS NUMBER 27
MISSISSIPPI VALLEY ARCHAEOLOGY CENTER
AT
THE UNIVERSITY OF WISCONSIN-LA CROSSE

Final Report Submitted in Partial Fulfillment of
Contract DACW 37-84-M-0622

May, 1986

TABLE OF CONTENTS

	<u>Page</u>
List of Figures	ii
List of Tables	iii
Management Summary	1
Introduction	2
Environmental Setting	7
Previous Investigations	13
Project Area I	14
Methods	14
Results	16
Project Area II	18
Methods	18
Results	18
Project Area III	26
Methods	26
Results	28
Oneota Midden	28
Lithics	35
Ceramics	40
Sand Rise	48
Low Area Southwest of Rise	50
Faunal Remains (Theler)	51
Floral Remains (Bailey)	62
Summary and Recommendations	69
References Cited	73
Appendix A: Geomorphology (Thompson and Bettis)	
Appendix B: Correspondence	
Appendix C: Field Records	
Appendix D: Scope of Work	
Appendix E: Resumes	

LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
1 Location of Project Areas (US 65 La Crosse 7.5' Quad).....	4
2 Location of Project Areas (1847 G.L.O. Plot of T15NR7W).....	8
3 Location of Project Areas (1894 M.R.C. Chart No. 172).....	9
4 Location of Project Areas (1914 adapted from Whitson et al.)	10
5 Location of Project Areas (Economic Resources Zones adapted from Gallagher and Stevenson 1982).....	12
6 Project Area I.....	15
7 Project Areas II and III.....	19
8 Upstream End of Flood Control Project (Hagen Road)	22
9 Paul Pickett Collection from Sand Rise South of Project Areas II and III.....	29
10 Piece Plot of Artifacts at Surface of Oneota Midden 47Lc176, T.P. 1.....	31
11 Excavation of T.P. 1, 47Lc176.....	32
12 Light Streaks at top of Oneota Midden, 47Lc176 Test Pit 1 control unit.....	32
13 Profile of West Wall of Test Pit 1, 47Lc176.....	33
14 West Edge of 47Lc176, Oneota Midden.....	36
15 Artifacts at West Edge of Midden.....	36
16 Lithic Tools from 47Lc176 Midden.....	38
17 Oneota Ceramics 47Lc176 (punctates filling zones).....	43
18 Oneota Ceramics 47Lc176 (finger trails).....	44
19 Oneota Ceramics 47Lc176 (tool trails and handles).....	45
20 Oneota Ceramics 47Lc176 (miscellaneous).....	46
21 Redeposited Woodland Ceramics (Bank Cut 0) 47Lc176.....	47
22 Cultigen Remains 47Lc176 Oneota Midden.....	63

LIST OF TABLES

	<u>Page</u>
1 Project Area II, Cut Bank Stratigraphy.....	20
2 Project Area II, Cut Bank Cultural Remains.....	24
3 Cultural Materials, Test Pit 1, 47Lc176 (Control Unit).....	34
4 Frequency of Cultural Materials Per Level 47Lc176 T.P.1.....	34
5 Cultural Materials, Bank Cullies 2x2, West Edge of Midden, and Test Pit 3, 47Lc176.....	37
6 Comparison of Lithic Source Materials, La Crosse Area Oneota Sites.	39
7 Radiocarbon Dates Available for La Crosse Area Oneota Sites.....	41
8 Comparison of Oneota Ceramic Traits, La Crosse Area Oneota Sites...	42
9 Cultural Materials, Test Pit 2 (Sand Rise) Project Area III.....	49
10 Faunal Remains Per Level, Test Pit 1 47Lc176.....	54
11 Faunal Remains, Selected Proveniences 47Lc176.....	55
12 Faunal Remains, Low Density Proveniences 47Lc176.....	57
13 Faunal Remains by Species.....	58
14 Floral Remains Test Pit 1 47Lc176.....	66
15 Floral Remains, Selected Proveniences 47Lc176.....	68



MANAGEMENT SUMMARY

In February 1984, the Mississippi Valley Archaeology Center entered into contractual agreement with the St. Paul District Corps of Engineers to conduct cultural resources investigations at three project areas within the State Road Coulee-Pammel Creek flood control project at La Crosse, Wisconsin. This action was sponsored by the St. Paul District in compliance with federal legislation concerned with the management of cultural resources. The purpose of these studies, as outlined in the scope of work, was to determine the presence or absence of cultural resources at Project Areas I and II, and to evaluate archaeological site 47Lc176 (Project Area III) according to criteria which would enable a determination of eligibility of the site for inclusion to the National Register of Historic Places.

The three investigated areas include a downstream section of the Mississippi River floodplain at the mouth of Pammel Creek, and two adjacent areas upstream at the mouth of State Road Coulee. The downstream area (Project Area I) is being considered for development into a stilling basin, and has not been investigated before. The upstream areas are situated in the floodplain of Pammel Creek and will be affected by stream channelization. The eastern (upstream) segment (Project Area II) had been previously surface inspected, however, deep testing was required due to historic sedimentation. The western segment (Project Area III) had been re-investigated with deep testing in 1983 resulting in the identification of a buried prehistoric site (47Lc176).

Phase I investigations at Project Area I consisted of systematic shovel testing. This technique was found to be unfeasible because the shovel test holes reached the watertable above pre-settlement surfaces. In light of recent findings of sub-watertable sites in the floodplain of Mississippi River Navigation Pool 10, and deeply buried sites along Pammel Creek at Project Area III, this area has not been determined void of cultural resources. However, due to logistical difficulty and excessive cost of sponsoring deep testing of Project Area I, it is recommended that the construction of the stilling basin be monitored by a qualified archaeologist with the ability to halt disturbing activities if cultural resources are located.

Phase I re-survey of Project Area II was accomplished through systematic bank cutting along Pammel Creek and through geomorphological coring. These efforts determined the eastern extent of the 47Lc176 Oneota midden and located a separate area of cultural remains. The latter area has been designated the State Road Coulee II site (47Lc191). The relationship and possible significance of the cultural remains at 47Lc191 should be evaluated in terms of criteria for inclusion to the National Register of Historic Places prior to destructive construction activities. If this site can be spared disturbance, no further investigation will be necessary.

Phase II investigation at Project Area III included extensive testing of an Oneota midden adjacent to Drive-In Road Bridge, a sandy rise in the center of the project area, and a deeply buried pre-settlement surface southwest of

the rise towards Ward Avenue bridge. These were accomplished through controlled test unit excavation, systematic shovel testing and deep (geomorphological) coring, and the excavation of backhoe trenches. Bank cuts in Project Area II identified the eastern edge of the Oneota midden. A bank cut in Project Area II clearly determined that the midden extends nearly 80 meters E-W, centered on Drive-In Road Bridge. A small test pit adjacent to Pammel Creek Road further determined that the buried midden extends 25 meters from Pammel Creek to the road. The midden was found to consist of a thick undisturbed deposit containing Oneota refuse. This deposit was sealed by 70-130cm of historic alluvium. The midden debris was not evenly distributed suggesting differential activity emphasis at certain locations. Furthermore, possible in-situ Woodland deposits were exposed at the base of the Oneota horizon.

The Oneota remains suggest that the midden lies adjacent to a habitation area (possibly south of Pammel Creek Road). Decorated ceramic sherds and types of lithic materials from the State Road Coulee midden compare to other Oneota sites in the La Crosse area which have been affiliated with the Orr Phase. Two radiocarbon dates from this midden indicate the age of the site at A.D. 1530-1550 $\pm$ 70. This site should be considered eligible for inclusion to the National Register of Historic Places and warrants further investigation in lieu of preservation.

Much of the sand rise in Project Area III was found to be disturbed from previous scraping. Along Pammel Creek a small area remains with a partially intact Natural A Horizon. This horizon contains sporadic Woodland and Oneota artifacts, however; no evidence of significant deposits such as cultural features were located on the sand rise. Therefore, this area appears not to contain significant cultural resources, and does not require additional investigation.

The west edge of the sand rise was located through deep soil coring. At this edge the pre-settlement surface dips and is buried by 2m of historic alluvium. Exposure of the pre-settlement surface in two backhoe trenches revealed scattered prehistoric artifacts including Oneota pottery. This area contains undisturbed cultural resources; although, it appears that these are of meager significance, and likely do not warrant additional controlled testing. However, it is recommended that this area be monitored during construction activities.

All materials and records obtained during these studies are curated at the Mississippi Valley Archaeology Center at the University of Wisconsin-La Crosse.

INTRODUCTION

Since 1977, the St. Paul District Corps of Engineers has complied with federal regulations concerning cultural resources in conjunction with the State Road Coulee-Pammel Creek flood control project at La Crosse, Wisconsin. This has included sponsoring Phase I survey of the entire project area and

Phase II evaluations of sites located therein. This report describes additional Phase I survey at two project areas, and Phase II testing at a third (see Figure 1).

These project areas represent two distinct floodplain settings separated by a Pleistocene terrace. Project Area I is located in the Mississippi River floodplain; a large and varied environmental zone including lakes, channels, sloughs, marshes, and islands. Project Areas II and III are located in the floodplain of Pammel Creek as it exits State Road Coulee. This area formerly contained a wetland created by blockage of the drainage by the sandy pleistocene terrace. Similar examples of wetlands at the mouths of small valleys and separated from the Mississippi River have been identified at the La Crosse terrace system.

Each of these floodplain settings is known to have been utilized for resources extraction or direct settlement by prehistoric groups. This has been especially documented for the late prehistoric Oneota. For example, wetland resources such as fish, shell, waterfowl, wild rice, crawfish, are common at Oneota sites. These remains indicate that wetland resources exploitation was a significant aspect of Oneota subsistence economy (Gallagher and Stevenson 1982). Many of these resources are known to have been obtained from the Mississippi River floodplain. Furthermore, recent investigations of a wetland at the mouth of Sand Lake Coulee has documented use of these settings for specialized ridged field agriculture by the Oneota (Gallagher et al. 1985, Boszhardt et al. 1985). Early historic records indicate that Project Areas II and III at the mouth of State Road Coulee were environmentally similar to Sand Lake Coulee.

Recorded prehistoric sites were only known for Project Area III prior to this study. At Drive-In Road, an Oneota midden (47Lc176) and possible ridged fields were located during a Phase I study sponsored by the St. Paul District Corps of Engineers (Boszhardt et al. 1983). Two major Oneota habitation sites, the Overhead site (47Lc20) and the Pammel Creek sites (47Lc61), are also known from terrace rises which are adjacent to Project Area I. Radiocarbon dates and ceramic affinities from these three sites indicate that they represent Orr Phase activities during the 13th to 15th centuries A.D.

Cultural resources investigations at the three project areas was detailed in the contractual scope of work, and are summarized below. The study was conducted by the Mississippi Valley Archaeology Center under the direction of Dr. James P. Gallagher. Robert Boszhardt served as project supervisor. A field crew of six experienced persons undertook the excavations from mid-April to early May, 1983. In addition, Arthur Bettis and Dean Thompson acted as geomorphological consultants. Laboratory processing and analysis was undertaken at the Mississippi Valley Archaeology Center. Specific analysis of the lithics and ceramics was conducted by Robert Boszhardt. Dr. James Theler undertook analysis of the faunal remains, and the floral materials were studied by Thomas Bailey and Leonard Blake (Washington University, St. Louis). All records and artifactual materials are curated at the Mississippi Valley Archaeology Center.

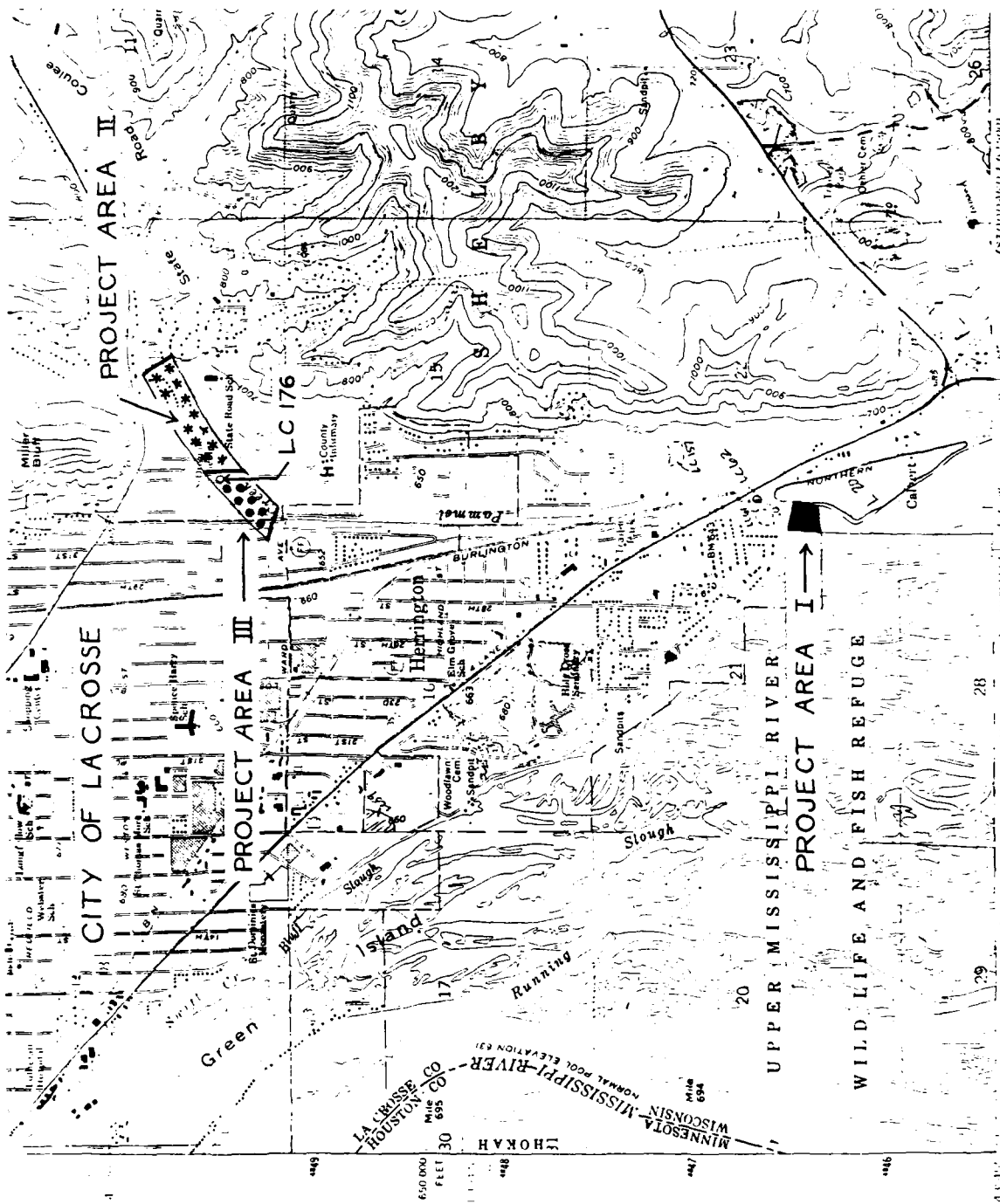


Figure 1—Location of Project Areas (USGS La Crosse 7.5' quad.).

Phase I survey was conducted at Project Area I and Project Area II. Project Area I consists of 4.5 acres of forested Mississippi River floodplain at the downstream end of the flood control project. This area is proposed to be included in the development of a stilling basin.

Survey methods here consisted of systematic shovel testing. Shovel tests were excavated to the depth of the water table; however, never reached the pre-Euro-American settlement surface. All of the sediments exposed and examined within Project Area I consist of alluvial silts and sands which have deposited since no earlier than ca. A.D. 1850. In light of recent discovery of deeply buried cultural horizons in the Mississippi floodplain at Pool 10 (Overstreet personal communication), it remains possible that comparable finds may be made at Project Area I. Therefore, it is not yet possible to state that cultural resources do exist within this area. Unfortunately, identification of such features is difficult and costly.

Project Area II is located at the upstream portion of the flood control project within State Road Coulee. This area is situated within the floodplain of Pammel Creek and is bounded by Pammel Creek, Pammel Creek Road, and Drive-In Road and an area just east of Hagen Road that marks the planned upstream end of the flood control project. The 1984 Phase I survey was actually the second survey of this area. Previously, the area had been walked over with negative results (Vehik 1977). Re-survey investigations of an adjacent area downstream (Project Area III) had located an Oneota midden (47Lc176) sealed beneath nearly 1 meter of historic alluvium (Boszhardt et al. 1983). This prompted the St. Paul District Corps of Engineers to sponsor re-survey of Project Area II.

The 1984 re-survey of Project Area II employed similar methods used in locating 47Lc176 in Project Area III. This was the excavation of bank cuts along the south edge of Pammel Creek. In addition, deep coring was undertaken away from the creek by geomorphological experts.

This study determined the eastern extent of the 47Lc176 midden (30 meters east of Drive-In Road), and located a second site locality (47Lc191) 210 meters to the east. This information will allow the development of an adequate management plan for 47Lc176, and a recommendation of Phase II evaluation of 47Lc191.

Project Area III is located immediately west of Project Area II and is bounded by Drive-In Road, Pammel Creek, Ward Avenue, and Pammel Creek Road. Phase II evaluation of 47Lc176 was undertaken at Project Area III. This included controlled excavations at the Oneota midden adjacent to Drive-In Road, a sandy rise approximately midway across the project area, and a buried surface to the southwest of the sandy rise nearer Ward Avenue. These were undertaken to determine the extent and nature of the midden and remains on the sandy rise, and possible relationships between the activities which occurred at these places. Of particular concern was determining whether the Oneota midden included ridged agricultural features. Finally, the area to the southwest of the sand rise was investigated to determine if cultural remains existed at all, due to the fact that bank cuts in 1983 were not able to reach

beneath deep deposits of historic alluvium.

Investigations at the Oneota midden included the excavation of two control units (Test Pits 1 and 3), additional bank cuts, and geomorphological coring. These revealed that the midden extends 38 meters to the west of Drive-In Road, and encompasses the area from the creek to Pammel Creek Road. Possible evidence of ridging was detected at the surface of the buried midden, which is capped by 70cm to 130cm of historic alluvium. The midden is approximately 90 cm thick and may overlie in-situ Woodland deposits. Differential artifact distribution was documented between the central portion of the midden and the west edge. In the central portion (Test Pit 1), artifacts are generally small in size, consisting of Oneota sherds, thinning and finishing flakes, a few stone tools, and extremely high quantities of charred cultigens (especially corn). The west edge of the midden produced large sections of Oneota vessels, large faunal remains such as an antler and deer maxilla, and larger pieces of lithic debitage including cores and primary reduction flakes. This suggests that the central portion of the midden may approach a living area. In sum, this site is extremely significant and warrants further management concerns.

The sandy rise to the east of the Oneota midden was investigated through the excavation of a 2x2 meter control unit at the location where a Phase I bank cut had recovered a few artifacts from a Natural A Horizon. In addition, shovel test holes and geomorphological coring traced the edge of this horizon, and located the east and west edges of the rise. Backhoe trenches were also excavated in order to expose a larger sample of the sandy rise.

These studies determined that both Woodland and Oneota remains exist on the sandy rise. These are few in number, are restricted to the Natural A Horizon. The rise was found to have been scraped and much of the A Horizon removed. No evidence of significant cultural features was encountered on the sand rise, and this area does not warrant further cultural resources study.

Backhoe excavation was necessary to expose the pre-settlement surface to the southwest of the sand rise. Two trenches (A and D), and several deep cores determined that this surface is buried by as much as 2.5 meters of historic alluvium. Oneota artifacts consisting of a few small sherds, charcoal, fire-cracked rock, and lithic debitage were found at the buried surface. The sample suggests that their density is much less than at the Oneota midden near Drive-In Road bridge.

The report includes an environmental overview and summarizes relevant previous cultural resources investigations before describing the methods of the study. The methods and results of each project area are described separately. Detailed descriptions of ceramics, lithics, faunal and floral remains are presented in the body of the text. The geomorphological study is presented as an appendix. Additional appendices include field records, personal resumes, the scope of work, and pertinent correspondence including Blake's floral study, radiocarbon samples, and reporting of 47Lc191. These are preceded by a summary of the study and recommendations for future management.

ENVIRONMENTAL SETTING

The three project areas are located within the Western Uplands geographical province of Wisconsin (Martin 1965). This province encompasses much of the well known Driftless Area, a region that lacks direct evidence of Pleistocene glaciation (Michelson et al. 1982). The lack of glacial action is reflected in mature dendritic drainage systems that have deeply dissected the local bedrock formations. Three distinctive physiographic zones are present in the immediate vicinity of the project areas: the dissected uplands, the Pleistocene terraces, and the lowland floodplain of the Mississippi River.

Physiography

The local uplands consist of Ordovician dolomitic bedrock overlying Cambrian sandstones. These formations are capped with a mantle of aeolian loess. These deeply dissected uplands are characterized by narrow rounded ridges that have resisted weathering, and steep-sided valleys forming dendritic drainage patterns. The permeable bedrock acts as an aquifer, releasing groundwater through numerous springs. The bedrock formations also contain chert nodules and silicified sandstone deposits which were used by prehistoric people for the manufacture of stone tools. The uplands are most pronounced along the Mississippi River trench, where several 150 m. bluffs mark the edge of the valley.

The Mississippi River Valley formed by rapid downcutting during the torrential release of glacial meltwater. Due to the weak structure of the local Cambrian sandstone, the Mississippi Valley is unusually wide at La Crosse. As the glacial meltwaters slowed, vast quantities of sand and gravel outwash were deposited in the valley. Later downcutting by the river into these deposits left terraces along the valley margins. Because of the excessive width of the trench at La Crosse, this portion of the Upper Mississippi Valley contains extensive terrace deposits. Many of these terraces were modified by wind action, forming sand dunes.

An interesting pattern is evident near La Crosse, where the terraces frequently dip along the base of the bluffs. Martin interpreted this bluff-base depression, which originates to the north, as an abandoned channel of the La Crosse River (1965:159). In earlier times, several small non-glacial tributaries drained into wetlands formed in these depressions at the base of the bluffs. The drainage of these low areas was blocked by the large terraces between the bluffs and the Mississippi floodplain. Pammel Creek, for example, is recorded on 1847 Government Land Office Survey documents as flowing from State Road Coulee (a small non-glacial valley) into a wetland, located at the mouth of the coulee, on the east side of the Pleistocene terrace (Boszhardt and Gallagher 1983; Brown 1847). This is the setting of Project Areas II and III. This creek later was channelized so that it now flows southward, forming the north edge of Project Area I shortly before it joins a slough of the Mississippi River. However, the early records do not indicate that the creek followed this course prior to channelization. Figures 2-4 show the setting of

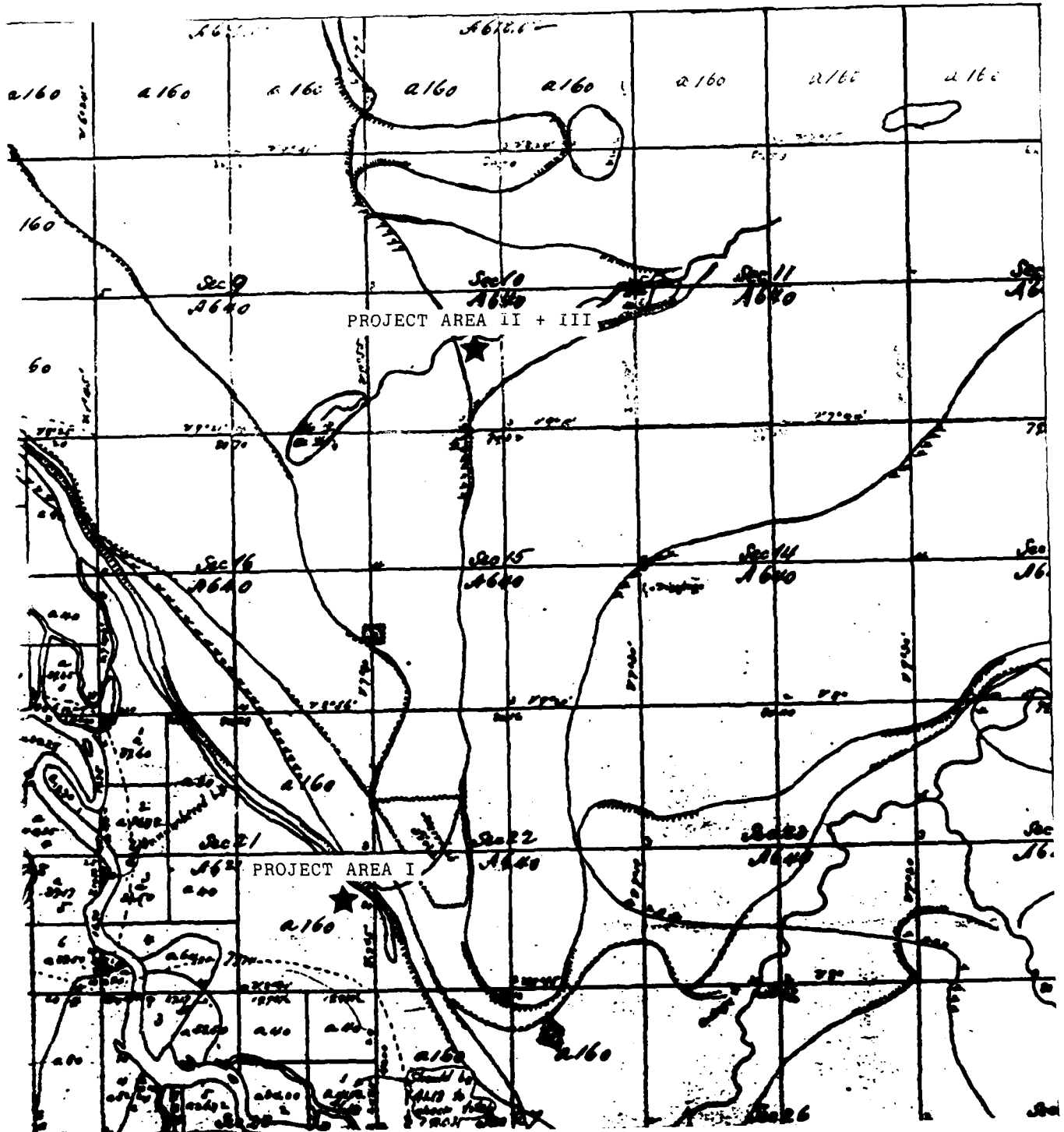


Figure 2- Location of PROJECT AREAS (1847 G.L.O. plat of T15N, R7W).

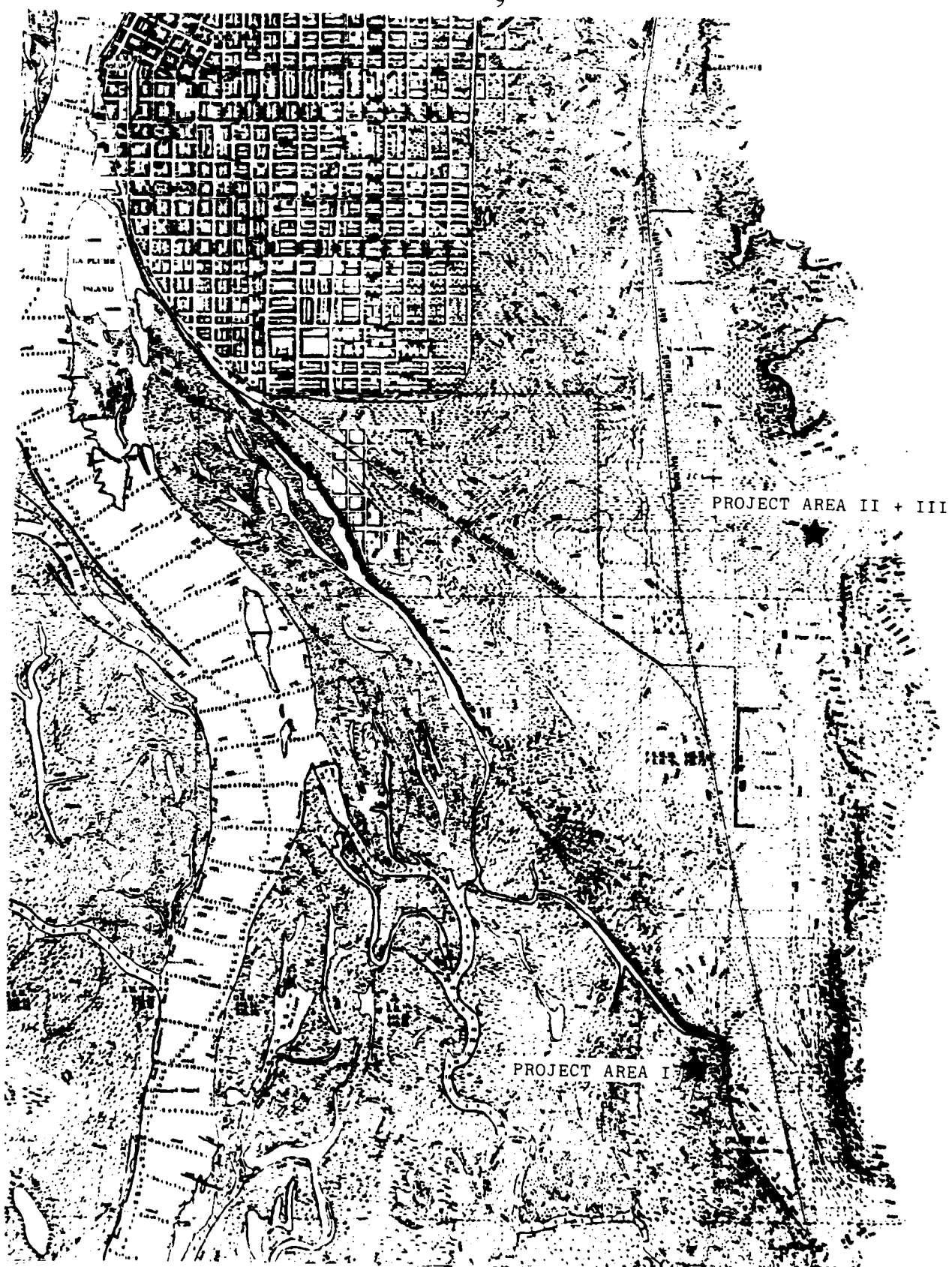


Figure 3- Location of PROJECT AREAS (1894 M.R.C. chart No. 172).



Figure 4 - Location of PROJECT AREAS (1914 adapted from Whitson et al).

the project areas on a series of historic maps.

The Mississippi floodplain is a broad corridor of low islands, marshes, ponds, lakes, sloughs, and channels. The soils of the present floodplain typically are fine silts and sands, deposited over Pleistocene outwash within the Holocene Epoch.

Vegetation and Fauna

Each of the three local physiographic zones supported distinct biotic communities prior to Euro-American alterations. Gallagher and Stevenson (1982) have utilized historic records to reconstruct the environment of the La Crosse area, and identified six economic resource zones: (1) dry uplands; (2) sandy prairie and (3) oak savanna, both located on the terraces; and (4) dry bottomlands, (5) wet bottomlands, and (6) open water, all associated with the lowland floodplains of the Mississippi, La Crosse, and Black Rivers (see Fig. 5).

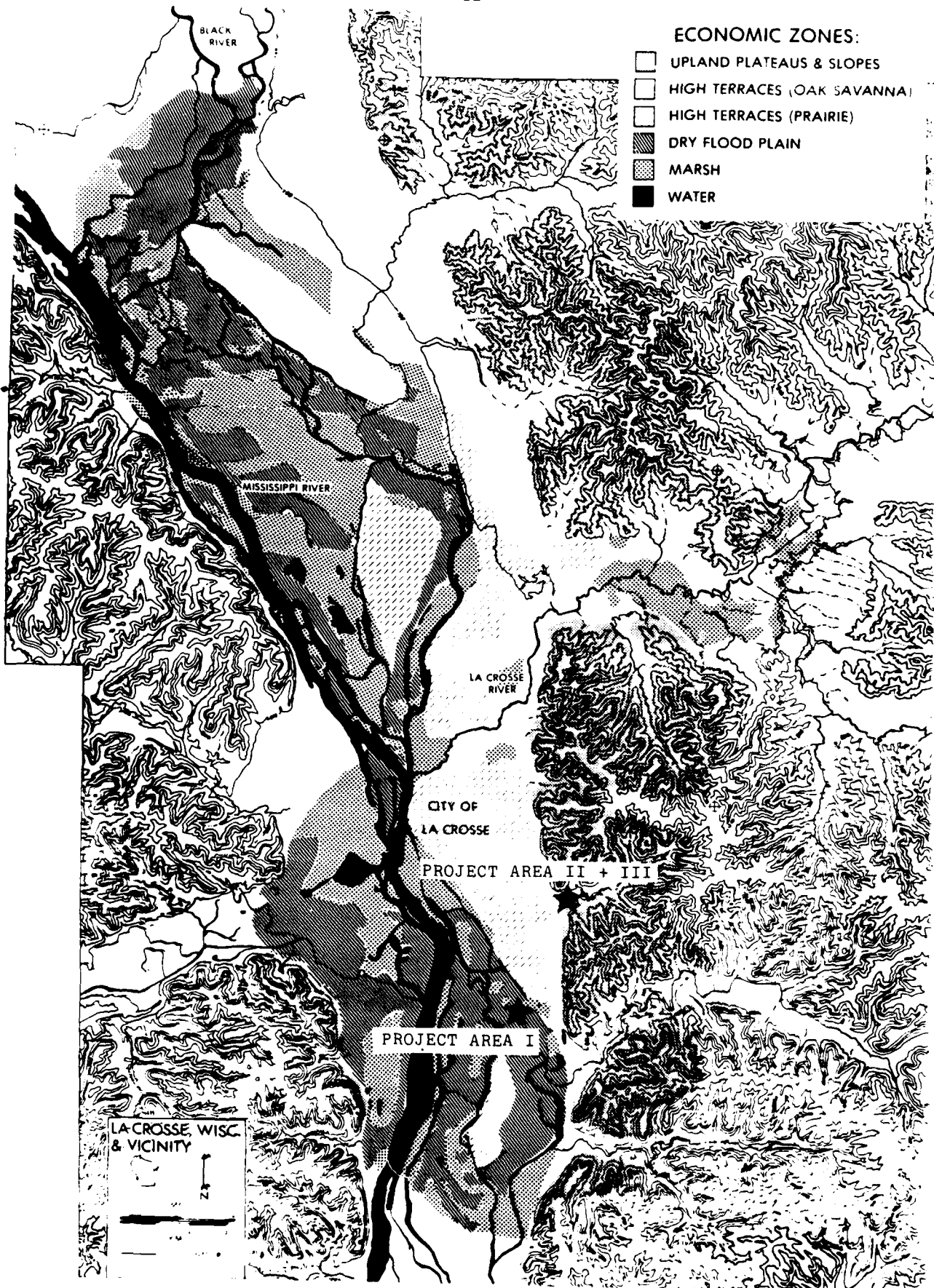
The dry uplands supported a mosaic of vegetative communities, including prairie/oak savanna on the rounded upland ridge tops; mesic forests of birch, basswood, and maple on north- and east- facing slopes; and dry oak/hickory forests and cedar glades ("goat prairies") on south- and west- facing exposures. Resources associated with this zone would have included nuts, berries, and other fruits, white-tailed deer, and other large and small mammals, and birds.

The sandy prairie and savanna zones may have provided fewer food resources. However, they would have supported jackrabbit, ground squirrel, game birds, and possibly elk and bison. Furthermore, the well-drained nature of these areas, and their easy access to the floodplain would have made the terraces ideal locations for prehistoric settlements.

The dry bottomlands include areas vegetated with silver maple, river birch, cottonwood, ash, elm, and an understory of viny plants such as wild grape and poison ivy. These areas supported deer, raccoon, squirrel, and beaver. The wet bottomland zone includes wet prairies, sedge meadows, and tamarack bogs containing plant species such as willow, reeds, cattail, lotus, arrowleaf, and in places wild rice and cranberries. These areas would have supported waterfowl (abundant during migration) and riparian mammals such as beaver, muskrat, and otter. Resources exploited from open water zones would have been fish, fresh-water mussels, and waterfowl.

Climate

Generalized climatic reconstructions are available for the Driftless Area throughout the Holocene (Bartlein and Webb 1982; Knox et al. 1981). Local historical records offer glimpses of the La Crosse region during early Euro-American settlement, beginning in the mid-seventeenth century. However, detailed information for most of the Holocene environment of La Crosse is not available. Today, the climate of the La Crosse area is humid continental, with extreme seasonal variation in temperature. The area annually receives an



Figures 5— Location of PROJECT AREAS (Economic Resources zones adapted from Gallagher and Stevenson 1982).

average of 29.9 inches of precipitation. The average yearly temperature is 46 degrees (F.), with an average growing season of 163 days (Beatty 1960, Claflin 1973). One especially interesting phenomenon is the ameliorating climatic affect of the Mississippi trench. Records indicate that the temperatures within the trench are often several degrees warmer than upland localities of the same latitude. This effect increases the growing season within the trench by approximately 15 days (Cawley 1973).

PREVIOUS INVESTIGATIONS

Early on during the State Road Coulee Flood control project, Phase I cultural resources survey was undertaken for the upstream portion (Vehik 1977). That investigation consisted of a walkover inspection only, which resulted in a lack of findings and no recommendation for additional study.

The inadequacies of the 1977 walkover survey at the urbanized upstream corridor prompted the St. Paul district Corps of Engineers to undertake additional investigations in 1983. These were conducted at the upstream segment between Drive In Road and Ward Avenue (equivalent to Project Area III). The resurvey of this area resulted in the location of an Oneota midden (47Lc176) in wetland sediments which had been sealed by nearly 1 meter of historic alluvium (Boszhardt and Gallagher 1983.) An apparent undulating surface of the Oneota horizon, and its analagous setting to the Sand Lake Site (47Lc44) suggested that 47Lc176 might represent a second example of Oneota ridged field agricultural fields.

The State Road Coulee Site (47Lc176) was recommended for Phase II evaluation. In addition, the findings prompted recommendations for resurvey of other portions of the flood control project which also might contain buried cultural resources not detected during the initial walkover survey.

Investigations of the proposed downstream, sedimentation basin at the mouth of Pammel Creek began with a shovel test survey in 1980 (Hays et al. 1981). This survey resulted in the location of the Pammel Creek Site (47Lc61). Additional Phase II investigations at this site were undertaken in 1983, and resulted in a determination that the site was an intensive Oneota habitation locality dating to the 15th century A.D. (Boszhardt et al. 1984a). The site is primarily located adjacent to the west edge of the city of La Crosse's portion of the proposed sedimentation basin. Planned preservation of the majority of the Pammel Creek Site has negated, for the time, need for Phase III investigations, however; monitoring of the construction has been recommended.

PROJECT AREA I

This area consists of 4.5 acres of forested floodplain of the Mississippi River. The forest is made up primarily of silver maple, cottonwood, and elm, with a dense understory of nettle. The surface dips gradually from an elevation of 638 feet (A.S.L.) at its north end to 633 feet (A.S.L.) at the southern tip. The south and west edge of the project closely correspond with the forest edge and a wet prairie which continues to the mouth of Pammel Creek and a backwater channel of the Mississippi. The area is inundated annually in the spring of the year.

An artificial levee (berm) along the south bank of Pammel Creek forms the northern boundary of the project area. To the west is a sand terrace rise of 3 feet at the north end, and 8 feet at the south end.

Historic records (Brown 1847, M.R.C. 1894, Pammel 1907, and Whitson et al. 1914) indicate that Pammel Creek did not junction with the Mississippi near Project Area I. Rather, the creek was blocked by the east edge of the La Crosse terrace at the mouth of State Road Coulee (Boszhardt et al. 1983; see Project Area III). However, pre-lock and dam maps (see Figs. 2-4) indicate that a backwater slough followed the western base of the terrace to the project area.

Project Area I was considered of potential archaeological significance for several reasons. First, the adjacent sand terraces to the north and east contain major archaeological sites. To the north, opposite Pammel Creek, is the Pammel Creek site (47Lc61). This site was partially excavated in 1983 (Boszhardt et al. 1984) and found to contain the remains of a dense Oneota occupation. Immediately east and on the higher terrace sands is the north end of the large Overhead site (47Lc20). The north portion of this site contains an Oneota component (Stoltzman 1973, Sasso 1984). Further south, the Overhead site contains Middle Woodland remains including Hopewellian influenced burials (Gallagher et al. 1981), and Millville Phase habitation (Sasso 1984).

That Project Area I lies in the immediately adjacent floodplain to these two sites offered the possibility of its containing related activity remains. This was felt especially true for the Oneota components because La Crosse area Oneota sites typically contain large quantities of wetland resources subsistence indicators (eg. fish, shell, waterfowl, crayfish, wild rice, etc.). Furthermore, recent excavations at the Sand Lake Site (47Lc44) have documented Oneota wetland ridged agricultural fields (Boszhardt et al. 1984b, Gallagher et al. n.d., Boszhardt et al. n.d.). Finally, a wetland at the mouth of State Road Coulee was found to contain an Oneota midden (47Lc176) and a possible second example of wetland ridged fields (Boszhardt and Gallagher 1983, see Project Area III).

Methods

The scope of services for Project Area I called for a Phase I survey. Unfortunately, the project area presented two conditions which made this a

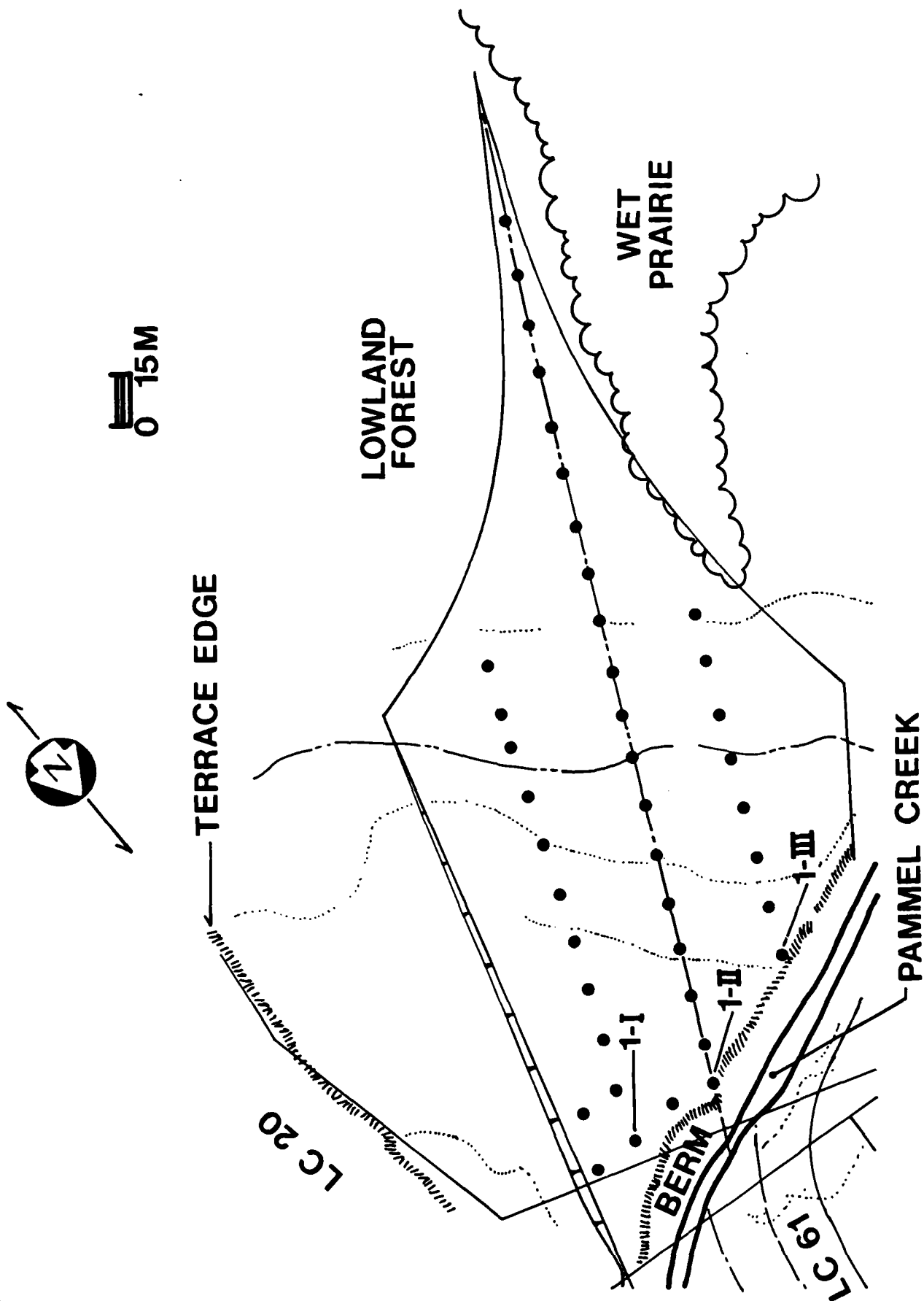


Figure 6 - PROJECT AREA I.

goal extremely difficult. First, the fact that the area is forested restricted the opportunity to inspect exposed sediments which might contain evidence of cultural resources. The few tree falls seen were examined, however; the primary survey method utilized was systematic shovel testing.

As an archaeological survey technique, shovel testing has numerous limitations. First, employing a systematic 15-meter interval between shovel holes exposes only an extremely small percentage of the survey area. Therefore, the sample of the survey area which is actually examined is minimal. It is generally acknowledged that archaeological sites may be located utilizing the shovel testing technique; however, if no evidence of cultural remains is observed in the shovel test sample, it cannot be stated that a site does not exist within a survey area. Second, it is difficult to maintain vertical control over the contexts of materials recovered during the excavation of the shovel hole. (Vertical control may be established if shovel hole walls are scraped with a trowel, and materials are then encountered from in-situ contexts.) Thus, when a site is located through shovel testing, follow-up test excavations are usually needed to identify the nature of the cultural deposit. Third, depending on surface cover and soil types, shovel testing (including screening of the soils) is a time-consuming endeavor. Shovel testing is basically an inefficient survey technique in terms of sample size and cost efficiency; however, in vegetated survey areas with little or no exposed ground, it is the best method currently available.

A second condition of Project Area I made even shovel testing unfeasible for adequate survey. Because of the floodplain setting of the project area, it has been subjected to increased sedimentation during historic times. In the La Crosse area, this would have begun about 1850 with American settlement. Although the depth of historic sedimentation was not known for Project Area I, investigations in the floodplain of State Road Coulee (Pammel Creek) have documented several feet of historic sediments (Boszhardt and Gallagher 1983). The rather sudden increase in upland erosion since historic farming is reflected in local floodplains as sharply contrasting light colored redeposited loess and sands capping the earlier organically enriched developed soil surfaces.

Without knowing the depth of historic sedimentation, shovel testing was conducted at Project Area I. Shovel Test holes were 35 - 40 cm in diameter, and excavated to the watertable with depth and soil conditions recorded. The shovel test holes were placed in three parallel NE-SW transects (see Fig. 6). Additional shovel test holes were excavated at the extreme northeast corner of the area due to its higher elevation and proximity to the Overhead site. Within each transect, shovel test holes were excavated at 15 meter intervals. A total of 41 shovel test holes were excavated in this project area.

Results

As noted earlier, each shovel test hole was excavated to the depth where the water table was encountered. At the higher north end of the project area, the water table was reached at a depth of 125 cm below the surface. To the south, as the present surface dips, the water table was encountered just beneath the surface. Below the water table, collapsing walls prevented useful

continuation of the shovel tests.

Throughout the project area, only bedded sands and light colored silts were exposed by shovel testing to the water table. These are interpreted as representing redeposited sand from the Pleistocene terrace and redeposited loess from the uplands which very likely were washed out by Pammel Creek after it became channelized. No evidence of a stable (i.e. uniform organic) horizon was encountered. The lack of stable surface features in the Project Area I shovel tests indicates that all of the sediments above the watertable are of recent historic origin. Undoubtedly at lower depths a stable pre-historic soil surface exists, which might contain cultural remains related to the Pammel Creek or Overhead site occupations, or even earlier components. The depth of that surface was not determined. No cultural materials were found in the Project Area other than very recent debris at the present surface.

PROJECT AREA II

This area is a narrow grassy strip bounded by Pammel Creek, Pammel Creek Road and Drive-In Road and a widening just east of Hagen Road (see Fig. 7). The area is generally 800m long and generally 25m wide, but narrows towards Hagen Road to less than 5m wide. East of Hagen Road at the collective beginning of the proposed flood control development, the area widens to nearly 60 meters south of Pammel Creek, in addition to a levee spur on the north side of the Creek (see Figure 8).

This area had been surface inspected by Vehik who saw no archaeological or historic material (1977:E2). Based on the discovery of the State Road Coulee site in the Pammel Creek floodplain immediately south of Project Area II (Boszhardt and Gallagher 1983), and the possibility of additional buried cultural resources within this setting, the St. Paul District Corps of Engineers requested a resurvey of Project Area II.

Methods

This was accomplished by the excavation of bank cuts along the south edge of Pammel Creek, and through coring of the grassy strip. Bank cuts were excavated with shovel and trowel to create a stratigraphic profile (generally 1 meter wide). Recognized historic alluvium was not screened; however, all sediments not recognized as historic alluvium were screened through 1/4" mesh standard hardware cloth. Profiles were inspected and descriptions including depths, texture, munsell color, and presence/absence of cultural remains recorded (see Appendix B).

A total of 26 bank cuts were excavated in Project Area II. Bank cuts 0-13 were placed at 30 meter intervals along the Creek. An additional 4 bank cuts (O/A-O/D) were excavated between bank cuts 0 and 1 near Drive-In Road. The latter were excavated in order to determine the eastern extent of the 47Lc176 Oneota Midden (Fig. 7). Nine cuts were excavated at the Hagen Road widening (Figure 8), with their locations in part dictated by land owner permission to survey. For example, permission was not obtained for the Hruska and Wentworth properties, and consequently no bank cuts were excavated on these lands. However, the coverage for the adjacent Larson, Nelson, and Stry properties, and apparent uniform geomorphic setting suggests that the results of the surveyed lands at this portion of Project Area II, may be interpolated for the unsurveyed land.

Results

The bank cuts revealed highly variable stratigraphy and location of cultural remains (see Table 1). In general, however, these showed that the entire project area west of the Nelson property is mantled by deposits of historic alluvium. Variability was found in underlying strata which include areas of developed soils, separated by former stream channels. The developed soils consist of an organically stained Natural A Horizon underlain by B and C Horizons. These had all developed in fine sands and were located in Bank Cuts 0, O/A, O/B, O/C, O/D, 4, 5, and 7.

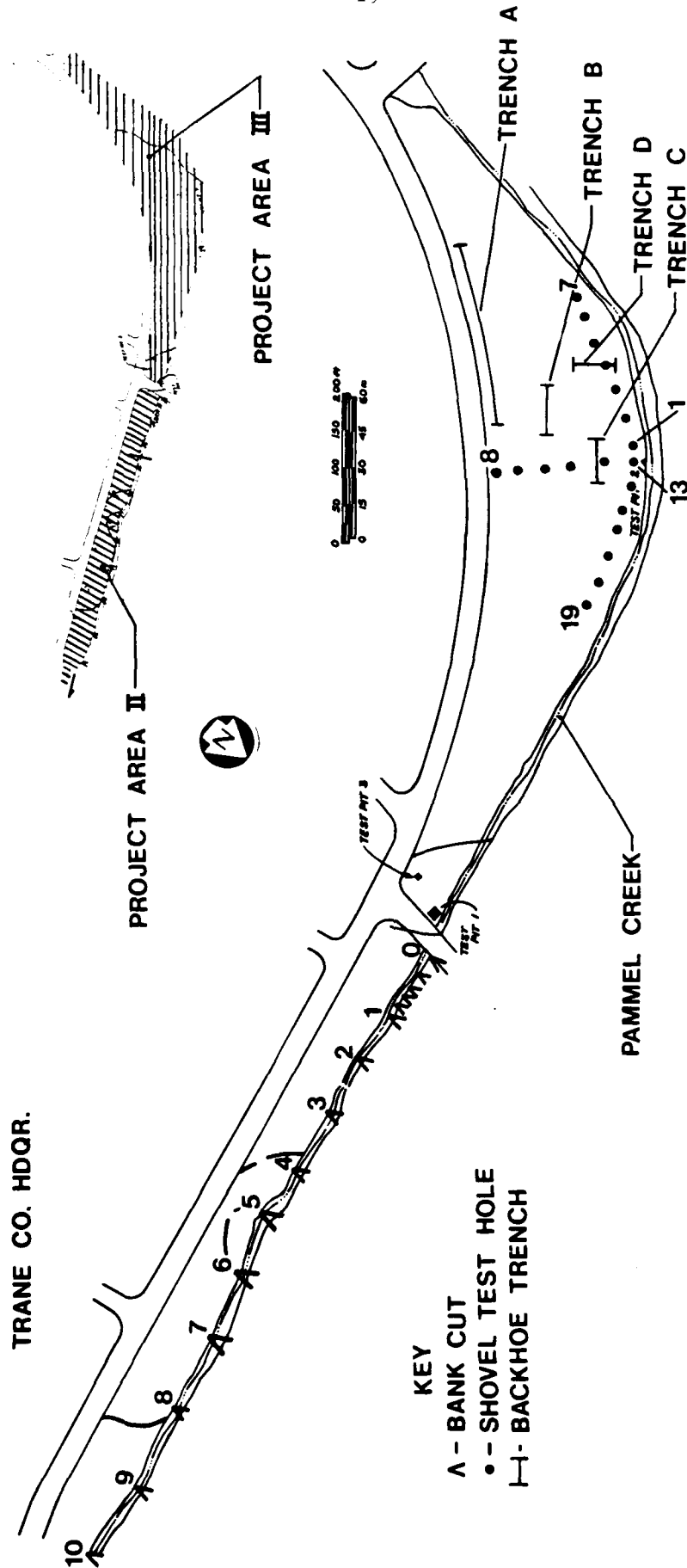


Figure 7 - PROJECT AREA II and III.

Table 1: Project Area II Bank Cut Stratigraphy

<u>Bank Cut 0</u>	0-140cm	East Edge Drive-In Road Bridge
0- 55cm	Hist. alluvium	
55- 140	Dark sandy silt (Natural A Oneota Midden)	
base	Coarse sand iron concentrations, gleyed silts (redeposited Woodland materials)	
<u>Cut 0/A</u>	0-130cm	15m East of Drive-In Road Bridge
0- 45	Hist. alluvium	
45- 130	Dark sandy silt (Natural A Oneota and Woodland materials)	
<u>Cut 0/B</u>	0-130cm	7.5cm East of Drive-In Road Bridge
0- 60	Hist. alluvium	
60- 130	Dark sandy silt (Natural A Horizon)	
<u>Cut 0/C</u>	0-130cm	20m East of Drive-In Road Bridge
0- 70	Recent vegetation	
70- 118	Hist. alluvium	
118- 130	Dark silt (Natural A Horizon)	
<u>Cut 0/D</u>	0-180cm	25m East of Drive-In Road Bridge
0- 50	Recent vegetation	
50- 120	Hist. loess	
120- 142	Dark silt (gleyed) (Nat. A-saturated)	
142- 180	Coarse sand- Iron concentrations and gleying; stream channel	
<u>Cut 1</u>	0-150cm	30m East of Drive-In Road Bridge
0- 150	Hist. alluvium	
55- 150	East side-gulley with gleyed silts-Oneota pottery	
<u>Cut 2</u>	0-160cm	60m East of Drive-In Road Bridge
0- 160	Hist. alluvium	
160-	Gleyed silts	
<u>Cut 3</u>	0-120cm	90m East of Drive-In Road
0- 40	Hist. alluvium	
40- 120	Gleyed silts iron concentrations (former channel)	

Table 1: Continued

<u>Cut 4</u>	0-130cm	120m East of Drive-In Road
0- 50	Hist. alluvium	
50- 120	Dark sand (Natural A Horizon)	
120- 130	Lights and (Natural A Horizon)	
<u>Cut 5</u>	0-125cm	150m East of Drive-In Road
0- 45	Hist. alluvium	
45- 80	Dark sand - (Natural A Horizon)	
80- 125	Light sand (Nat. A Horizon) gleyed at base	
<u>Cut 6</u>	0-90cm	180m East of Drive-In Road
0- 90	Hist. alluvium gleyed at base	
<u>Cut 7</u>	0-105cm	210m East of Drive-In Road
0- 35	Hist. alluvium	
35- 105	Dark sand (Nat. A Horizon) Oneota materials	
<u>Cut 8</u>	0-130cm	240m East of Drive-In Road
0- 104	Hist. alluvium	
56- 104	Hist. alluvium glazed	
104- 130	Stream gravel (brick)	
<u>Cut 9</u>	0-135cm	270m East of Drive-In Road
0- 135	Hist. alluvium	
<u>Cut 10</u>	Hist. alluvium	300m East of Drive-In Road
<u>Cut 11</u>	Road fill	330m East of Drive-In Road
<u>Cut 12</u>	Hist. alluvium	360m East of Drive-In Road (some gleying throughout)
<u>Cut 13</u>	Hist. alluvium	390m East of Drive-In Road Road fill

Figure 8: Upstream end of Pammel Creek flood control project showing locations of property owners and surveyed areas.

Stream channel soils varied from coarse sands to clayed and banded silts. These were found between the areas with developed soils, and also underlay the natural soil horizons.

Stream sediments were the only soils observed in Bank Cuts 1, 2, 3, 6, 8, 9, 10, and 12. Bank cuts 11 and 13, adjacent to Pammel Creek Road, consisted of road fill. Because Pammel Creek Road closely parallels and in fact straightens Pammel Creek from Bank cut 10 to Hagen Road, and only road fill or stream deposits were encountered in Bank cuts 10-13, excavations of Bank cuts to the northeast and along the road were discontinued. This area, is undoubtedly disturbed by the road fill, and very probably does not contain in-situ cultural remains.

The results of coring away from the creek bank are presented in detail in Appendix A. In general, these refine the locations and interpretations of the various soil types seen in the bank cuts.

Cultural materials were recovered from Bank Cuts 0, O/A, 1, 7, and 8 (see Table 2). In Bank Cuts 0, O/A, and 7, Oneota materials were recovered from the Natural A Horizon, and represent in-situ cultural deposits. Bank Cuts 0 and O/A represent an eastern extension of the Oneota midden at 47Lc176. Oneota materials at Bank Cut 1 were situated in apparent redeposited contexts (possibly a gully). Thus, the maximum eastern extent of 47Lc176 should be considered as Bank Cut 1, 30 meters east of Drive-In Road.

Approximately 180 m separated Bank Cut 1 from Bank Cut 7 where the only other in-situ cultural remains were located. These consisted of an Oneota pottery sherd, fire-cracked rock, and charcoal recovered from the Natural A Horizon. This horizon was not seen at Bank Cuts 6 or 8, 30 meters into the west and east of Bank Cut 7. Therefore, the cultural remains at Bank Cut 7 appear to represent a distinct site location from 47Lc176. This site has been reported to the State Archaeologist and designated 47Lc91 (see Appendix B). This site is probably closely related, however, to the Oneota activities represented at 47Lc176.

Besides the Oneota remains within the A Horizon at Bank Cut 0, late Middle Woodland ceramics were recovered from coarse, iron stained sands beneath. Geomorphological interpretation of these indicated that the Woodland materials are not in their primary context. Rather, these appear to have been redeposited during flood episodes (see Appendix A). The size of the sherds suggests that they were not transported a great distance, and further imply a late Middle Woodland site a short distance upstream. No evidence of remaining portions at that site were identified in the project area. Finally, the cultural materials from Bank Cut 8 consist of brick fragments. These were recovered from historic alluvium 1 meter below the surface, indicating the depth in places of historic sedimentation.

The widened upstream area near Hagen Road, and encompassing the Nelson, Wentworth, Larson, Stry, and Hrusku properties was found to be a completely different geomorphological landform than the western portion of Project Area II. The upstream end represents a sandy bench much like the downstream sand rise between Drive-In Road and Ward Avenue. All the bank cuts at this area

Table 2: Project Area II Bank Cuts Cultural Remains

Bank Cut 0 (East side Drive-In Road Bridge)

2 Secondary flakes
 5 Tertiary flakes
 11 chips
 3 Decorated shell-tempered sherds
 4 Undecorated shell-tempered sherds
 28 Grit-tempered sherds from redeposited stream channel
 8 Bone
 1 Shell
 Charcoal

Cut 0/A (15m east of Drive-In Road Bridge)

1 Point
 1 Retouched flake
 1 Notched flake
 1 Abrader
 1 Primary flake
 9 Secondary flakes
 27 Tertiary flakes
 51 Chips
 59 Decorated shell-tempered sherds
 2 Decorated grit-tempered sherds
 22 Undecorated shell-tempered sherds
 23 Undecorated grit-tempered sherds
 69 Bone
 14 Shell
 Charcoal

Bank Cut 1 (30m east of Drive-In Road Bridge)

7 Undecorated shell-tempered sherds

Bank Cut 7 (210m east of Drive-In Road Bridge)

1 Undecorated shell-tempered sherd
 1 FCR
 Charcoal

Bank Cut 8 (240m east of Drive-In Road Bridge)

8 Pieces brick

encountered a natural soil development in a fine sand base, with the exception of two. These exceptions were recent alluvium in a filled ox bow on the Larson property, and dark fill capping much of the natural sand bench at the Nelson property.

The natural sandy beach found at all of the other seven bank cuts at the widened upstream end of Project Area II stands nearly 10 feet above the creek, and has the appearance of a likely prehistoric site location. The bank cuts revealed a stratigraphic profile of a Natural A Horizon truncated by historic cultivation (fine sand 0-20 cm), over a fine sandy B Horizon (20-30 cm), which blended into a C-Horizon. No cultural materials were recovered or observed in any of the bank cuts into the natural sand bench. In addition, this area was partially surveyed by surface inspections of the Larson garden which occupies an approximately 12 x 25 meter area on the natural sand rise south of the creek. Surface visibility in the garden was restricted by stubble from last years harvest, but it was estimated that 40% of the ground surface was exposed. No artifacts were found in the garden, supporting the negative results of the nearby seven bank cuts.

PROJECT AREA III

This area consists of a grassy field bounded by Pammel Creek to the north and west and Pammel Creek Road to the south and west. It lies between Drive-In Road and Ward Avenue, and corresponds with the area resurveyed in 1983 (Boszhardt and Gallagher 1983).

The 1983 resurvey located an Oneota midden and possible ridged fields (47Lc176) adjacent to Drive-In Road Bridge. In addition, traces of pre-historic activity were recovered from the central portion of the project area where a sandy rise was masked by grading and historic alluviation. Towards the southwest end of the project area, historic alluvium was found to be exceptionally thick, precluding identification of the prehistoric surface.

The scope of services for the 1984 investigations called for Phase II evaluation of 47Lc176. This included test excavations aimed at determining the extent and content of the Oneota midden (eg. are ridged fields present?). Furthermore, the relationship of the midden to the sand remains on the sand rise to the west was to be investigated, and extensive geomorphological study was called for in order to evaluate the sedimentological history of the varying deposits observed in 1983. Together, these topics were aimed at evaluating the project area and known sites in terms of criteria for determining the eligibility for inclusion to the National Register of Historic Places.

Field Methods

Phase II investigations at Project Area III including test excavations at the Oneota midden 47Lc176 and on the sand rise where a few prehistoric materials had been recovered in 1983. In addition, shovel testing was conducted at the sandy rise, and geomorphological coring was undertaken throughout the area. Finally, backhoe trenches were excavated to the base of historic sediments at the southwest portion of the area.

Phase II test excavations consisted of controlled units oriented according to cardinal direction. These began with the removal of historic alluvium. Upon reaching earlier horizons, excavation proceeded in arbitrary levels unless natural strata were recognized. All soil beneath the historic alluvium was screened through 1/4" mesh hardware cloth with the exception of matrix samples taken for water screen or flotation processing at the laboratory. Recovered materials were bagged and labeled according to provenience. Field excavations forms were utilized to record basic information from each level. In addition, wall profiles were examined and photographed or mapped. All units were backfilled immediately upon completion. A total of three test units were excavated at Project Area III (Fig. 7). Test Unit 1 was excavated to evaluate the context and integrity of the Oneota midden at Lc176 based on 1983 bank cut information. The 5m long 1983 bank cut was re-exposed for use as a stratigraphic guide for a 5 x 5 meter square. The 1983 Bank Cut 1 closely corresponded with the north wall of this unit. Upon removing the historic alluvium, and exposing the surface of the Oneota midden, the unit was restricted to a 2 x 2 meter unit in the southwest corner of the 5 x 5 meter

square. The 2 x 2 control unit was excavated through the Oneota midden deposit.

Test Pit 3 was a 1 x 1 meter unit excavated to the south of Test Unit 1. This unit was excavated in order to identify the southern extent of the Oneota midden. Its location is shown on Fig. 7. Only one 10 cm level of the midden was removed.

Laboratory Analysis

Laboratory processing included washing, sorting and cataloging of all recovered remains. Matrix samples were either water screened through graduated screen mesh sizes (as small as 1/18") or floated to separate light fraction (charcoal) from heavy fraction (lithic, ceramics, etc.). All of the remains recovered from Project Area II and III are catalogued between Accession numbers 84.01 - 84.92 and are being curated at the Mississippi Valley Archaeology Center.

Analyses of ceramics include sorting by temper and decoration. Decorated sherds were compared to regional ceramic classifications for cultural identification and regional relationships. Lithics were sorted into tool types (points, knives, scrapers, etc.) and reduction categories based on form characteristics. The latter include cores, biface stages from cores (Type 1) to finished tools (Types 3-6), waste flakes (designated primary, secondary, and tertiary based on the amount of cortex on the dorsal surfaces), and chips (all flakes less than 2cm). Projectile points usually represent the only culturally diagnostic lithic tools, and these were compared to regional point typologies for cultural affiliation determinations. Other tools were useful for interpreting activities occurring at the site.

Lithic materials were also analyzed for source materials (e.g. local chert, identifiable non-local chert, silicified sandstone, etc.). Studies of lithic source materials at other Oneota site assemblages has shown differential patterns between some sites (see Boszhardt et al. 1984 a:39; Boszhardt et al. 1984 b:36-38). These differences may reflect differential trade relations or travel preferences of local Oneota groups.

Faunal remains were analyzed by James L. Theler. His identification and results are presented in a later section of this report. Floral remains were identified by Thomas W. Bailey, the results of which are also presented in a separate section of the report.

RESULTS

47LC176 Oneota Midden

Phase II testing at 47Lc176 revealed a substantial amount of information regarding the condition and extent of the Oneota midden, the remains on the sandy knoll, and a deeply buried surface to the southwest of the sandy knoll. The following provenience units produced information directly from the Oneota midden: Test Pits 1+3, Bank Gullies 1+2, and a bank cut at the west edge of the midden. In addition, some of the materials from Bank Cut O, O/A, O/B, O/C, O/D, and 1 of Project Area II area directly related to the midden.

These indicate that the midden extends nearly 30 meters east of Drive-In Road bridge, beneath the bridge (approximately 10 meters wide) and 38 meters to the west. Furthermore, the midden extends southward at least to Pammel Creek Road (25 meters from the creek). South of Pammel Creek Road is the landscaped corporate headquarters of the Trane Company. It is not known if or how far the Oneota midden might extend on to that land; however, several persons familiar with the area indicated that there was formerly a sandy rise in that direction, and that when cultivated, prehistoric materials were collected. Figure 9 illustrates a private collection reportedly from the sandy rise where the Trane Company offices now stand. Interestingly, the projectile points suggest occupations much earlier than the Oneota component. In summary, the 47Lc176 midden extends at least 78 meters E-W by 25 meters N-S. While the E-W boundaries are clear, the north and south extent remains undetermined.

Test Pit I was excavated specifically to determine whether or not the midden was also part of a ridged field system. Oneota ridged fields have been identified at the Sand Lake site (47Lc44) (Gallagher et al. 1985, and Boszhardt et al. 1985) which is located at a nearly identical setting to 47Lc176. Furthermore, the State Road Coulee midden appeared to be ridged in a 1983 Bank Cut (1) profile, as well as having produced an unusually large quantity of charred corn (Boszhardt and Gallagher 1983).

The 1983 Bank Cut 1 profile was re-exposed to guide the excavation of a 5x5 meter control unit (Test Pit 1) and trace the possible ridges. The overlying historic alluvium was skim shoveled off looking for possible historic features. During this process recent disturbance from the construction of Drive-In Road Bridge was observed along the eastern wall. Miscellaneous recent historic artifacts such as leather sandals and a partially filled wine bottle were found deep in the banded alluvium. No prehistoric remains were observed.

At a depth of 68 cm below the SE corner of the 5x5 control unit, the interface between the historic alluvium and the Oneota midden surface was clearly observed. This interface represents a soil change from light banded fine silts and sands (10YR5/4) to dark organic fine sands (10YR3/1). Furthermore, prehistoric artifacts are restricted to the underlying midden.

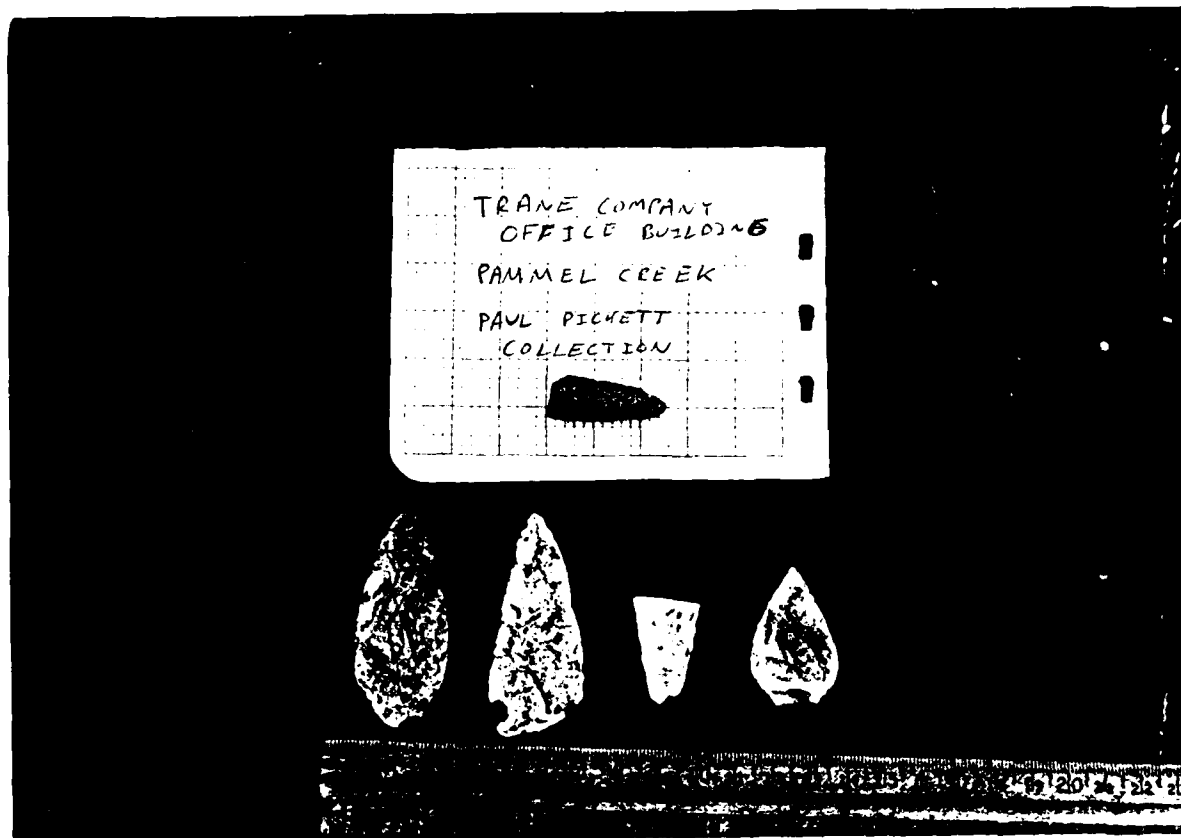


Figure 9—Paul Pickett collection from sandrise south of PROJECT AREAS II and III.

Artifacts at the surface of the midden were piece plotted (Fig. 10).

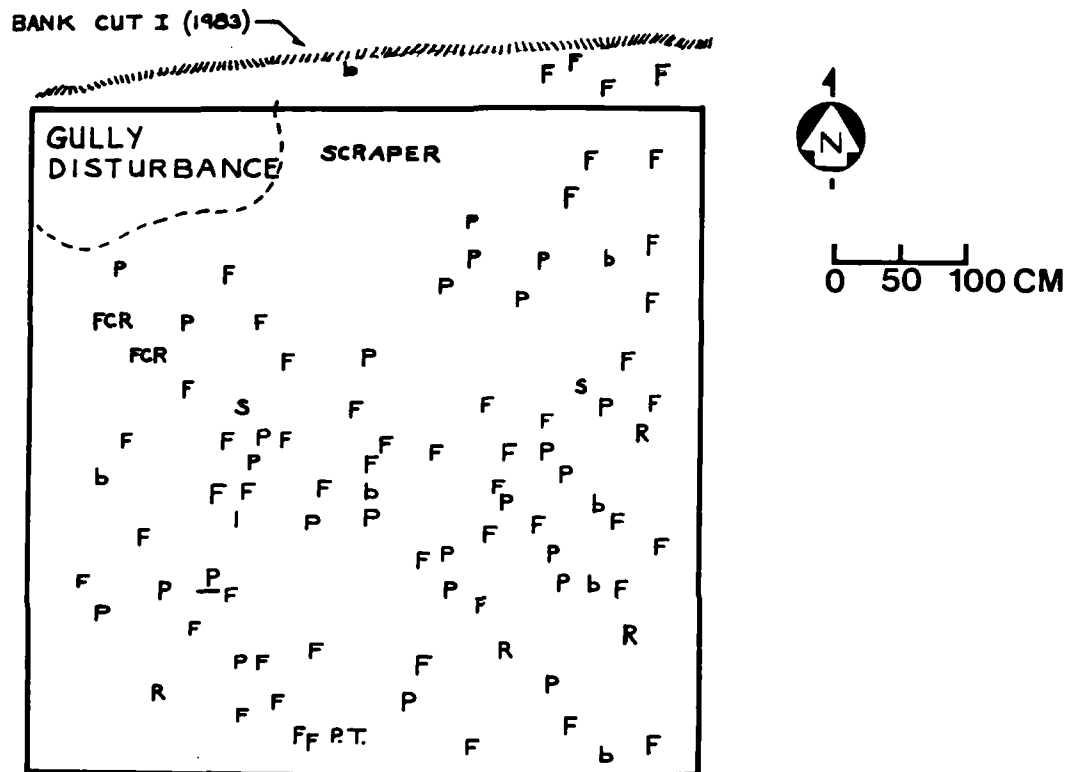
A few anomalies were also seen intruding into the midden. For example, gleyed bands of light silts and mottled light and dark sediments were observed at the northwest corner of the unit. Prehistoric artifacts were recovered from the mixed sediments which corresponds with Zone D of the 1983 Bank cut 1 (Boszhardt and Gallagher 1983:16-18). Initially, this zone was interpreted as possibly representing a reconstructed ridge such as have been observed at the Sand Lake site. In plan view, however, it was clear that Zone D is a small sediment filled gulley.

In addition, rough diagonal streaks of light sediment were found running WSW-ENE at the surface of the midden (see Fig. 12). These were suspected of being early settlement, animal drawn plow scars, which filled with the initial historic alluvium. However, in the west wall profile the shape of the intrusive light soil (Zone B1) suggested possible filled ridge swales (Fig. 13). The remainder of the midden surface was very flat offering little indication of ridging. Based on these excavations and those of Bank cut 1 in 1983, it is not possible to state absolutely whether or not the 47Lc176 Midden was ridged for agricultural purposes. The possibility that it was is supported by the undulating surface of the 1983 Bank cut 1 profile (see Boszhardt and Gallagher, 1983. Figure 5-7), the apparant alluvium filled swale-like features encountered in 1984, the recovery of vast quantities of corn and beans, and a broken bison scapula hoe from the midden, and the comparable setting to the Sand Lake Site (47Lc44) where unquestionable Oneota ridges have been located. However, the possible ridges at State Road Coulee are not nearly as clearly defineable as those at Sand Lake Coulee.

A 2x2 meter control unit was continued in the southwest corner of the original 5x5 meter unit. The control unit was excavated through the midden deposits. The midden at that location is 92 cm thick. At that depth, the soil changed to a clay (10YR3/6). A few artifacts were recovered in the sub-soil including Woodland sherds and a possible feature. Unfortunately, time did not permit further excavation. This layer may represent in-situ Woodland deposits which are related to the redeposited Woodland remains found in Bank Cut 0 (see Project Area III). Table 3 lists the materials recovered from Levels 1-10 of the 2x2 meter control unit. The individual levels are combined here due to the overall uniformity in material types recovered per level. For example, all the pottery sherds are shell-tempered and corn kernals (representing the majority of the floral remains-see Baileys section of this report) were recovered from each level. However, the quantity of materials varied per level with the arbitrary level 5 representing the densest artifactual layer with 2698 artifacts (Table 4).

The artifact assemblage from the midden within the control unit is noteworthy in several respects. All five of the projectile points (recovered from Levels 1, 2, 3, and 6) are small triangular forms and conform to the style common at Oneota sites. Few other stone tools were recovered, but these include small implements such as a scraper, and retouched flakes. The debitage does not include cores or primary flakes indicating that only finishing tool waste flakes were deposited here. As noted earlier, all of the ceramics from the Oneota midden horizon within the control unit are shell-tempered

STATE RD. COULEE
47 LC 176
CONTROL UNIT
TOP OF MIDDEN



KEY

R-ROCK
P-POTTERY
P-RIM
F-FLAKE
b-BONE
S-SHELL
F.C.R.-FIRE CRACKED ROCK
P.T. - POINT TIP

Figure 10 Piece plot of artifacts at surface of ONEOTA midden 47LC176, T.P.1.



Figure 11—Excavation of T.P.1, 47LC176.

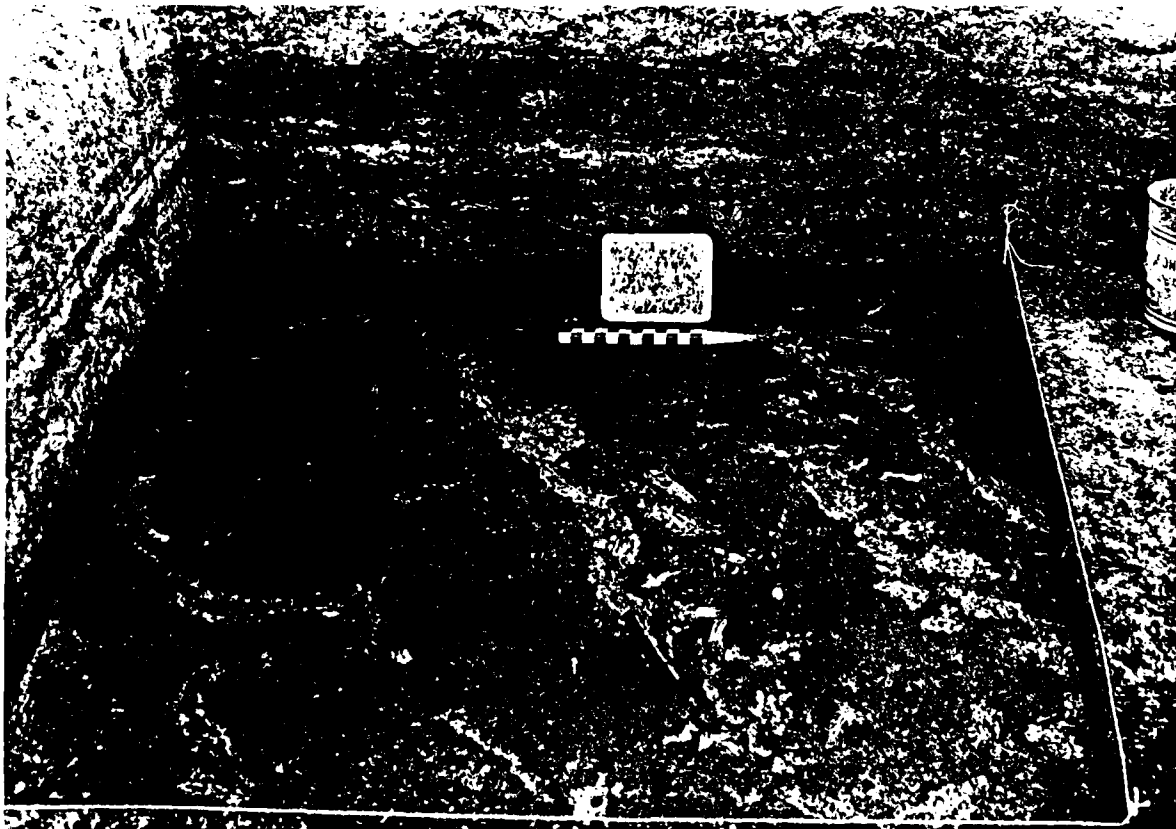


Figure 12—Light streaks at top of ONEOTA midden, 47LC176.

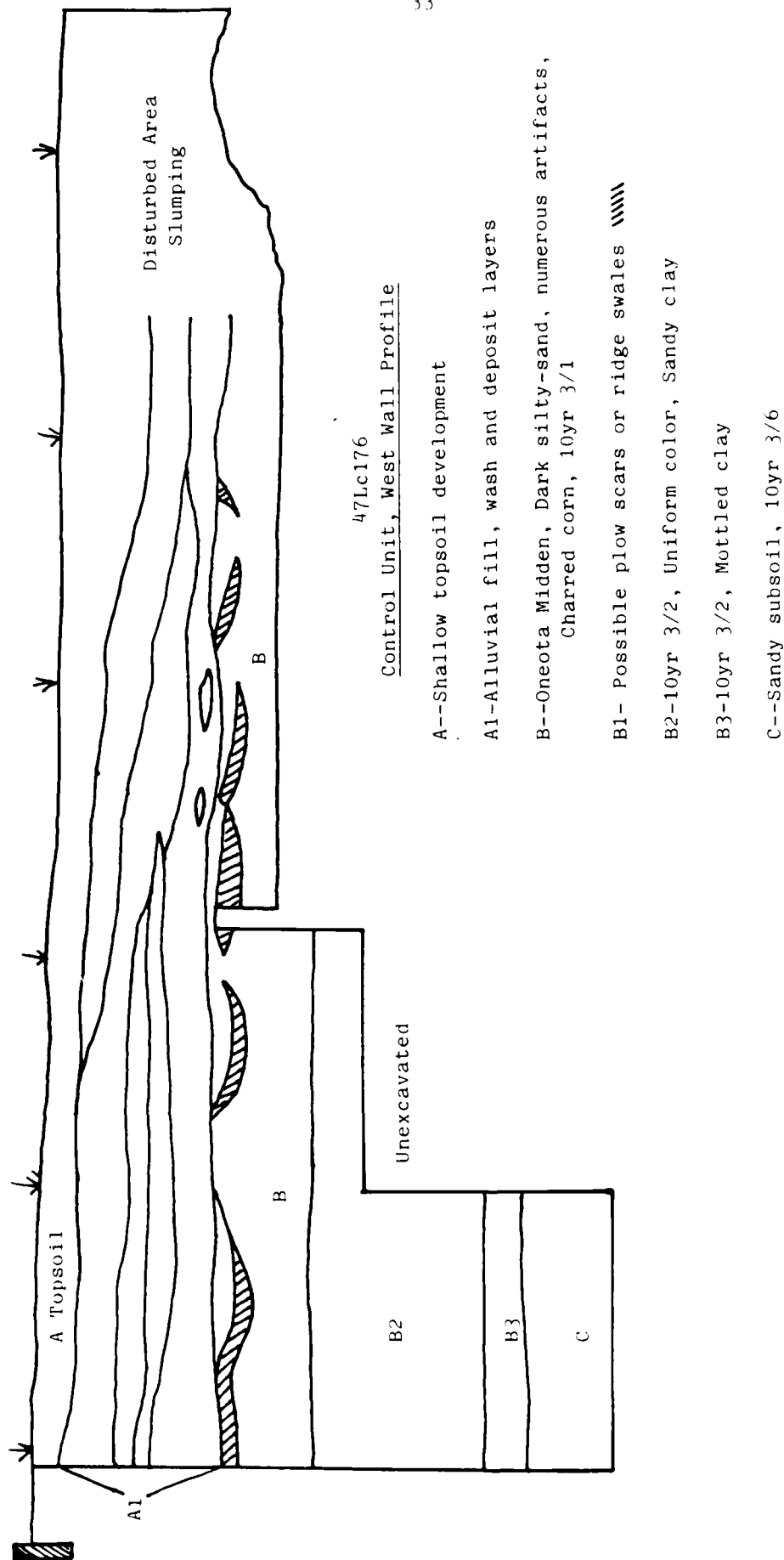


Figure 13- Profile of west wall of Test Pit 1, 47Lc176.

Table 3: Test Pit 1 Control Unit

Materials Levels Combined

5	projectile points
9	bifaces
1	end scraper
4	retouched flakes
1	bipolar core
13	secondary flakes
112	tertiary flakes
782	chips
782	chunks
28	rock
63	decorated shell-tempered sherds
1276	undecorated shell-tempered sherds
485	faunal
4258	floral
12	FCR
3	historic

Table 4: 47Lc176 Cultural Materials per ProvenienceTest Pit 1 -- 2x2 meter Control Unit

<u>Level</u>	<u>Total Artifacts</u> (including identified floral)
1	116
2	309
3	612
4	1406
5	2698
6	855
7	221
8	73
9	89
10	67

sherds. Again, these were relatively small in size. The faunal and floral remains are detailed in following sections. In general, however, the faunal remains from the control unit consist of small sized fragments. The floral is particularly noteworthy in the massive quantity of charred cultigens. For example, over 1960 whole charred corn kernels and 189 beans were recovered from the control unit. This quantity is unique from excavated La Crosse area Oneota sites.

Interestingly, the recovered midden remains from Bank Gullies 1+2, and the west edge of the midden (Table 5) differ somewhat from those from the Test Pit 1. Although the ceramics from the west edge of the midden are also shell-tempered and indicative of Oneota activity, the sherds include large vessel portions. Furthermore, lithics from the west edge of the midden include a few primary flakes and a core. Faunal materials include larger elements such as a bison scapula, deer maxilla and antler (Fig. 15). Furthermore, there were substantially fewer cultigen remains away from Test Pit 1, although a charred corn cob was recovered from Bank Gully 1.

Overall comparison of materials from the midden proveniences indicate rather intensive Oneota activities, with differential distribution. The smaller size of materials from the control unit suggests that this area may have been selectively cleaned, while those at the west edge of the midden indicate dumping of larger refuse materials. As such it appears that the control unit location approaches a living area.

A sample of charred wood from level 5 of the control unit was submitted to the University of Wisconsin Radiocarbon lab for assay, and yielded a date of A.D. 1530±70 (Wis 1617). This date closely corresponds with a date of A.D. 1550±70 (Wis 1594) obtained from a sample of charred corn recovered from the 1983 Bank Cut 1 (Boszhardt et al. 1983). Together, these samples strongly indicate that the midden is a result of Oneota activity in the 16th century A.D.

Lithics

The stone tools recovered from the midden proveniences are characteristic of Oneota assemblages (Fig. 16). These include triangular projectile points, endscrapers, and retouched flakes. The lithic debitage is dominated by secondary thinning flakes and finishing tertiary flakes and chips with few cores and primary flakes. These suggest that the Oneota inhabitants were finishing and re-sharpening their stone tools at this site. There was apparently little emphasis on reducing raw material into cores or preforms.

A variety of lithic source materials is represented in the midden assemblage. The percentages of material sources represented at the 47Lc176 midden compares to the Pammel Creek site (47Lc61) assemblage suggesting trade or travel relationships to the south (Boszhardt et al. 1984a). Table 6 compares lithic source materials from several La Crosse Area Oneota sites. This indicates that silicified sandstone is more prevalent at the northern sites (47Lc76 and 47Lc185). These sites are located adjacent to the Black River which headwaters near the silicified sandstone quarry at Hixton, Wisconsin.



Figure 14— West edge of 47LC176, ONEOTA Midden.



Figure 15—In Situ artifacts at west edge of midden.

sherds. Again, these were relatively small in size. The faunal and floral remains are detailed in following sections. In general, however, the faunal remains from the control unit consist of small sized fragments. The floral is particularly noteworthy in the massive quantity of charred cultigens. For example, over 1960 whole charred corn kernels and 189 beans were recovered from the control unit. This quantity is unique from excavated La Crosse area Oneota sites.

Interestingly, the recovered midden remains from Bank Gullies 1+2, and the west edge of the midden (Table 5) differ somewhat from those from the Test Pit 1. Although the ceramics from the west edge of the midden are also shell-tempered and indicative of Oneota activity, the sherds include large vessel portions. Furthermore, lithics from the west edge of the midden include a few primary flakes and a core. Faunal materials include larger elements such as a bison scapula, deer maxilla and antler (Fig. 15). Furthermore, there were substantially fewer cultigen remains away from Test Pit 1, although a charred corn cob was recovered from Bank Gully 1.

Overall comparison of materials from the midden proveniences indicate rather intensive Oneota activities, with differential distribution. The smaller size of materials from the control unit suggests that this area may have been selectively cleaned, while those at the west edge of the midden indicate dumping of larger refuse materials. As such it appears that the control unit location approaches a living area.

A sample of charred wood from level 5 of the control unit was submitted to the University of Wisconsin Radiocarbon lab for assay, and yielded a date of A.D. 1530 $\pm$ 70 (Wis 1617). This date closely corresponds with a date of A.D. 1550 $\pm$ 70 (Wis 1594) obtained from a sample of charred corn recovered from the 1983 Bank Cut 1 (Boszhardt et al. 1983). Together, these samples strongly indicate that the midden is a result of Oneota activity in the 16th century A.D.

Lithics

The stone tools recovered from the midden proveniences are characteristic of Oneota assemblages (Fig. 16). These include triangular projectile points, endscrapers, and retouched flakes. The lithic debitage is dominated by secondary thinning flakes and finishing tertiary flakes and chips with few cores and primary flakes. These suggest that the Oneota inhabitants were finishing and re-sharpening their stone tools at this site. There was apparently little emphasis on reducing raw material into cores or preforms.

A variety of lithic source materials is represented in the midden assemblage. The percentages of material sources represented at the 47Lc176 midden compares to the Pammel Creek site (47Lc61) assemblage suggesting trade of travel relationships to the south (Boszhardt et al. 1984a). Table 6 compares lithic source materials from several La Crosse Area Oneota sites. This indicates that silicified sandstone is more prevalent at the northern sites (47Lc76 and 47Lc185). These sites are located adjacent to the Black River which headwaters near the silicified sandstone quarry at Hixton, Wisconsin.



Figure 14- West edge of 47LC176, ONEOTA Midden.



Figure 15-In Situ artifacts at west edge of midden

Table 5: Materials from Oneota Midden 47Lc176Bank Gully #1

1 projectile point
 1 sidescraper
 1 retouched flake
 2 utilized flakes
 2 secondary flakes
 16 tertiary flakes
 7 chunks
 41 chips
 104 undecorated pottery (all shell-tempered)
 17 decorated pottery (all shell-tempered)
 134 faunal
 6 floral
 2 historic
 1 FCR
 211 other

Bank Gully #2

1 secondary flake
 3 tertiary flakes
 1 chunk
 4 chips
 12 undecorated pottery (all shell-tempered)
 2 decorated pottery (all shell-tempered)
 38 faunal
 1 FCR
 29 other

Bank Cut W. Edge of Midden

1 biface
 1 bone tool
 1 core
 1 retouched flake
 4 primary flakes
 21 secondary flakes
 33 tertiary flakes
 3 chunks
 81 chips
 94 rocks
 16 undecorated pottery (all shell-tempered)
 43 decorated pottery (all shell-tempered)
 826 faunal
 1 floral
 1 FCR
 9 other

Test Pit #3

1 tertiary flake
 11 chips
 7 undecorated pottery (all shell-tempered)
 19 faunal
 2 floral
 3 other

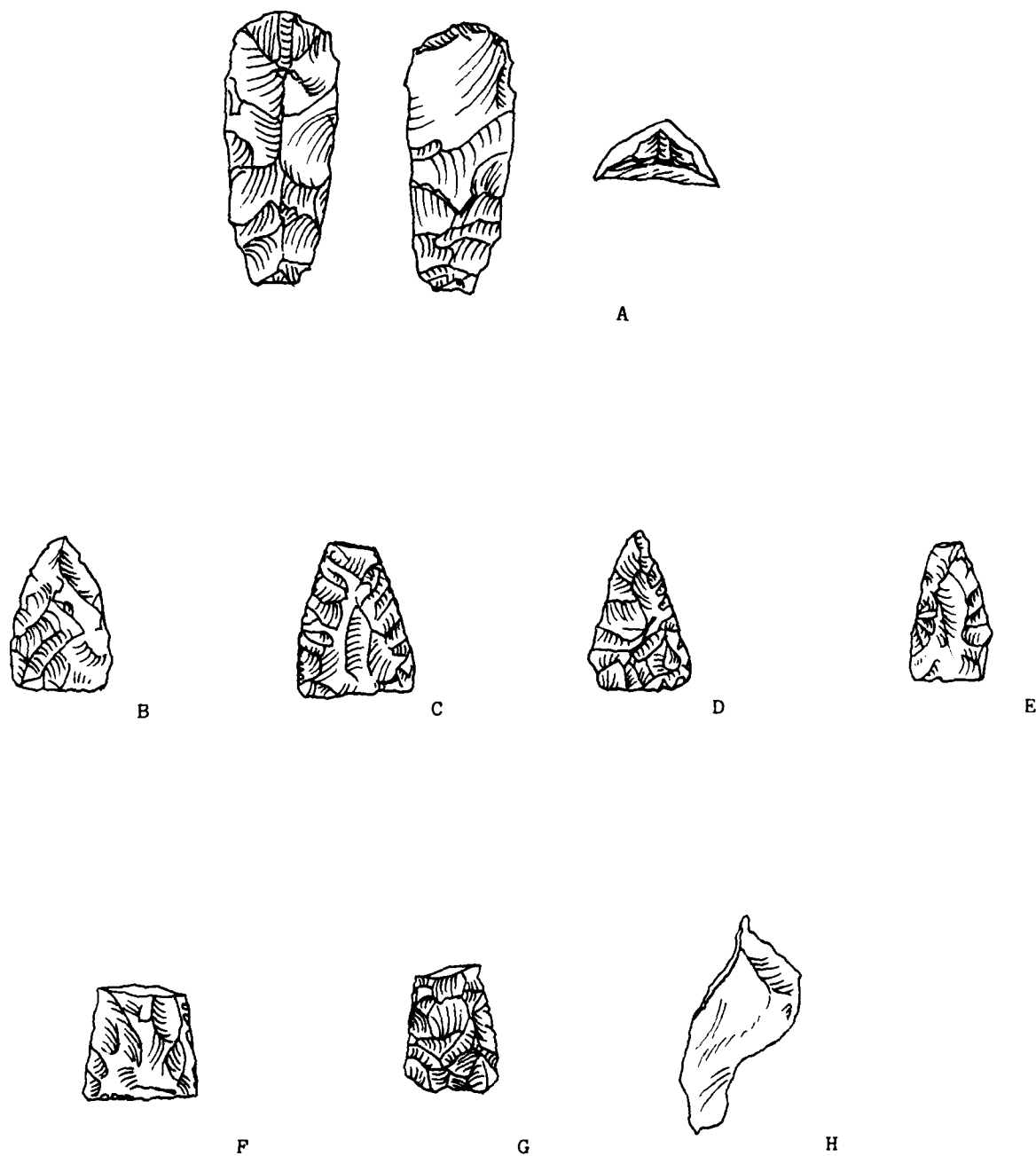


Figure 16—Lithic tools from 47LC176 Midden.

A: Adz

B-G: Triangular projectile points

H: Graver

Table 6: La Crosse Area Oneota Sites
Comparisons of Lithic Source Materials (%)

	1390+70	1340+70	1450-1480+70	1430-1520+70	1530-1550+70	1482-1510	?
	Lc76	Lc185	Lc44	Lc61	Lc176	Lc20	Lc34
Olsen	N. Shore F.-2	Sand Lake	Pammel	State Road	Overhead	Valley View	
Local Chert	X	3.7	91.77	35.8	64.4	60	50
						L.-11	L.-12
Silicified Sandstone (N)	87.92	88.2	7.78	3.4	.3	1.5	1.91
Burlington (S)	1.9	.13	12.2	3.2	15.4	37.5	9.72
Galena (S)	X	.02	23.6	11.9	10	5	2.21
Silurian (S)	.6	.05	2.03	14.6			
Moline (S)		.01	.68	.6			
Grand Meadow (W)	X	2.1	.07				
Obsidian (W)	X	X	X				
Chalcedony (W)				X			
Other	3.1	.10	22.3	4.7			1.74

N = North
S = South
W = West

Also, these sites date 1-200 years earlier than the southern sites (Table 7). The southern sites correspond in age to the State Road Coulee Site, suggesting source preference to southern locations.

Ceramics

All of the ceramics recovered from the Oneota midden proveniences at the State Road Coulee site are shell-tempered sherds. A total of 125 of these are decorated. These were sorted by decoration attributes which allow comparison with other La Crosse and Oneota sites (Table 8). Stevenson et al. (1983) has observed apparent patterns in these assemblages suggesting differences between the Orr Phase and the Blue Earth Phase.

Two important ceramic characteristics indicate the State Road Coulee Oneota component represents an Orr Phase locality. These are the location of rim decoration, and the style of punctate/trail decorations. This assemblage includes 27 (79.4%) rims with decoration on the lip or edge. Five other rims have decoration slightly on the interior edge of the lip. The high frequency of lip or edge decoration has also been observed at the Orr Phase-Pammel Creek and Valley View sites. In contrast, extreme interior lip decoration dominates the rim assemblages from the Blue Earth Phase-Olsen, North Shore, and Jim Brown sites. The latter sites also have a preponderance of decorated sherds with punctates forming borders of trail zones. This is sharply contrasted at the State Road Coulee site where no such sherds were recovered, and at the Valley View and Pammel Creek sites. Furthermore, 80% of the punctated sherds at 47Lc176 are arranged so as to fill zones created by triangular chevrons. This is a relatively common motif at Orr Phase sites such as Valley View, and is rare at the Blue Earth Phase sites.

Examples of some of the Oneota decorative styles recovered from the State Road Coulee sites are presented in Figures 17-20. Two rather uncommon motifs were observed. A neck sherd with horizontal rows of punctates bordered by parallel tool trails was recovered from the re-excavation of Bank Cut #1. This is the second example of this motif recovered from this cut (see Boszhardt and Gallagher 1983:22). Only a few other examples of this style known from La Crosse. These include a rim section from the Pammel Creek site and another rim from the Sand Lake site (R. Sasso personal communication). These rims compare strongly to reported Lake Winnebago Trilled vessels (McKern 1945) and vessels from the Karow site at the University of Wisconsin-Oshkosh (Durst personal communication). Other body sherds are known from the Pammel Creek site (Boszhardt et al. 1984b:46), and the Bird Bluff site (47Lc158; R. Boszhardt et al. 1984b:103).

Grit-tempered Woodland ceramic sherds were recovered from two proveniences at the 47Lc176 midden area. In both instances these were stratigraphically beneath the Oneota midden. Several rim decorated sherds were recovered from redeposited stream deposits at Bank cut 0 in Project Area II, and a few undecorated sherds were found in-situ in Level 11 of the 2x2 meter control unit (Test Pit #1). The latter may have been associated with a Woodland feature.

TABLE: 7

Radiocarbon Dates Available for La Crosse Area Oneota Sites

<u>Site</u>	<u>Date (A.D.)</u>	<u>Laboratory</u>
Overhead (47Lc20)	1485 $\pm$ 55 1510 $\pm$ 65	Wis 601 Wis 573
Midway (47Lc19)	1420 $\pm$ 70 1630 $\pm$ 60	Wis 61 Wis 79
Pammel Creek (47Lc61)	1430 $\pm$ 70 1440 $\pm$ 70 1470 $\pm$ 70 1520 $\pm$ 70	Wis 1522 Wis 1525 Wis 1523 Wis 1524
Sand Lake (47Lc44)	1450 $\pm$ 70 1460 $\pm$ 70 1480 $\pm$ 90 1650 (modern)	wis 1479 wis 1480 wis 1477 Wis 1478
Valley View (47Lc34)	1020 $\pm$ 40 1195 $\pm$ 75 1550 $\pm$ 70 1600 $\pm$ 70	Beta 1676 Beta 1677 Wis 1630 Wis 1666
State Road Coulee (47Lc176)	1550 $\pm$ 60 (corn) 1530 $\pm$ 70 (charcoal)	Wis 1584 Wis 1617
North Shore (47Lc185)	1340 $\pm$ 70	Wis 1629
Olson (47Lc76)	1390 $\pm$ 70	Wis 1631

Table 8: Comparison of Oneota Ceramic Attributes from La Crosse Area Oneota Sites

	Olsen (47Lc61)	North Shore (47Lc185)	Jim Braun (47Lc59)	State Road (47Lc176)	Valley View (47Lc34)	Pammel Creek (47Lc61)
	#	#	#	#	#	#
	%	%	%	%	%	%
Rim Treatment						
Plain	1	1	8	2	7	0
Lip or Edge	6	3	8	27	249	27
Interior	197	20	67	5	8	9
Exterior	0	0	1	0	2	8
	.01	4.16	9.5	5.8	2.6	0
	2.9	12.5	9.5	79.4	93.6	61.3
	96.5	83.3	79.8	14.7	3.0	20.5
	0	0	1.2	0	0.8	18.2
Total	204	24	84	34	266	44
	99.5	99.96	100.0	100.0	100.0	100.0
Handles						
Loop	0	0	2	3	3	4
Strap	10	0	10	10	73	9
	100	0	83.3	76.9	96.1	30.8
Total	10	0	12	13	76	13
	100	0	100.0	100.0	100.0	100.0
Shoulder Decoration						
Plain	0	0	0	0	4	0
Finger Trail	5	0	12	8	75	16
Tool Trail	1098	74	222	84	829	137
Punctates	283	4	34	10	82	13
	20.4	4.46	12.7	9.8	8.3	7.8
Total	1380	79	268	102	990	166
	99.0	70.46	100.0	100.0	100.0	100.0
Punctates and Trails						
Bordering Trail						
Zones	193	13	31	0	3	1
Filling Zones	0	1	2	8	25	0
Rows Outlined						
by Trails	X	0	0	1	0	3
?		0	1	1	54	9
		0	1.9	10	65.9	23.0
Total	194	14	34	10	82	13
	100	99.99	99.0	100.0	99.5	99.8

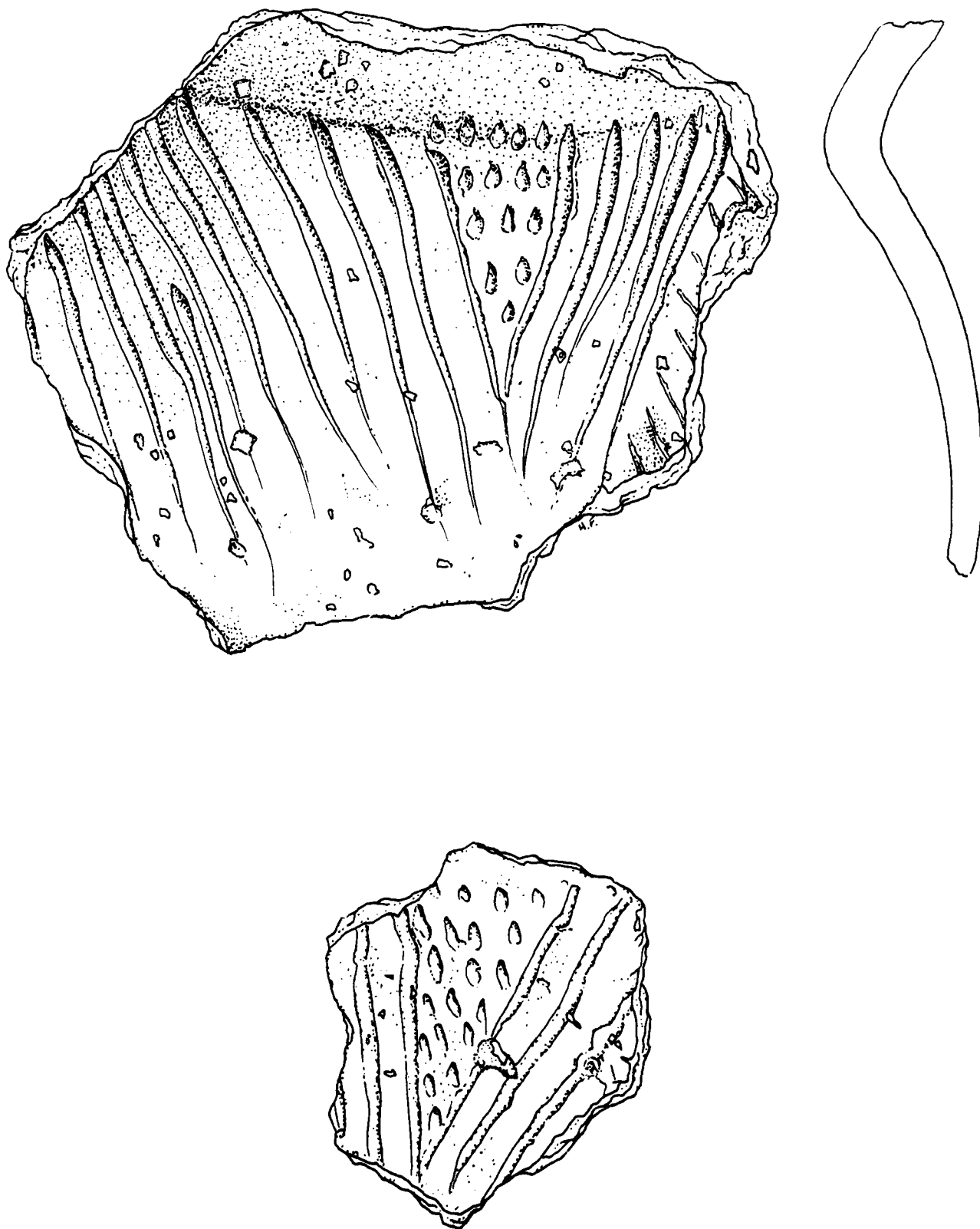


Figure 17 - ONEOTA ceramics 47LC176 (punctates filling zones).

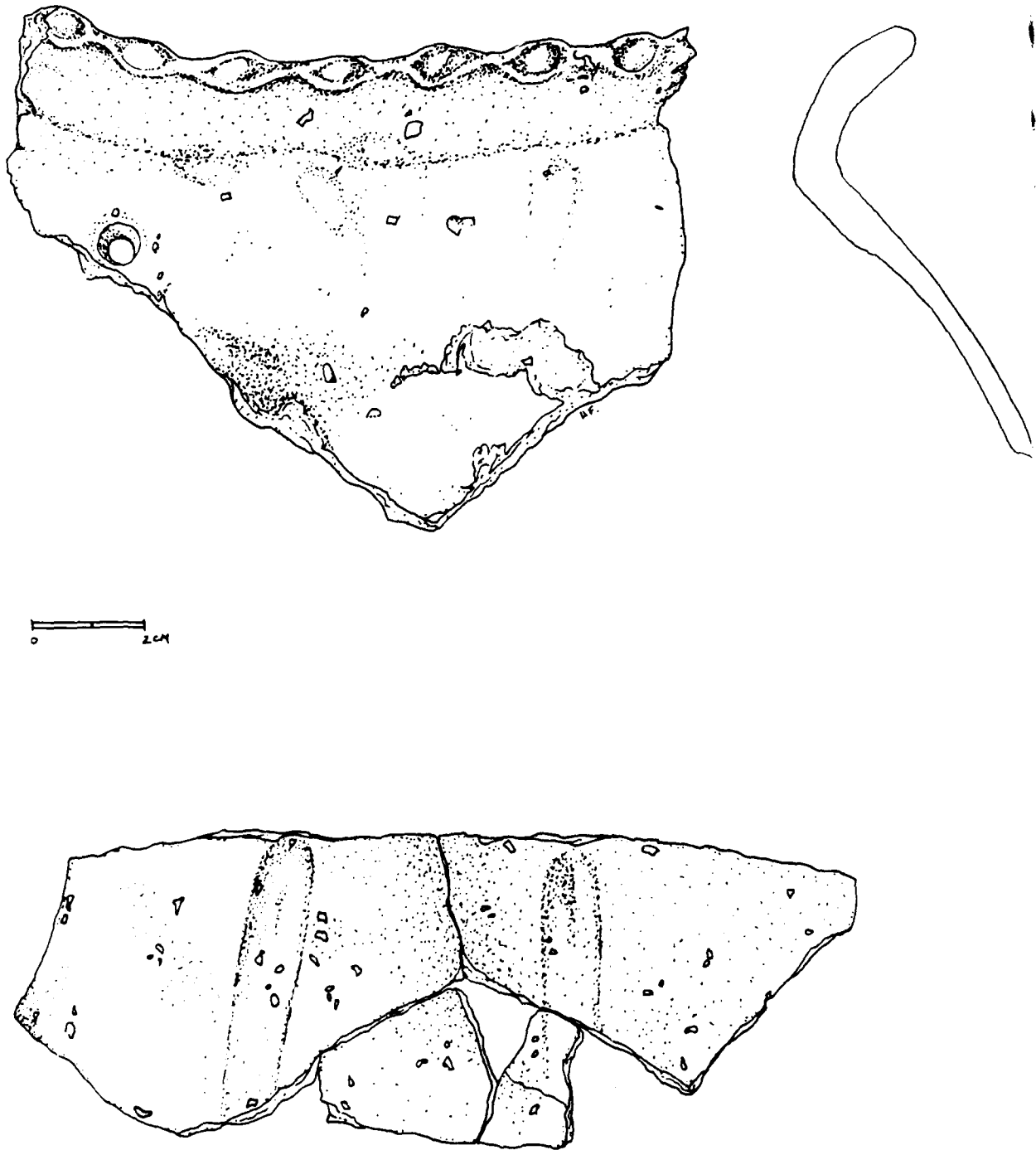


Figure 18- ONEOTA ceramics 47LC176 (finger trails).

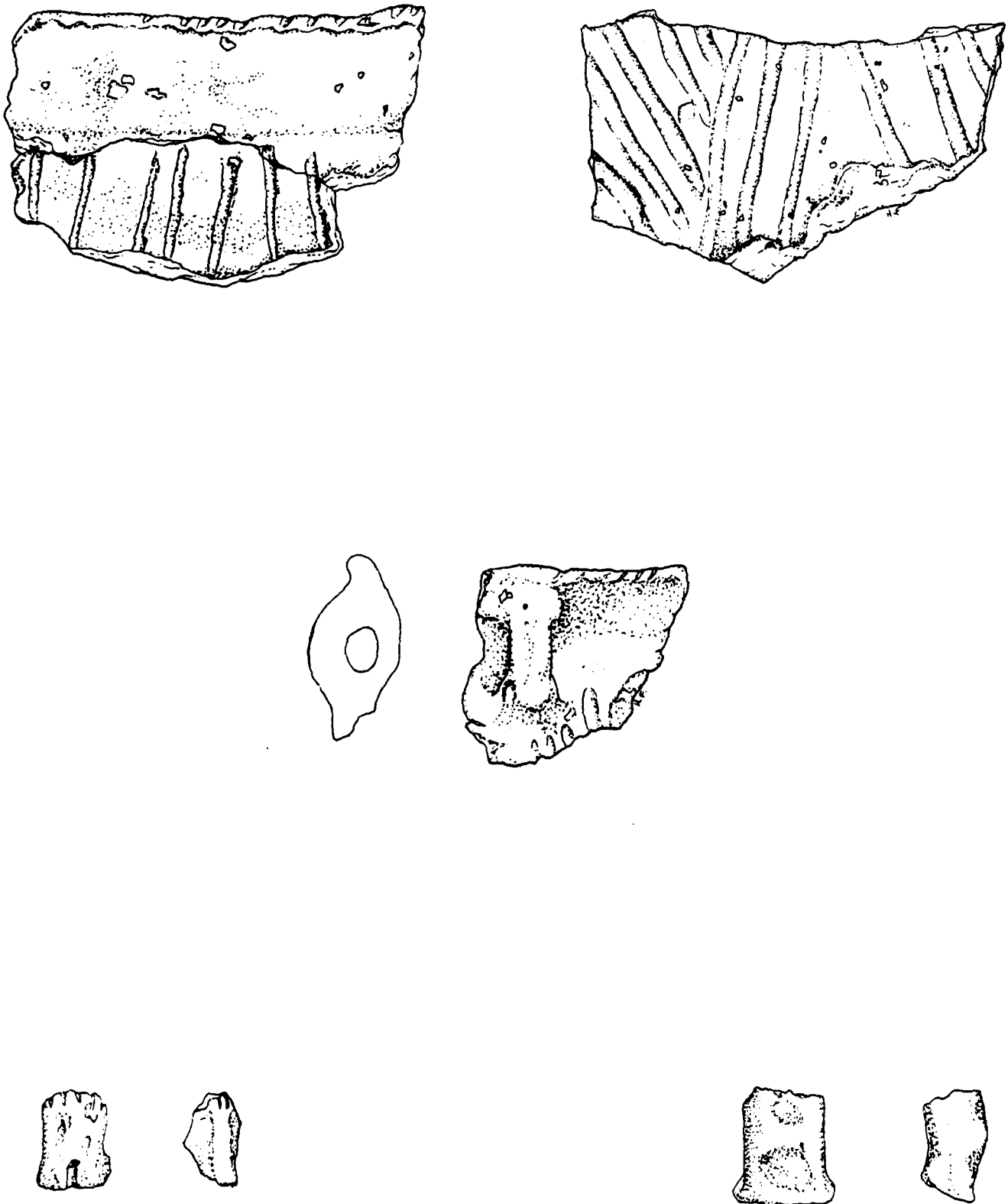


Figure 19- ONEOTA ceramics 47LC176 (tool trails and handles).

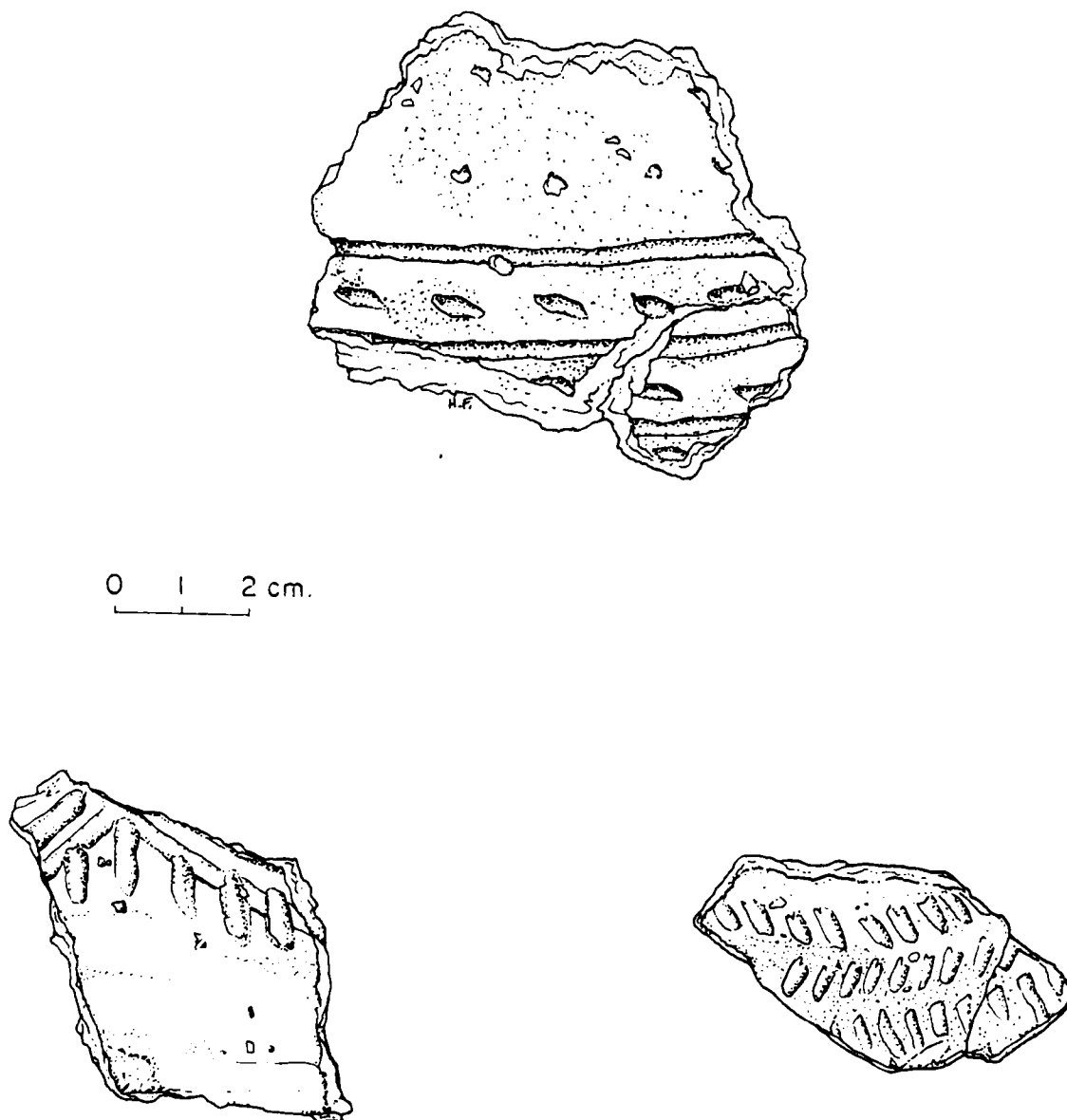


Figure 20- ONEOTA ceramics 47LC17b (miscellaneous).

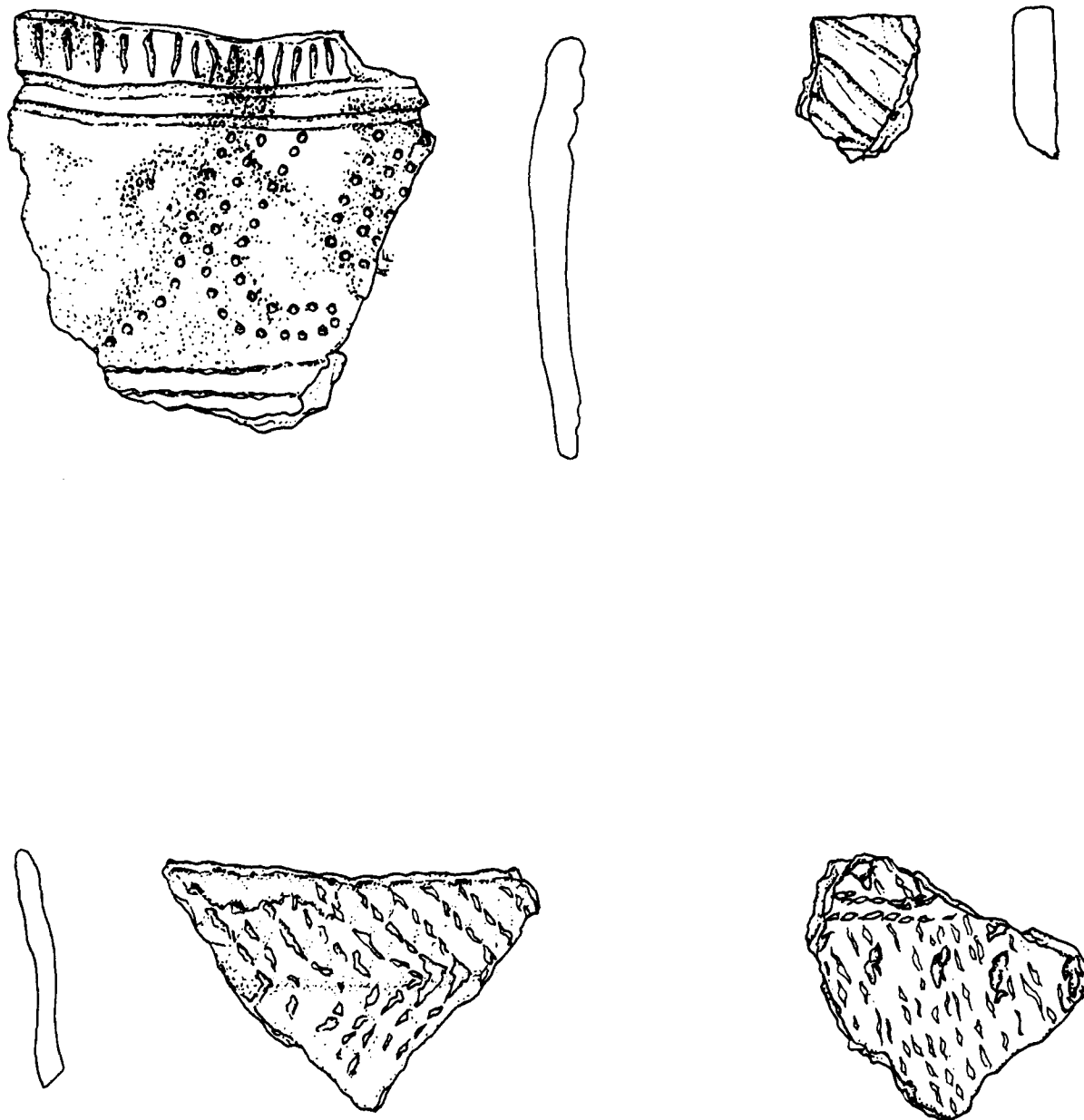


Figure 21 - Redeposited WOODLAND ceramics (Bank cut O) 47LC176.

Only the decorated sherds from Bank Cut 1 are useful for temporal, cultural affiliation inferences. Those include a Levsen Punctated rim (Fig. 21). These sherds, especially the Levsen Punctated rim, suggest late Middle Woodland affiliation as represented by Linn Ware (Benn 1979). Linn Ware is associated with the Millville Phase in southwestern Wisconsin (Stoltman 1979) and the Allamakee Phase in northeast Iowa (Benn 1979). Radiocarbon assay of samples suggest that these phases date from A.D. 400-700 with some question of the beginning age.

As mentioned earlier, the Linn ware ceramics from Bank Cut 1 (Project Area II) were in redeposited contexts. The Woodland sherds from Level 11 of Test Pit 1, are too incomplete to identify cultural affiliation. Therefore, the age of the in-situ Woodland remains at 47Lc176 remains poorly understood.

Sand Rise

Phase II investigations of the sandy rise to the west of the Oneota midden at 47Lc176 were undertaken in order to evaluate the nature and condition of scant cultural remains recovered on the rise in 1983, and to determine the relationship of these to the Oneota midden. These were investigated by excavating a 2x2 meter unit (Test Pit 2) at the location of 1983 Bank Cut 10 where a few flakes were recovered in an apparent remnant Natural A Horizon. In addition, shovel test transects to the east, south, and southwest from Test Pit 2 were excavated, and geomorphological coring was conducted to determine the extent of the cultural remains and the sand rise. Finally, a series of backhoe trenches exposed its west edge and a low buried surface. The locations of the excavations is shown on Fig. 7.

These efforts resulted in the recovery of only a few artifacts. Test Pit #2 documented a remnant Natural A Horizon which contained a few prehistoric remains (see Table 9). The north half of this unit, nearer the creek, was also found to have slumped at some time in the past. No indication of significant features or stratigraphic horizons were located in this unit or in any of the other excavations.

The cultural materials from Test Pit 2 were restricted to the Natural A Horizon of which approximately 50cm remained. Based on the depth of undisturbed Natural A Horizons at sandy soil areas at La Crosse, it is likely that approximately 50cm of the original Natural A Horizon had been scraped away.

The ceramics include 10 grit-tempered (Woodland) and 4 shell-tempered (Oneota) sherds. These are all small and of little use for more precise cultural affiliation information. However, the presence of both Woodland and Oneota sherds indicates that the rise was the location of prehistoric activity by at least two groups. The Woodland activities may relate to those indicated by Woodland sherds in Level 11 of Test Pit 1, and the redeposited late Middle Woodland sherds at Bank Cut 0 (Project Area II). The Oneota sherds are likely the remains of the same group which created the midden at Drive-In Road bridge.

Table 9: Cultural Materials recovered from Test Pit 2 (Sandy Rise)

All Levels

1 projectile point
1 tertiary flake
5 chips
2 chunks
10 undecorated shell-tempered sherds
4 undecorated grit-tempered sherds
8 faunal
1 floral
1 historic
2 fire-cracked rock (limestone)

Shovel testing indicated that the remnant A horizon extends sporadically 90 m east of T.P. 2, and 15 m S and 10 m SW. The shovel test holes and backhoe trenches C and D revealed that the sandy rise had been scraped, which has removed the Natural A Horizon to the south of Test Pit #2. Only a very few undiagnostic prehistoric artifacts were recovered from the shovel holes and backhoe trenches on the sandy rise.

The terrace edges of the sand rise were clearly defined by tracing the buried slopes with the coring rig (see Appendix A). This geomorphological feature is shown on a figure within that appendix.

To the southwest of the sand rise, the original pre-settlement surface was found to dip sharply and be deeply buried (see Appendix A). This is the area where bank cutting in 1983 failed to reach beneath the historic alluvium. The prehistoric surface was found to be approximately 2-2.5m beneath the present surface. Investigation of the buried prehistoric surface was accomplished through the excavation of two backhoe trenches (A + D; see Figure 7). These began at the edge of the sand rise and followed its terrace edge down to expose the surface of the buried horizon. This surface was skim shoveled to inspect for cultural materials and possible features.

The buried surface consists of a dark brown (10YR3/2) fine sandy loam. The surface appeared not to be ridged. Prehistoric materials including a few small shell-tempered sherds, flakes, fire-cracked rock, and charcoal were found widely scattered in the backhoe trench exposures. This area is interpreted as containing undisturbed Oneota materials. The activities which occurred at this side of the sand rise are likely related to the Oneota midden at Drive-In Road.

FAUNAL REMAINS: 47LC176

By: James L. Theler

A small quantity of vertebrate and invertebrate faunal material was recovered during the Phase II excavations at 47LC176. In Table 10 the distribution of taxa by level is presented for the control unit. Table 11 lists the taxa recovered from 7 site proveniences (exclusive of the control unit) having moderate densities of faunal material. Twelve additional proveniences that produced low densities of faunal material are listed separately in Table 12. Finally, a site list of elements by species/genus is presented in Table 13.

Mollusca: In all, 11 valves of 5 freshwater mussel (naiad) species were recovered from Lc176. Seven valves of one species, the ebony shell (Fusconaia ebena), represent a minimum of 5 individuals. Fusconaia ebena is a taxon characteristic of larger rivers having a moderate to high velocity current over a mixed sand and gravel or stable sand substrate. Individuals of this species were almost certainly obtained from a side or main channel of the Mississippi River to the west of Lc176. The other 4 mussel species found at the site require some current and a stable substrate, and were possibly collected in the main stem Mississippi.

Turtles: At least 4 turtle taxa are represented in the Lc176 assemblage. Twenty-five carapace/plastron fragments assignable to the softshell turtle, Trionyx sp., were recovered from various proveniences at the site. Two species of Trionyx, T. s. spiniferus and T. m. muticus are known to have occurred in La Crosse County in historic times (Vogt 1981). Neither of these species inhabits temporary ponds or marshes, and both taxa prefer well oxygenated streams with current and a sand substrate. Trionyx was possibly procured by the aboriginal inhabitants of Lc176 in the Mississippi or one of its side channels. Thirteen of the 25 Trionyx shell fragments are burnt, perhaps indicating the ethnographically known culinary practice where turtles are placed on hot coals to be baked in the shell.

Other turtle taxa at Lc176 include a map turtle (Graptemys geographic) represented by one nuchal bone of the carapace. The map turtle prefers backwater environments such as sloughs or oxbow lakes, but is occasionally encountered in marsh habitats. A Blanding's turtle (Emydoides blandingi) is represented by a nuchal bone. The Blanding's turtle prefers open, grassy marsh habitats and mesic prairies, and may have been taken in the vicinity of the site. The snapping turtle (Chelyra serpentina) is represented by 9 elements, 8 carapace/plastron sections and 1 proximal humerus. C. serpentina is to be encountered in a broad range of habitat settings, but appears to prefer low energy aquatic environments with dense aquatic vegetation over a mud substrate (Vogt 1982).

Fishes: Six fish taxa were identified in the Lc176 assemblage. Five of these taxa, including the gar (Lepisosteus sp.), bowfin (Amia calva), pike

(Esox sp.), catfish (Ictalurus sp.) and black bass (Micropterus sp.) are all taxa most commonly found in permanent backwater habitats (Becker 1983). One additional species, the freshwater drum (Aplodinotus grunniens), is represented by 2 elements. The drum fish is characteristic of streams having a low to moderate current velocity, and was probably obtained from the Mississippi River.

Birds: Two bird taxa were identified at Lc176. A distal humerus is attributable to a mallard (Anas platyrhynchos) or a black duck (Anas rubripes). Both taxa pass along the Mississippi trench during their annual spring and fall migrations and are known to nest in small numbers in the upper Mississippi River valley (Bellrose 1976). The proximal shaft of the Anas humerus bears distinct punctures indicating the element has been chewed by a carnivore.

A wild turkey (Meleagris gallopavo) is represented by a carpometacarpus. The surface texture of this specimen indicates it has been ingested by a carnivore, perhaps a canid. The La Crosse area is located on the northern boundary of the wild turkey's historically known range (Schorger 1966:43-44). Certain aspects of severe winter weather (e.g., crusted snow) appear to control the northern range of the turkey. Turkey remains are relatively uncommon at archaeological sites in the La Crosse County region.

Mammals: Ten mammal taxa are represented in the Lc176 assemblage. Two of these, the short-tailed shrew (Blarina brevicauda) and a vole (Microtus sp.) are not considered to be food sources for the site's inhabitants. The most numerous specifically identified mammalian remains were those of the beaver (Castor canadensis) with 38 bones representing at least two individuals. The largest number of beaver remains occurred at the west edge of the midden, where 25 bones were recovered, 23 of these are cranial fragments or teeth, all possibly from the same individual. The beaver occurs in both lakes and streams in wooded areas.

Six elements assignable to the muskrat (Ondatra zibethicus) are present in the assemblage. This taxon is a common riparian animal and often occurs in large numbers in shallow marshes.

The white-tailed deer (Odocoileus virginianus) is represented by 11 bones of at least one individual. All of these, with the exception of one ischium fragment, are cranial/entition or lower limb bones. Although the sample size is small, this element distribution may indicate off-site processing of deer that involved deboning or abandoning selected portions of the carcass.

In addition to a scapula hoe, bison (Bison bison) is probably represented by a 3rd phalanx. A lateral malleolus from the control unit is attributable to either bison or elk (Cervus canadensis).

DISCUSSION

It is clear that some, if not most of the fauna recovered at Lc176 was harvested from an environment different than the local setting as described in this report from the GLO Survey records and the writing of Lewis Pammel (see also Boszhardt and Gallagher, 1983). The freshwater mussel (Fusconaia ebena), the softshell turtle and the drum fish were almost certainly procured in the Mississippi River or one of its side channels. The backwater environments of the Mississippi or other nearby streams are the probable sources of the beaver, 5 fish taxa and perhaps two additional turtle species. The marsh in the vicinity of Lc176 may have supported a population of muskrats and perhaps Blanding's turtles. The raccoon and snapping turtle frequent a wide range of habitats and may have been procured near the site, or more probably in the backwater area of the Mississippi. The turkey and white-tailed deer may have been hunted in the uplands east of Lc176, although a procurement in the backwater area along the Mississippi is certainly possible.

Table 10: Distribution of Faunal Remains in the Control Unit at 47Lc176

<u>TAXA</u>	<u>L-1</u>	<u>L-2</u>	<u>L-3</u>	<u>L-4</u>	<u>L-5</u>	<u>L-6</u>	<u>L-7</u>	<u>L-8</u>	<u>L-9</u>	<u>L-10</u>
Mollusca										
Naiades										
(freshwater mussel)	-	-	-	-	4	2	-	-	-	-
Reptiles: Turtles										
<u>Trionyx</u> sp.										
(softshell)	-	1	-	3	6	1	1	2	-	-
Unidentifiable	2	1	-	17	9	1	-	-	-	-
Fishes										
<u>Lepisosteus</u> sp.										
(gar)	-	-	-	-	2	-	-	-	-	-
<u>Micropterus</u> sp.										
(black bass)	-	-	-	-	-	-	1	-	-	-
<u>Aplodinotus grunniens</u>										
(drum fish)	-	-	-	-	-	-	1	-	-	-
Unidentifiable fish	1	1	-	6	14	9	2	-	26	-
Birds										
Unidentifiable birds	-	1	-	-	5	-	-	-	1	-
Mammals										
<u>Castor Canadensis</u>										
(beaver)	-	-	-	4	2	-	-	-	-	1
<u>Ondatra zibethicus</u>										
(muskrat)	-	-	-	-	1	1	-	1	-	-
<u>Canis</u> sp.										
(coyote/dog)	-	-	-	1	-	1	-	-	-	-
<u>Odocoileus virginianus</u>										
(white-tailed deer)	-	-	1	2	1	-	-	-	2	-
<u>Bison bison</u> or <u>Cervus</u>	1	-	-	-	-	-	-	-	-	-
<u>Canadensis</u>										
(American bison or elk)										
Unidentifiable mammal										
bone	9	48	-	83	103	56	11	7	-	6
Bone unidentifiable										
to class	4	-	-	35	13	2	1	-	-	-

Table 11: Distribution of Faunal Remains from Selected Proveniences of 47Lcl76

TAXA	Bank Gully #1	Bank Gully #2	West Edge Midden	Bank Cut O/A	Bank Cut O	Test Pit #3 Level 2	Core #1 91-155cm
MOLLUSCA: Naiades (Freshwater mussels)							
<u>Amblema p. plicata</u> (Say, 1817) (three-ridge)	0	0	0	1	0	0	1
<u>Fusconaia ebena</u> (Lea, 1831) (ebony shell)	1	1	2	2	0	0	0
<u>Fusconaia flava</u> (Rafinesque, 1820) (pig-toe)	0	0	0	1	0	0	0
<u>Potamilus alatus</u> (Say, 1817) (pink heel splitter)	0	0	0	1	0	0	0
<u>Pleurobema sintoxia</u> (Rafinesque, 1820) (pig-toe)	0	0	0	0	1	0	0
Unidentifiable valves	1	0	4	1	0	0	0
FISHES							
<u>Lepisosteus</u> sp. (gar)	0	0	5	0	0	1	1
<u>Amia calva</u> (bow fin)	2	0	1	1	0	0	0
<u>Esox</u> sp. (pike)	1	0	0	0	0	0	0
<u>Ictalurus</u> sp. (catfish)	1	1	3	2	0	0	2
<u>Micropterus</u> sp. (black bass)	0	0	1	0	0	0	0
<u>Aplodinotus grunniens</u> (freshwater drum)	1	0	0	0	0	0	0
Unidentifiable fish bones	49	15	145	1	1	3	19
REPTILES							
Turtles							
<u>Chelydia serpentina</u> (snapping)	1	2	5	0	0	0	1
<u>Graptemys geographica</u> (map)	0	1	0	0	0	0	0
<u>Graptemys/chrysemys</u>	0	0	1	0	0	0	0
<u>Emydoidea blandingi</u> (Blandings)	0	0	0	0	1	0	0
<u>Trionyx</u> sp. (softshell)	0	0	5	4	0	1	0
Unidentifiable turtle bones	6	3	17	2	2	4	0
Snakes							
<u>Colubridae</u> (non-poisonous)	0	0	2	0	0	0	0
AMPHIBIANS							
<u>Rana</u> sp. (frog)	0	0	1	0	0	0	0
BIRDS							
<u>Anas platyrhynchos</u> or <u>A. rubripes</u> (mallard or black duck)	0	1	0	0	0	0	0
<u>Meleagris gallopavo</u> (wild turkey)	0	0	1	0	0	0	0
Unidentifiable bird bones	1	0	20	5	0	0	1

Table 11: Distribution of Faunal Remains from Selected Proveniences of 47Lc176 (cont'd)

	Bank Gully #1	Bank Gully #2	West Edge Midden	Bank Cut O/A	Bank Cut O	Test Pit #3 Level 2	Core #1 91-155cm
MAMMALS							
<u>Elarina brevicauda</u> (short-tailed shrew)	0	0	1	0	0	0	0
<u>Microtus</u> sp.	0	6	2	0	0	0	0
<u>Sylvilagus floridanus</u> (Eastern cotton tail)	0	0	0	1	0	0	0
<u>Castor canadensis</u> (beaver)	3	1	25	2	0	0	0
<u>Ondatra zibethicus</u> (muskrat)	2	0	0	1	0	0	0
<u>Canis</u> sp.	0	0	0	2	0	0	0
<u>Procyon lotor</u> (raccoon)	0	0	1	0	0	0	0
<u>Odocoileus virginianus</u> (white-tailed deer)	0	0	3	3	0	0	0
<u>Bison bison</u> or <u>Cervus canadensis</u> (American bison or elk)	-	-	-	-	-	-	-
Unidentifiable mammal bones	79	8	240	48	4	5	2
Bone Unidentifiable to Class	2	3	1	0	0	0	0

Table 12: Proveniences Producing a Low Density of Faunal Material

1983 BANK CUT
 6 unidentifiable mammal bones
 1 *Pleurobema sintoxia*

1983 BANK CUT, RIDGE #1
 5 unidentifiable mammal bones
 2 unidentifiable mussel valves

SHOVEL TEST #1
 1 unidentifiable mammal bone
 1 bone unidentifiable to class

BACKHOE TRENCH A
 7 unidentifiable mammal bones

BACKHOE TRENCH C
 3 unidentifiable mussel valves

CONTROL UNIT - ZONE B
 3 unidentifiable mammal bones
 3 unidentifiable bird bones
 1 unidentifiable fish bone
 1 bone unidentifiable to class

CONTROL UNIT 5 x 5 RIDGE TRENCH
 2 unidentifiable mammal bones

TEST PIT 2, LEVEL 4, AREA B
 1 unidentifiable mussel valve

CORE 27, 20 CM
 1 unidentifiable bird bone
 1 unidentifiable mammal bone

CORE 27, SAND
 1 *Sylvilagus floridanus* unsided incisor
 1 unidentifiable mammal bone

CORE 1
 3 unidentifiable fish bones
 1 unidentifiable turtle bone
 1 unidentifiable mammal bone
 3 bones unidentifiable to class

BANK OF HISTORIC UNIT, AREA B (5 x 5 M UNIT)
 4 unidentifiable mammal bones
 1 *Trionyx* sp. carapace/plastron fragment
 60 unidentifiable mammal bones

Table 13MAMMALS

(B)= burnt bone

Blarina brevicauda

- 1 L mandible, west edge of midden

Microtus sp.

- 1 L ; 1 R mandible, west edge of midden

Sylvilagus floridanus

- 1 R, anterior incisor, Bank Cut O/A
- 1 unsided incisor fragment, Core 27 Sand

Castor canadensis

- 1 R, mandible w/M3, M2, M1, P4, minus incisor, Bank Cut O/A
- 1 unsided incisor fragment (B), Bank Cut O/A
- 1 Ax. occipital, Bank Gully 1
- 1 unsided incisor fragment, Bank Gully 1
- 1 L innominate, Bank Gully 1
- 1 L astragulas (B), Bank gully 2
- 1 L maxilla fragment w/M3, M2, M1, P4, west edge of midden
- 3 R teeth, cf. lower M3, M2, P4, west edge of midden
- 1 L distal tibia, west edge of midden
- 1 L; 1 R zygomatic, west edge of midden
- 1 ax. caudal vertebrae, west edge of midden
- 1 R upper incisor fragment, west edge of midden
- 1 L; 1 R zygomatic process, west edge of midden
- 14 unsided cranial fragments, west edge of midden
- 1 L mandible w/M3, M2, M3, P4, control unit, L-4
- 1 ax. axis vertebrae, control unit, L-4
- 1 unsided incisor fragment, control unit, L-4
- 1 L distal tibia, control unit, L-4
- 1 unsided incisor fragment, control unit, L-5
- 1 unsided molar, control unit, L-5
- 1 L nasal, control unit, L-10

Ondatra zibethicus

- 1 R mandible w/fragment of I, Bank Cut O/A
- 1 L scapula fragment, Bank Gully 1
- 1 R innominate fragment, Bank Gully 1
- 1 L M1, control unit, L-5
- 1 L mandible w/M1, I, control unit, L-8
- 1 L M2, control unit, L-6

Canid

- 1 R M1, Bank Cut O/A
- 1 unsided phaxanx fragment, Bank Cut O/A
- 1 unsided premolar, control unit, L-4
- 1 R P4 in maxilla fragment, control unit, L-6

Procyon lotor

- 1 L maxilla w/M3, P2, west edge of midden

Odocoileus virginianus

- 1 L (?) dropped antler base and beam fragment, west edge of midden
- 1 L molar, west edge of midden
- 1 R ischium at acetabulum, Bank Cut O/A
- 1 R astragalus, Bank Cut O/A
- 1 R deciduous M₁, Bank Cut O/A
- 1 L upper M₁ or M₂, control unit, L-3
- 1 unsided proximal 3rd phalanx (B), control unit, L-4
- 1 L deciduous M₁, control unit, L-5
- 1 unsided proximal 1st phalanx, control unit, L-9
- 1 unsided sesimoid, control unit, L-9

Bison bison or Cervus canadensis

- 1 L lateral malleolus, control unit, L-1

cf. Bison bison

- 1 unsided 3rd phalanx, west edge of midden

BIRDSAnas cf. platyrhynchos or rubripes

- 1 L distal-medial humerus, Bank Gully 2
- specimen has punctures suggestive of carnivore chewing

Meleagris gallopavo

- 1 L carpometacarpus, west edge of midden
- appears to have been ingested by a canid (?)

AMPHIBIANS AND REPTILESRana sp.

- 1 L illium, west edge of midden

Colubridae

- 2 ax. vertebrae, west edge of midden

Chelydra serpentina

- 1 R proximal humerus, Bank Gully 1
- 2 unsided carapace/plastron fragments, Bank Gully 1
- 5 unsided carapace/pastron fragments, west edge of midden
- 1 unsided marginal of carapace, core #1 91-155cm

Emydoidea blandingi

- 1 ax. nuchal, Cut Bank #0

Graptemys geographica

- 1 ax. nuchal, Bank Gully 2

Chrysemys/Graptemys group

- 1 ax. nuchal, west edge of midden

Trionyx sp.

- 4 unsided carapace/plastron fragments, Bank Cut O/A
- 5 unsided carapace/plastron fragments (4B), west edge of midden
- 1 unsided carapace/plastron fragment, 5x5m unit, historic area B
- 1 unsided carapace/plastron fragment (B), Test pit #3, L-2
- 1 unsided carapace/plastron fragment (B), control unit, L-2
- 3 unsided carapace/plastron fragments (2B), control unit, L-4
- 6 unsided carapace/plastron fragments (2B), control unit, L-5
- 1 unsided carapace/plastron fragment (B), control unit, L-6
- 1 unsided carapace/plastron fragment (B), control unit, L-7
- 2 unsided carapace/plastron fragments (1B), control unit, L-8

FISHESLepisosteus sp.

- 1 unsided cranial fragment, west edge of midden
- 4 scales (1-B), west edge of midden
- 1 scale, Test pit 3, L-2
- 1 scale, core #1, 91-155cm
- 1 scale, Control Unit, L-5
- 1 unsided cranial fragment, Control Unit, L-5

Amia calva

- 1 L opercle, west edge of midden
- 1 R dentary, Bank Cut O/A
- 2 unsided cranial fragments, Bank Gully 1

Esox sp.

- 1 R cleithrum, Bank Gully 1 (est. live wt. 2 lbs.)

Ictalurus cf. punctatus

- 1 L opercle, Bank Gully 1 (est. live wt. 3 lbs.)

Ictalurus sp.

- 1 L, 1 R cleithrum, west edge of midden
- 1 unsided pectoral spine fragment (B), west edge of midden
- 1 unsided supracleithrum, Bank Gully 2
- 1 R dentary, Bank Cut O/A
- 1 unsided pectoral spine fragment, Bank Cut O/A
- 1 L hyomandibular, core 1, 91-155cm
- 1 R articular core 1, 91-155cm

Micropterus sp.

- 1 R hyomandibular, west edge of midden (est. live wt. 4-5 lbs.)
- 1 L dentary (B), Control Unit, L-7

Aplocheilichthys grunniens

- 1 ax. anal spine, Bank Gully 1
- 1 molar-form arch tooth, Control Unit, L-7

NAIADESAmblema p. plicata

1 R valve, Bank Cut O/A

Fusconaia ebena

2 R valves, Bank Cut O/A

2 R valves, west edge of midden

1 R valve, Bank Gully 1

1 L valve, Bank Gully 2

1 L valve, Control Unit, L-6

Fusconaia flava

1 L valve, Bank Cut O/A

Pleurobema sintoxia

1 R valve, Bank Cut O

Potamalus alatus

1 L valve, Bank Cut O/A

BONE TOOLSBison bison

1 L glenoid and neck of scapula hoe, Bank Gully

Bison bison or Cervus canadensis

1 unsided modified scapula fragment, Bank Gully 1

cf. Odocoileus virginianus

1 unsided antler tine, Bank Gully 1, tine was removed from a beam by the grooved and snapped technique

STATE ROAD COULEE FLORAL ANALYSIS

BY: THOMAS W. BAILEY

Floral remains were recovered during Phase II investigations of 47Lc176, which included on-site water screening and laboratory flotation. Microscopic sorting was undertaken at the laboratory of the Mississippi Valley Archaeology Center. Identification was conducted by the author. Identified remains were also examined by Leonard Blake of the Washington University (St. Louis) (see Appendix B).

Detailed analysis was undertaken only for those remains recovered from the 2 x 2 meter control unit (Test Pit 1) and Bank Gullies 1 and 2. These proveniences represent samples from the Oneota midden.

An unusually high quantity of Eastern Eight Row variety corn (Zea Mays) remains were recovered. These consisted of nearly 2,000 kernels, of which all but one had been charred after removal from the cob. In addition, charred bean, nutshell, and wild seed were recovered.

Corn: Most of the corn was recovered from the 2 x 2 meter control unit, with the exception of one kernel which came from Test Pit 3. Corn was present in all levels of the control unit, with Levels 3-6 having the greatest quantities. Level 5 had the greatest concentration of corn with 1849 kernels and fragments (Table 14, Fig. 22). All of the corn kernels from the site, with the exception of one kernel, were charred after removal from the cob. Furthermore, the completeness of the kernels indicates that the corn was dried on the cob. In one instance several kernels had fused together during the charring process. The kernel which had charred while still on the cob was recovered from Zone B2 of the control unit.

Approximately 120 kernels were randomly selected and measured for width. These measurements ranged from 6.0 mm to 12.6 mm, with a width median of 9.1 mm. Sixty-five percent of the measured sample was within the range 8.5 - 9.9 mm. Twenty-five of the 120 measured corn kernels were also measured for height. These ranged from 4.7 - 8.5 mm, with a median of 6.7 mm. Sixty percent of the measured sample was within the range of 6.0 - 7.4 mm. The ratio of greater width than height is characteristic of Eastern Eight Row race corn ("Northern Flint") (Blake personal comm., see Appendix B).

These findings are confirmed by cupule and cob fragments recovered from Gully 1. One cupule indicates an Eight Row variety. A well preserved cob fragment (Fig. 22), measuring 5 cm long, is of the Ten Row variety of the Eastern Race.

Some evidence indicates that corn has been present in the Midwest since ca. 2,000 B.P. (Munson 1973), however, recent accelerator dating of "early" samples suggests that corn is a more recent arrival to this region (see appendix B). The Eastern Eight Row race requires a shorter growing season than earlier races to the south, and thus allowed corn agriculture to spread northward. By A.D. 1200 the Eastern Eight Row race dominated the agricultural complexes east of the Mississippi River (Cutler and Blake 1977).

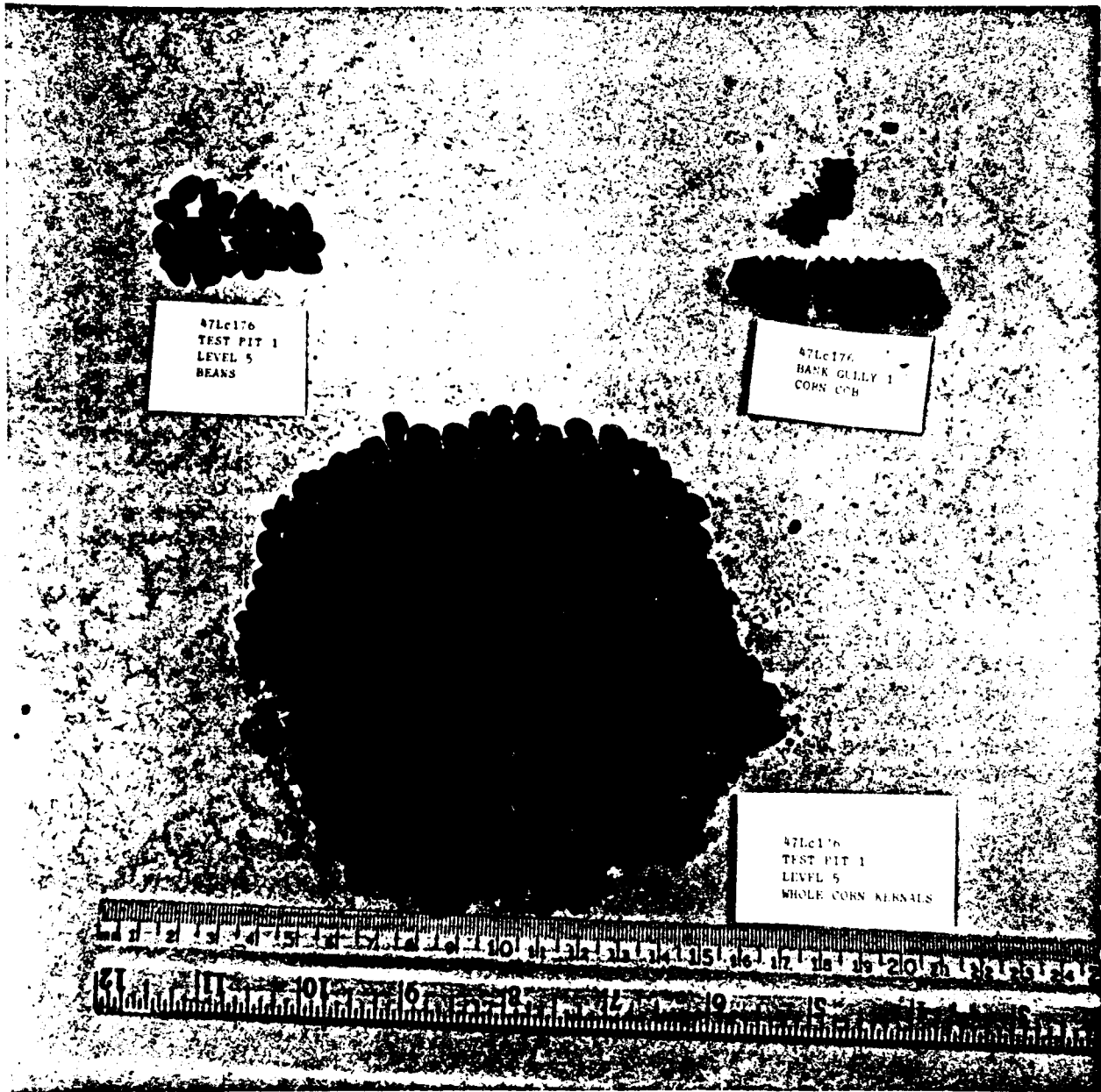


Figure 22—Cultigen remains 47LC176 ONEOTA midden.

All of the corn recovered from 47Lc176 is of the Eastern Eight Row race with the exception of one small cupule recovered from Level 6 of the control unit. The cupule represents a 12 rowed ear, identified as North American Pop (Blake personal communication, see Appendix A). This race is rarely represented at Upper Midwestern sites, although 12-rowed popcorn was recovered at the 18th century Marina Site at Lake Superior (Blake personal communication).

Bean: Most of the beans (Phaseolus vulgaris) at 47Lc176 were recovered from the control unit. Two beans each were recovered from Gullies 1 and 2. In the 2 x 2 meter control unit, beans were present in Levels 2, 3, 4, 5, 7, and 10. Level 5 had the greatest concentration of beans (see Table 14, and Fig. 21). Of the entire bean collection, only 8 were whole, and 29 were complete halves. Lengths ranged from 6.9 to 11.6 mm, with a median of 9.1 mm. Width ranged from 4.3 to 6.2 mm, with a median of 5.4 mm (Blake personal communication, see Appendix B). The ratio of length median to width median is 1.69. These measurements compare favorably to beans from other midwestern sites, most notably a contemporary Mississippian site in Missouri (23Mi71) (Blake personal communication, see Appendix B).

Bean first made its appearance in the Midwest approximately 1000 B.P. (Munson 1973). Although not a common remain at late prehistoric sites in the Upper Midwest, the presence of beans at the State Road Coulee Oneota midden is not surprising. Beans have been recovered at other La Crosse area Oneota sites including Sand Lake (47Lc44, see Boszhardt et al. 1984b), and Pammel Creek (47Lc61, see Boszhardt et al. 1984a).

Nutshell: The only identifiable nutshell recovered from 47Lc176 was that of Carya sp. Nutshell was found to be present in Core #1, Gully #1 and #2, and the 2 x 2 m control unit. Within the control unit, nutshell was recovered from Levels 1-7 and 10. In all cases, only small fragments were recovered. Levels 3-5 contained the greatest quantities of nutshell, although the most recovered from any one level was only 6 fragments. (See Tables 14 and 15). These low numbers may either reflect a lesser emphasis on gathering strategies, or methods for processing nutshell.

Seeds: A variety of charred seeds were recovered from the 2 x 2 m control unit. They include: Chenopodium sp. (lambs quarters), Portulaca sp. (purslane), Amaranthus sp. (pigweeds), Oxalis sp. (wood sorrel), and Ambrosia sp. (ragweeds). The greatest number of seeds were represented by Chenopodium sp. and Portulaca sp. (see Table 1). Charred seeds were recovered from Levels 3-7 and Level 10. The greatest concentration of charred seeds occurred in Levels 3-5. Unidentified charred seeds were recovered from level 3-5, 8, and 11. Modern seeds were recovered from Level 3-5, 8, and 11 of the Control Unit.

DISCUSSION

The floral assemblage from 47Lc176 is not unusual in species represented for La Crosse Area Oneota sites. In general, these indicate an economy

including cultivation of corn, beans, and squash, which was complimented by gathering of wild nuts and seeds including disturbed ground weed species present. However, the ratio of quantities of species remains at 47Lc176 is unique from analyzed local Oneota floral assemblages. The recovery of nearly 2,000 corn kernels and over 200 beans from one 2 x 2 meter unit is unprecedented. In contrast, the quantity of wild plant remains (especially nut shell) practices is miniscule.

Table 14: Floral Remains from Control Unit (47Lc176)

Level	Corn Kernel	Corn Cupule	Corn Cob	Corn Fragments	Nutshell	Chenopodium	Portulaca	Amaranthus	Oxalis	Bean	Ambrosia	Fungus	Modern Seed	Unidentified Seeds	Charcoal
1	1			1	1										*
2	31			60	2					10					*
3	120			50+	6	26	9			2		1	28	14	*
4	448			200+	5	25	75		1	47				3	*
5	1062			787	6	22		1		119	5		2	5	*
6	220	1	1	320	4	2	2	2					1		*
7	48			38	3	12	2		2	6					*
8				30+									1	2	*
9				20+											66
10				10+		1						3			*
11				10+						25				5	*

Zone	B	B1	B2	B3
Corn Kernel	9			trace
Corn Cupule				
Corn Cob				
Corn Fragments	14	7		
Nutshell	4			
Chenopodium	16	5	1	trace
Portulaca	15	25		
Amaranthus		2		
Oxalis	8	13		
Bean	2			
Ambrosia				
Fungus				
Modern Seed	8	4		
Unidentified Seeds	6			
Charcoal	*	*	*	*

* Denotes presence of charcoal

Table 15

	Corn Kernel	Corn Cupule	Corn Cob	Corn Fragments	Nutshell	Chenopodium	Portulaca	Amaranthus	Oxalis	Bean	Ambrosia	Fungus	Modern Seed	Unidentified Seeds	Charcoal
Test Pit #2														1	*
Test Pit #3, Level 2	1														*
Trench A				1		1	1								*
Core #1								2							*
Core #1a															68 *
Core #17															*
Gulley #1	5	3	1		1					2					*
Gulley #2	3				3					2			3		*
Bank Cut															*
Bank Cut 0/A															*
Bank Cut 0															*

* Denotes presence of charcoal

SUMMARY

Cultural resources investigations at Project Area I produced no direct evidence of cultural remains. However, the Phase I survey of this floodplain area was severely limited by deep historic sediments, and a high water table. The methodology of shovel testing to attempt to reach deep deposits was found to be unrealistic at this setting.

It is important to consider the possibility that undisturbed cultural deposits may exist beneath the water table at Project Area I. This possibility has been demonstrated in Navigation Pool 10 during studies sponsored by the St. Paul District Corps of Engineers. However, locating such resources involves costly remote sensing or deep coring. It is felt that these costly methods are not warranted for this specific project area. Rather, it is recommended that the construction of the stilling basin be monitored by a qualified archaeologist. If significant cultural resources are exposed and identified during the process, it is urged that the archaeologist be empowered with the capability to halt construction until an agreement of proper management can be negotiated between the St. Paul District Corps of Engineers and the State Historical Preservation Officer of Wisconsin.

Investigations of Project Area II resulted in the determination of the eastern edge of the 47Lc176 Oneota midden (30 meters east of Drive-In Road bridge). The significance and management recommendations of this area are presented below with the summary of Project Area III. Investigations at the upstream end of the flood control project near Hagen Road identified a raised sandy beach that appeared to be a likely location for prehistoric encampment; however, thorough survey by bank cuts and surface inspections failed to locate a single artifact. In addition, an apparently small isolated area containing Oneota materials was located 210 meters east of Drive-In Road bridge. This area has been designated the State Road Coulee II site (47Lc191).

Further investigations of 47Lc191 is recommended in order to determine its possible significance and relationship to 47Lc176. The recommended Phase II study of this site area will not be necessary if construction plans for the flood control project do not involve adverse impacts.

Phase II study of 47Lc176 at Project Area III produced information which has shown that the Oneota midden centering at Drive-In Road contains significant remains, and should be determined eligible for inclusion to the National Register of Historic Places. The site is known to extend 38 meters west of Drive-In Road and 30 meters to the east. Furthermore, the midden extends from Pammel Creek to Pammel Creek Road. The midden is sealed by 70-130cm of historic alluvium. Possible remains of prehistoric ridged fields were identified at the surface of the midden, although the nature of the midden precluded definite determination of ridge features. The midden deposits are nearly 1 meter thick, and overlie Woodland deposits. At places the Woodland materials including late Middle Woodland (Millville Phase) ceramics are situated in redeposited contexts. However, apparent in-situ Woodland deposits were also located to the west of Drive-In Road.

The Oneota materials include ceramics and lithics which suggest Orr Phase affiliation. Two radiocarbon samples from the midden place the age of the deposit during the first half of the 16th century A.D. This occupation is at the late end of the range of La Crosse area Oneota sites.

Internal artifact distribution varied both horizontally and vertically within the midden. Of ten arbitrary levels excavated through the Oneota deposit, Level 5 produced the greatest quantity of artifacts. Quantities of materials decreased both above and below this level, although the types of materials remained constant. However, the type and size of artifacts differed from Test Pit 1 to the west edge of the midden. The materials of Test Pit 1 suggest that selective deposition of smaller artifacts or cleaning the area of large debris occurred there. It is inferred that this might indicate that Test Pit 1 is near a habitation area.

A very large quantity of charred corn kernels was recovered throughout the midden at Test Pit 1. These are of the Eastern Eight Row variety, and were dried on the cob but charred after removal from the cob. Few corn remains were recovered toward the west edge of the midden, although a 10-row variety cob was recovered from Bank Gully 1. The recovery of a broken bison scapula hoe from Bank Gully 1 supports the contention that agricultural fields were located in the vicinity of the midden.

Faunal remains from the midden suggest emphasis on wetland resource exploitation. The species represented indicate that the wetland fauna were procured from the Mississippi River floodplain rather than the immediately local State Road Coulee wetland. This further suggests that Oneota site selection at the mouth of the State Road Coulee was not to facilitate hunting, thereby supporting the contention that the Oneota intentionally selected the rich wetland soils at the base of the bluffs for agricultural purposes.

It is strongly recommended that further proper management of the 47Lc176 midden be undertaken by the St. Paul Corps of Engineers. At this time it appears that a large portion of this midden will be impacted during construction of the flood control project. Therefore, the alternative of mitigation according to an adequate data recovery plan should be implemented.

Phase II investigations at the sand rise to the west of the Oneota midden at Project Area III found no evidence of significant cultural deposits. Much of the rise has been scraped, removing the cultural bearing Natural A Horizon. Along Pammel Creek, a small area of the A Horizon remains, and produced a few Woodland and Oneota artifacts. However, this area has been affected by bank slumping and extensive rodent disturbance. Therefore, no additional cultural resources investigations are recommended for the sand rise area.

To the southwest of the sand rise, the pre-settlement surface was located under 2 meters of historic alluvium. Cultural materials including Oneota sherds, fire-cracked rock, flakes, and charcoal were recovered from the sealed surface. However, these were rather sparsely scattered, and no features were located in two backhoe trench excavations.

The quantity of materials located at the deeply buried surface to the southwest of the sand rise does not warrant extensive and expensive additional

cultural resources study. Instead, it is recommended that construction activities which would impact this area be monitored by a qualified archaeologist. As with the recommendation for Project Area I, the monitoring archaeologist should be empowered to halt construction if significant cultural deposits are located.

BIBLIOGRAPHY

- Bartlein, Patrick J. and Thompson Webb III
 1982 Holocene Climatic Changes Estimated from Pollen Data from the Northern Midwest. In Quaternary History of the Driftless Area, pp. 67-82. Field Trip Guide Book Number 5, University of Wisconsin-Extension, Geological and Natural History Survey, Madison.
- Beatty, Marvin T.
 1960 Soil Survey of La Crosse County, Wisconsin. United States Department of Agriculture, Soil Conservation Service Report, Series 1956, No. 7.
- Becker, George C.
 1983 Fishes of Wisconsin. The University of Wisconsin Press, Madison.
- Benn, David W.
 1979 Some Trends and Traditions in Woodland Cultures of the Quad-State Region in the Upper Mississippi River Basin. The Wisconsin Archeologist 60(1):47-82.
- Boszhardt, Robert F. and James P. Gallagher
 1983 Cultural Resources Investigation: Survey of Portions of the State Road and Ebner Coulee Project, La Crosse, Wisconsin. Reports of Investigations Number 11, Mississippi Valley Archaeology Center, La Crosse, Wisconsin.
- Boszhardt, Robert F., James P. Gallagher, Thomas Bailey, Robert F. Sasso, and Katherine Stevenson
 1984b Archaeological Investigations at the Mouth of Sand Lake Coulee: The 1982 Season. Mississippi Valley Archaeology Center, Reports of Investigations Number 8.
- Boszhardt, Robert F., James L. Theler, and James P. Gallagher
 1984a A Cultural Resources Evaluation of the Pammel Creek Site (47Lc61): An Oneota Occupation at La Crosse, Wisconsin. Reports of Investigations Number 19, Mississippi Valley Archaeology Center, La Crosse, Wisconsin.
- Boszhardt, Robert F., Thomas W. Bailey, and James P. Gallagher
 Oneota Ridged Fields at the Sand Lake Site (47Lc44) La Crosse County, Wisconsin. The Wisconsin Archeologist 60:47-67
- Brown, Alfred
 1847 Government Land Office Survey Notes for the Interior Sections of Township 15N, Range 7W.
- Cawley, Edward T.
 1973 Final Report, Environmental Impact Assessment Study, Pool 10 of

the Northern Section of the Upper Mississippi River. North Star Research Institute, Minneapolis.

Claflin, Thomas O.

- 1973 Final Report, Environmental Impact Assessment Study, Pool 7 of the Northern Section of the Upper Mississippi River. North Star Research Institute, Minneapolis.

Cutler, Hugh C. and Leonard W. Blake

- 1977 Corn from Cahokia Sites. Explorations into Cahokia Archaeology, edited by Melvin L. Fowler, pp. 122-136. Illinois Archaeological Survey, Inc. Bulletin Number 7. University of Illinois-Urbana.

Gallagher, James P., K. Stevenson, H. Fassler, C. Hill, M. Mills, T. Morrow, K. Motivans, S. Neff, T. Weeth, and R. Withrow

- 1981 The Overhead Site, 47Lc20. Report prepared for State Historical Society, Madison. Copy on file, Historic Preservation Division.

Gallagher, James P. and Katherine Stevenson

- 1982 Oneota Subsistence and Settlement in Southwestern Wisconsin. In Oneota Studies, edited by G.E. Gibbon, pp. 15-28. University of Minnesota Publication in Anthropology 1.

Gallagher, James P., Robert F. Boszhardt, Robert F. Sasso, and Katherine Stevenson

- 1985 Oneota Ridged Field Agriculture in Southwestern Wisconsin. American Antiquity Vol. 50(3):605-612.

Hays, T.R., Duane E. Peter, Olin F. McCormick, and James P. Gallagher

- 1981 Final Report -- Cultural Resources Investigations for the State Road and Ebner Coulee Flood Control Project, La Crosse. Center for Research Archeology, La Crosse. Copy on file, Historic Preservation Division, State Historical Society, Madison.

Knox, James C., P.F. McDowell, and W.C. Johnson

- 1981 Holocene Fluvial Activity and Climatic Change in the Driftless Area, Wisconsin. In Quaternary Paleoclimate, edited by W.C. Mahaney, pp. 107-127. GeoAbstracts, Norwich, England.

Martin, Lawrence

- 1965 The Physical Geography of Wisconsin, 3rd ed. University of Wisconsin Press, Madison.

McKern, William C.

- 1945 Preliminary Report on the Upper Mississippi Phase in Wisconsin. Bulletin of the Public Museum of the City of Milwaukee 16:109-285.

Mickelson, D.M., J.C. Knox, and Lee Clayton

- 1982 Glaciation of the Driftless Area: An Evaluation of the Evidence. In Quaternary History of the Driftless Area, pp. 155-169. Geological and Natural History Survey, Field Trip Guide Book Number 5, University of Wisconsin-Extension, Madison.

Mississippi River Commission

- 1894 Survey of the Mississippi River, Chart No. 173. Julius Bien and Co.
- Munson, Patrick J.
1973 The Origins and Antiquity of Maize-Beans-Squash Agriculture in Eastern North America: Some Linguistic Implications. In Variation in Anthropology, edited by D.W. Lathrap and J. Douglas, pp. 107-135. Illinois Archaeological Survey, Urbana.
- Pammel, Louis Hermann
1907 A Comparative Study of the Vegetation of Swamp, Clay, and Sandstone Areas in Western Wisconsin, Southeastern Minnesota, Northeastern, Central, and Southeastern Iowa. Proceedings of the Davenport Academy of Sciences Vol. 10:32-106.
- Sasso, Robert F.
1984 Archaeological Data Recovery at the Overhead Site, 47Lc20, La Crosse County, Wisconsin. Mississippi Valley Archaeology Center, Reports of Investigations No. 18.
- Schorger, A.W.
1966 The World Turkey: Its History and Domestication. University of Oklahoma press, Horman.
- Stevenson, Katherine, Robert F. Boszhardt, and James P. Gallagher
1983 Oneota Ceramics in the La Crosse, Wisconsin Area: Variation Within and Between Assemblages. Paper presented at Conference on Western Oneota Ceramics, Red Wing, Minnesota, April 16-17.
- Stoltman, James B.
1973 The Overhead Site (47-Lc-20), an Orr Phase Site near La Crosse, Wisconsin. The Wisconsin Archeologist, n.s. 54(1):2-35.
- Stoltman, James B.
1979 Middle Woodland Stage Communities of Southwestern Wisconsin. In Hopewell Archaeology: The Chillicothe Conferences, edited by D.S. Brose and N. Greber, pp. 122-139. Kent State University Press, Kent, Ohio.
- Vehik, Susan
1975 Appendix E., Environmental Impact Assessment, State Road Coulee, Ebner Coulee, La Crosse, Wisconsin. University of Wisconsin-La Crosse River Studies Center.
- Vogt, Richard C.
1981 Natural History of Amphibians and Reptiles in Wisconsin, the Milwaukee Public Museum, Milwaukee, Wisconsin.
- Whitson, A.R., W.J. Geig, and T.J. Dunnewald
1914 Soil Survey of La Crosse County, Wisconsin. Bulletin No. XL, Soil Series No. 10, Madison, Wisconsin.

APPENDIX A

GEOLOGY OF THE PAMMEL CREEK PROJECT AREA LA CROSSE, WISCONSIN

E. Arthur Bettis III, Iowa City, Iowa
Dean M. Thompson, Des Moines, Iowa

Subsurface stratigraphic and pedologic investigations were undertaken in the Pammel Creek project area near La Crosse, Wisconsin on April 21-22, 1984. The objectives were to identify and map alluvial stratigraphic units present within the project area, to determine the relationships between the stratigraphic units and their age, to identify the depositional context of archaeological site 47Lc176 and the boundaries of the archaeological deposit with respect to alluvial stratigraphic units.

A truck-mounted hydraulic soil-coring machine was used to recover intact soil cores. Two- and three-inch diameter cores were extracted and described in the field using standard techniques and terminology (Soil Survey Staff 1975; Bettis 1984). Soil colors reported herein are moist Munsell; all deposits are noncalcareous. Borings extended to a depth at which the core or auger was rejected, or the holes collapsed below the water table. Detailed descriptions and logs of all borings are included in this appendix and referred to by number. The locations of borings, a stack-unit map and longitudinal cross section of alluvial stratigraphic units in the project area is shown on Figure A-1.

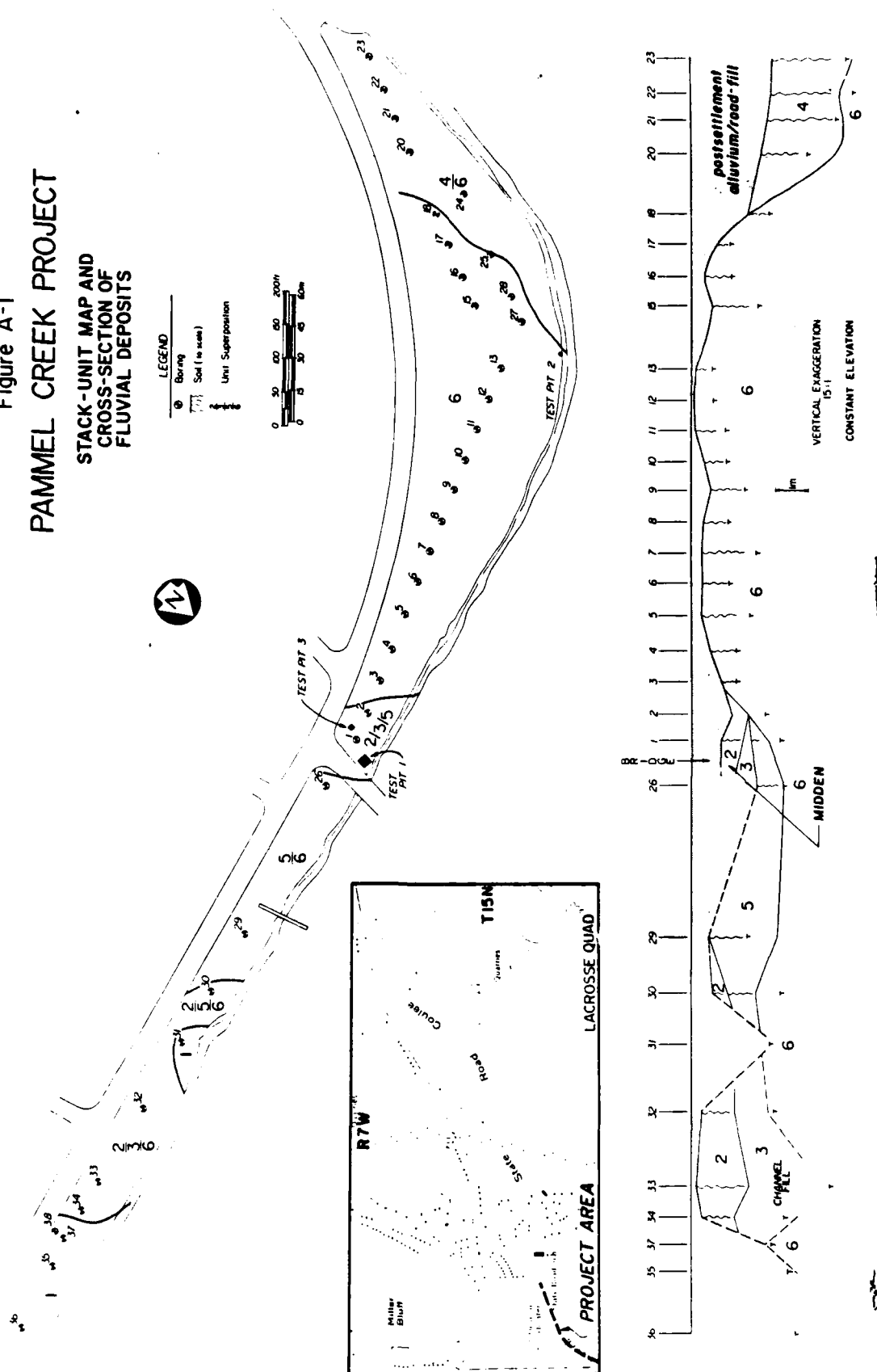
The project area is located along the south bank of Pammel Creek in the SW1/4 of section 10, T15N, R7W (Fig. A-1) at the mouth of State Road Coulee. In this area Jorden sandstone bluffs rise approximately 100m above the Mississippi Valley floor. State Road Coulee is deeply entrenched in a southwest-trending bedrock valley and the entire drainage network appears to be controlled by joints in the Cambrian-age bedrock.

A high, sandy outwash terrace, mantled with blow sand in some areas, is present along the eastern margin of the Mississippi Valley at and above the mouth of the coulee. This terrace and others like it in the Upper Mississippi Valley are presumed to be of Woodfordian age (possibly 13,000 to 12,000 B.P.; Clayton 1982). They are valley-train terraces possibly related to the airport Phases of the Superior Lobe (Ibid:85). From latest Wisconsinan through Holocene time, the terrace acted as a dam at the mouth of State Road Coulee, causing a drastic reduction in Pammel Creek's gradient and promoting development of a wetland. In addition, the sandy terrace surface provided a ready source for blow sand.

Six alluvial depositional units were identified and mapped in the project area. In order of increasing age they are:

1. Dark grayish brown to yellowish brown (10YR4/2-5/3) stratified loam and silt loam (HISTORIC/POSTSETTLEMENT)

Figure A-1
PAMMEL CREEK PROJECT
 STACK-UNIT MAP AND
 CROSS-SECTION OF
 FLUVIAL DEPOSITS



2. Dark (10YR4/1-3/2) loam to silt loam containing an Oneota midden 47Lc176 (LATE PREHISTORIC/LATE HOLOCENE)
3. Stratified loam and sandy loam channel fill closely related in time to Unit 2 (LATE PREHISTORIC/LATE HOLOCENE)
4. Dark (10YR3/1-4/2) silt loam and loam found only in the western portion of the project area (EARLY HOLOCENE TO EARLY LATE HOLOCENE?)
5. Dark (10YR3/1-4/3) silty clay loam to loam often with an eroded upper surface (EARLY HOLOCENE THROUGH EARLY LATE HOLOCENE?)
6. Oxidized loamy sand (WOODFORDIAN TO EARLY HOLOCENE)

Units 1 through 5 represent episodes of cutting and filling by Pammel Creek during the Holocene (approximately 10,500 B.P. to present). Unit 6 probably represents outwash and eolian sand deposited by the interaction of the La Crosse and Mississippi Rivers. It is found as a terrace south of the project area where the Plainville loamy fine sand soil series, an entisol, is developed in its surface (Beatty 1960: sheet 14). Within the project area, Unit 6 is buried by historic sediment (Unit 1) ranging from 12cm to over 2m in thickness (see Fig. A-1). Unit 6 is comprised of fine to medium loamy sand grading to medium sand at depth. Where its surface has not been truncated, Unit 6 has an entisol or in a few cases an inceptisol developed into it (see detailed core description B). Its texture prevented coring below a depth of about 2m.

Unit 5 is inset into Unit 6 and is buried by younger deposits. It was encountered only in the east-central part of the project area. Where its surface has not been eroded an inceptisol or mollisol is developed into it (see detailed core descriptions A and D). In and around Test Pit 1, Unit 5 is partially truncated; remnants of an argillic horizon are present. The grayish brown colors of the subsoil in Unit 5, combined with the presence of gray mottles (see detailed core description D) indicate that Unit 5 was in a somewhat poorly to poorly drained position during development of the soil in the upper part. The moderately developed soil in the surface and its position beneath known late Holocene alluvial fills suggest that Unit 5 may be early to mid-Holocene in age and possibly equivalent to McDowell's Unites "D" or "E" in Brush Creek Valley, Wisconsin (McDowell 1982, 1983).

Unit 4 is also inset into Unit 6 and buried by Unit 1. It was found only in the western portion of the project area. It is coarser textured than Unit 5 and has a thick mollisol developed into it (see detailed core description C). The dark colors and mottles present in the unit suggest that it too was a somewhat poorly drained position during development of the soil in its surface. The stratigraphic relationships between Units 4 and 5 are not known. Both have moderately developed soils in their surface in contrast to the remainder of the units present in the project area. Unit 4 is tentatively correlated with Unit 5 on this basis. The coarser texture of Unit 4 may be attributable to the meandering of Pammel Creek into the sandy Unit 6 terrace in the western portion of the project area, whereas Unit 4 deposits accumu-

lating in the eastern aprt were originating from finer-textured deposits farther up the State Road Coulee valley.

Unit 3 was encountered only in the east-central portion of the project area. It is inset into Units 5 and 6 and is buried by Unit 2 and/or 1. Where it was observed in cores and stream banks, its stratified nature, pebbles, and lags of late Middle Woodland potsherds indicate that it represents the basal portion of a channel fill and/or bars. The presence of redeposited Woodland potsherds in Unit 3 and its burial by Unit 2 suggest that it is Late Holocene in age.

Unit 2 is the depositional context of an Oneota midden (47Lc176). It was encountered only in the east-central portion of the project area (see Fig. A-1) where it buried Unit 3 and is, in turn, buried by Unit 1. It probably is an overbank facies temporally related to Unit 3. Unit 2 has an ineptisol extensively influenced by human activity (midden formation) developed into it (see detailed core description A). The presence of the Oneota midden identifies the unit as Late Prehistoric in age. Units 2 and 3 may be equivalent to McDowell's Unit "B" in Brush Creek (Ibid.).

Unit 1 is the surficial deposit throughout the project area. It ranges from a few centimeters to over 2m in thickness. Little or no soil development has occurred in the surface. Historic debris was located within the unit in boring 38. The presence of historic debris, the degree of stratification, the virtual absence of soil development, and the fact that it buries all other units, indicate that it is historic-postsettlement alluvium. This deposit has been extensively documented in southwest Wisconsin (Knox 1977; Knox et al. 1981; McDowell 1983) where its origin has been related to increased runoff and sedimentation resulting from land clearing, intensive agriculture and urbanization.

The Pammel Creek project area contains a diversity of alluvial stratigraphic units that were deposited from the late Woodfordian to the present. The limited size of the project area and the extent of urban development precluded detailed reconstruction of the Holocene history of the valley. Nevertheless, the identified alluvial sequence appears similar to that documented by Knox and co-workers in southwest Wisconsin (Knox and Johnson 1974; Knox et al. 1981).

Archaeological site 47Lc176 was first identified along the south bank of Pammel Creek at depth of about 1m or less. Shovel testing along the length of the project area (equivalent to the boring transect on Fig. A-1) suggested that the site might be extensive. Inspection of test pits 1 and 3 (Fig. A-1) and the south bank of the creek indicated that the Oneota midden was associated with the dark alluvial deposit subsequently identified as Unit 2. Transect borings identified Unit 2 as overbank deposits distributed in the east-central portion of the project area. In this area, Unit 2 alluvium containing the Oneota midden is defined by stratigraphic relationships to older alluvial units and thereby limited to an area less than 20 by 40m in vicinity of test pits 1 and 3 adjacent to the "Drive-in" bridge.

A broader distribution of archaeological materials is indicated by the

presence of lithic debitage in transect shovel test of surfaces and the presence of lithic debitage and Woodland potsherds in the south bank of Pammel Creek. These materials were recovered from surfaces correlated with Unit 6 or buried in Unit 3 channel fill. Since these units predate Oneota culture, the Oneota occupation may have been more extensive than the midden preserved in Unit 2 alluvium. However, broader distribution of the Oneota occupation would have been limited to the surface of older alluvial deposits, especially the Unit 6 terrace. As shown by borings, most older surfaces have been eroded or disturbed by historic earthmoving. The Oneota midden buried in Unit 2 thus appears to be the only undisturbed portion of Oneota occupation(s) within the project area.

Woodland potsherds were collected from stratified deposits identified as Unit 3 and interpreted as channel fill. Woodland pottery was also recovered from the same context in borings. Undisturbed Woodland components were not encountered within Unit 3, and may have been eroded from the Unit 4 and/or 5 surfaces in the eastern part of the project area.

REFERENCES CITED

- Beatty, M.T.
1960 Soil Survey of La Crosse County, Wisconsin. U.S. Department of Agriculture, Soil Conservation Service. Government Printing Office: Washington D.C.
- Bettis, E.A. III
1984 New Conventions for the Description of Soil Horizons and Lays. Plains Anthropologist 29(103):57-59.
- Clayton, L.
1982 Influence of Agassiz and Superior Drainage on the Mississippi River. IN Quaternary History of the Driftless Area. Field Trip Guidebook No. 5, Wisconsin Geological and Natural History Survey, pp. 83-87.
- Knox, J.C.
1977 Human Impacts on Wisconsin Stream Channels. Annals of the Association of American Geographers 67(3):323-342.
- Knox, J.C. and W.C. Johnson
1974 Late Quaternary Valley Alluviation in the Driftless Area of Southwestern Wisconsin. IN Late Quaternary Environments of Wisconsin, J.C. Knox and D.M. Mickelson, editors. American Quaternary Association Guidebook for 3rd Biennial Meeting, Madison, Wisconsin, pp. 134-162.
- Knox, J.C., P.F. McDowell and W.C. Johnson
1981 Holocene Fluvial Stratigraphy and Climatic Change in the Driftless Area, Wisconsin. IN Quaternary Paleoclimate, W.C. Mahaney editor, pp. 107-127. Geo Abstracts, Norwich.
- McDowell, P.F.
1982 Soil Development in Late Wisconsinan and Holocene Valley Deposits, Brush Creek Valley, Wisconsin. IN Quaternary History of the Driftless Area. Field Trip Guidebook No.5, Wisconsin Geological and Natural History Survey, pp. 135-154.
- 1983 Evidence of Stream Response to Holocene Climatic Change in a Small Wisconsin Watershed. Quaternary Research 19(1):100-116.
- Soil Survey Staff
1975 Soil Taxonomy. U.S. Department of Agriculture, Soil Conservation Service. Agriculture Handbook No. 436. Washington, D.C.

DESCRIPTIONS OF UNDISTURBED CORES

DETAILED CORE DESCRIPTION A

LOCATION: approximately 4m S-SE of Test Pit 1

PARENT MATERIAL: alluvium;

LANDSCAPE POSITION: floodplain

SLOPE: 8;

VEGETATION: sod

Unit	Depth (cm)	Hor- izon	Description
1	0-13	A	dark brown (10YR3/3) silt loam; very weak fine granular; friable; noneffervescent; clear boundary; abundant roots; strata evident at base of horizon
1	13-87	C	dark brown and dark yellowish brown (10YR3/3&4/4) stratified silt loam; massive breaks along horizontal bedding planes; friable; noneffervescent; abrupt boundary; occasional insect burrows (Note: upper beds from 1 to 4cm in thickness)
2	87-97	2A1b	black to very dark gray (10YR2/1-3/1) loam; moderate fine subangular blocky breaking to moderate-medium granular; friable; noneffervescent; gradual boundary; occasional burrows with dark brown (10YR-3/3) infillings
2	97-124	2A2b	black to very dark gray (10YR2/1-3/1) loam; moderate medium subangular blocky; friable; noneffervescent; gradual boundary; occasional burrows common charcoal
2	124-151	2A3b	very dark brown to very dark grayish brown (10YR 2/2-3/2) silt loam; weak to moderate medium to coarse subangular blocky; friable; noneffervescent; clear boundary; occasional charcoal flecks
2	151-175	2Bb	very dark grayish brown (10YR3/2) silt loam; moderate medium prismatic breaking to moderate medium subangular blocky; friable; noneffervescent; clear boundary; common burrows infilled with very dark gray (10YR3/1) silt loam; occasional pieces of charcoal
2	175-198	2BCb	very dark gray to very dark grayish brown (10YR 3/1-3/2) loam; weak medium to fine subangular blocky; very friable; noneffervescent; abrupt boundary; common fine brown (7.5YR4/4) mottles
3	198-219	2C	very dark grayish brown and yellowish brown (10YR 3/2 and 5/4) stratified silt loam and fine to medium sand; massive; very friable and loose; noneffervescent; abrupt boundary; two grit-tempered potsherds (Woodland), one small sandstone pebble
5	219-250	3Bb	very dark grayish brown (10YR3/2) silty clay loam; moderate to strong medium prismatic breaking to strong fine angular blocky; friable; noneffervescent; gradual boundary; abundant fine dark reddish brown (5YR3/4) accumulations on some peds; few medium oxides

5	250-265	3BCb	dark brown (10YR3/3) silty clay loam (more sand than above); moderate medium prismatic; friable; noneffervescent; abrupt boundary
6	265-307 (base)	4BCb	brown (7.5YR4/4) sandy loam; weak medium subangular blocky; friable; noneffervescent

DETAILED CORE DESCRIPTION B

LOCATION: boring #11

PARENT MATERIAL: alluvium;

SLOPE: B;

LANDSCAPE POSITION: terrace

VEGETATION: sod

Unit	Depth (cm)	Hor- izon	Description
1	0-5	+	dark yellowish brown (10YR3/4) fine to medium sand; single grain; loose; noneffervescent; abrupt boundary; common roots
1	5-9	+	dark brown (10YR3/3) stratified silt loam; massive; friable; noneffervescent; abrupt boundary; common roots
6	9-17	A1	very dark grayish brown (10YR3/2) sandy loam; weak medium granular; friable; noneffervescent; clear boundary
6	17-30	A2	very dark grayish brown to dark brown (10YR3/2-3) sandy loam; weak medium subangular blocky; very friable; noneffervescent; clear boundary
6	30-41	B1	very dark grayish brown to dark brown (10YR3/2-3) sandy loam; very weak medium prismatic breaking to weak medium subangular blocky; very friable; noneffervescent; gradual boundary
6	41-72	B2	dark brown (10YR3/3) loamy sand; very weak medium subangular blocky; very friable; noneffervescent; clear boundary
6	72-85	BC	dark yellowish brown (10YR3/4) loamy sand; very weak medium subangular blocky; very friable; noneffervescent; clear boundary
6	85-138	C	yellowish brown to light yellowish brown (10YR5/4-5/6) medium sand; single grain; loose; noneffervescent

DETAILED CORE DESCRIPTION C

LOCATION: boring #20

PARENT MATERIAL: alluvium;

SLOPE: B;

LANDSCAPE POSITION: floodplain

VEGETATION: sod

Unit	Depth (cm)	Hor- izon	Description
1	0-40	C1	dark brown (10YR3/3) stratified silt loam and loam; massive; very compact; firm; noneffervescent; abrupt boundary; common rocks; (road-fill)
1	40-215	C2	dark brown and yellowish brown stratified silt loam with occasional medium sand beds; massive;

			breaks along horizontal bedding planes; friable; noneffervescent; abrupt boundary; occasional brown (7.5YR4/4) mottles concentrated along bedding planes; lower 20cm contains common insect burrows with very dark gray (10YR3/1) infillings
4	215-224	2A1b	very dark gray to very dark grayish brown (10YR3/1-3/2) silt loam; moderate medium granular; friable; noneffervescent; clear boundary; common to abundant insect burrows with dark brown (10YR-2/3) infillings
4	224-239	2A2b	black to very dark gray (10YR2/1-3/1) loam; weak to moderate medium subangular blocky; friable; noneffervescent; clear boundary; occasional burrows as above
4	239-284	2ABb	very dark brown (10YR3/2) loam; weak medium prismatic breaking to weak medium subangular blocky; friable; noneffervescent; clear boundary
4	284-305	2B1b	very dark grayish brown (10YR3/2) loam (with more clay than above); weak to moderate medium prismatic; friable; noneffervescent; gradual boundary; very few fine dark brown (10YR3/3) mottles
4	305-335	2B2b	very dark grayish brown to dark grayish brown (10YR3/2-4/2) loam; weak to moderate medium subangular blocky; friable; noneffervescent; clear boundary; few fine dark brown (10YR3/3) mottles
4	335-354	2B3b	dark grayish brown (10YR4/2) silt loam; weak medium to fine subangular blocky; friable; noneffervescent; abrupt boundary; few fine reddish brown (5YR4/4) concretions
6	354-381	3B4b	dark brown to brown (10YR3/3-4/3) loam; moderate medium subangular blocky; friable; noneffervescent; clear boundary; abundant medium reddish brown (5YR4/4) concretions; few medium oxides
6	381-410 (base)	3C	brown (7.5YR4/4) loamy medium sand; single grain; loose; noneffervescent

DETAILED CORE DESCRIPTION D

LOCATION: boring #30

PARENT MATERIAL: alluvium;

LANDSCAPE POSITION: floodplain

SLOPE: C;

VEGETATION: Grass

Unit	Depth (cm)	Hor- izon	Description
1	0-65	C	dark grayish brown, dark yellowish brown and brown (10YR4/2,4/4&5/3) stratified silt loam and medium sand; friable; noneffervescent; abrupt boundary; occasional brown (7.5YR4/4) accumulations along bedding planes above sand beds
2	65-98	2A1b	very dark gray (10YR3/1) loam; weak medium subangular blocky; friable; noneffervescent; gradual boundary; common insect burrows
2	98-111	2A2b	very dark gray (10YR3/1) loam; weak fine subangular blocky; friable; noneffervescent; abrupt boundary; burrows as above

5	111-129	3A1b	black to very dark gray (10YR2/1-3/1) silt loam; moderate fine to medium granular; friable; noneffervescent; clear boundary
5	129-137	3A2b	very dark gray (10YR3/1) heavy silt loam; moderate medium subangular blocky; friable; noneffervescent; clear boundary
5	137-153	3B1b	very dark gray to very dark grayish brown (10YR3/1-3/2) silty clay loam; moderate medium prismatic breaking to moderate fine angular blocky; friable; noneffervescent; gradual boundary
5	153-170	3B2b	Very dark gray to dark gray (10YR3/1-4/1) silty clay loam; moderate medium prismatic breaking to weak medium subangular blocky; friable; noneffervescent; clear boundary; few fine dark grayish brown (10YR4/2) mottles
5	170-202	3BCb	brown (10YR4/3) light silty clay loam; moderate medium columnar; friable; noneffervescent; clear boundary; common fine dark grayish brown (10YR4/2) mottles; common fine iron concretions
5	202-230	3CBb	very dark grayish brown (10YR3/2) loam; weak to moderate medium subangular blocky; friable; noneffervescent; clear boundary; common fine very dark gray (10YR3/1) mottles; few fine iron concretions
6	230-270 (base)	4C	dark yellowish brown (10YR4/4) sandy loam; single grain; loose; noneffervescent

LOGS OF BORINGS

HOLE: 1

Unit	Depth	Description
1	0-90	postsettlement alluvium, stratified silt loam, abrupt boundary
2	90-160	midden (47LC176), black to very dark grayish brown silt loam, charcoal, bone, gradual boundary
3	160-183	stratified silt loam and sand, abrupt boundary
5	183-220	silty clay loam, truncated Bt horizon, clear boundary
5/6	220-240	sandy loam, B horizon, gradual boundary
6	240-270	oxidized fine to medium sand

(See detailed core description "A")

HOLE: 2

Unit	Depth	Description
1	0-100	postsettlement alluvium, abrupt boundary
1	100-122	dark grayish brown, stratified silt loam and medium sand, abrupt boundary
2/3	122-176	dark silt loam becoming stratified at base, clear boundary
6	176-222	oxidized medium sand

HOLE: 3

Unit	Depth	Description
1	0-97	postsettlement alluvium and road fill, some very compact zones, abrupt boundary
6	97-127	truncated Ab horizon developed in medium sand, gradual boundary
6	127-140	Bwb horizon developed in medium sand

HOLE: 4

Unit	Depth	Description
1	0-66	postsettlement alluvium, compact silt loam
6	66-114	Ab horizon developed in sandy loam, gradual boundary

HOLE: 5

Unit	Depth	Description
1	0-37	road fill, stratified loam and sandy loam, very compact, abrupt boundary
6	37-110	compacted Ab horizon developed in loamy sand, gradual boundary
6	110-140	Bwb horizon developed in loamy sand, clear boundary
6	140-180	oxidized medium sand

HOLE: 6

Unit	Depth	Description
1	0-40	postsettlement alluvium, stratified silt loam and loamy sand, abrupt boundary
6	40-90	Ab horizon developed in loamy sand, gradual boundary
6	90-117	Bw horizon developed in loamy sand

HOLE: 7

Unit	Depth	Description
1	0-36	postsettlement alluvium, stratified silt loam and sandy loam, abrupt boundary
6	36-100	Ab horizon developed in loamy sand, gradual boundary
6	100-160	Bw horizon developed in sandy loam, clear boundary
6	160-200	medium sand grading to coarse sand at the base

HOLE: 8

Unit	Depth	Description
1	0-36	postsettlement alluvium, stratified loamy sand, abrupt boundary
6	36-96	Ab horizon developed in loamy sand, gradual boundary
6	96-112	Bwb horizon developed in loamy sand

HOLE: 9

Unit	Depth	Description
1	0-68	postsettlement alluvium, stratified silt loam and sand, abrupt boundary
6	68-139	Ab horizon developed in loamy sand, clear boundary
6	139-168	Bw horizon developed in loamy sand

HOLE: 10

Unit	Depth	Description
1	0-44	postsettlement alluvium, stratified silt loam and loamy sand, compact
6	44-80	Ab horizon developed in loamy sand, clear boundary
6	80-112	Bwb horizon developed in loamy sand

HOLE: 11

Unit	Depth	Description
1	0-18	postsettlement alluvium, stratified silt loam, abrupt boundary
6	18-53	Ab horizon developed in loamy sand, clear boundary
6	53-83	Bwb horizon developed in loamy sand, clear boundary
6	83-110	fine to medium sand

(See detailed core description "B")

HOLE: 12		
Unit	Depth	Description
1	0-12	postsettlement alluvium, silt loam, abrupt boundary
6	12-18	truncated A horizon in loamy sand, occasional charcoal flecks, clear boundary
6	18-70	fine to medium sand

HOLE: 13		
Unit	Depth	Description
1	0-20	postsettlement alluvium, stratified silt loam and loamy sand, abrupt boundary
6	20-48	sandy loam, Ap horizon with occasional charcoal flecks, abrupt boundary
6	48-66	fine to medium sand

HOLE: 15		
Unit	Depth	Description
1	0-56	postsettlement alluvium, stratified silt loam and loamy sand, abrupt boundary
1/6	56-75	Ap horizon in loamy sand with silt loam bed at base, compact, abrupt boundary
6	75-134	Ap horizon developed in loamy sand, gradual boundary
6	134-140	Bwb horizon developed in loamy sand, clear boundary
6	140-208	medium sand

HOLE: 16		
Unit	Depth	Description
1	0-47	postsettlement alluvium, stratified silt loam and loamy sand, cinders at 30cm
6	47-87	Ab horizon developed in loamy sand, upper portion compact, gradual boundary
6	87-127	Bwb horizon developed in loamy sand

HOLE: 17		
Unit	Depth	Description
1	0-77	postsettlement alluvium, stratified silt loam with sand stringers, abrupt boundary
6	77-107	Ab horizon developed in loamy sand, clear boundary
6	107-120	Bwb horizon developed in loamy sand

HOLE: 18		
Unit	Depth	Description
1	0-180	postsettlement alluvium, stratified silt loam with occasional sand beds, abrupt boundary
6	180-230	Ab horizon developed in loamy sand, clear boundary
6	230-245+	Bwb horizon developed in loamy sand

HOLE: 20

Unit	Depth	Description
1	0-216	postsettlement alluvium, stratified silt loam with occasional sand beds, abrupt boundary
4	216-264	Ab horizon developed in loam, clear boundary
4	264-360+	Bb horizon developed in loam

(See detailed core description "C")

HOLE: 21

Unit	Depth	Description
1	0-239	postsettlement alluvium, stratified silt loam, abrupt boundary
4	239-265	A1b developed in silt loam, clear boundary
4	265-287	A2b developed in silt loam, clear boundary
4	287-328	ABb horizon developed in silty clay loam, clear boundary
4	328-352	B1b horizon developed in silty clay loam, clear boundary
4	352-402	B2b horizon developed in loam, clear boundary
4	402-420	B3b horizon developed in loam, clear boundary
4/6	420-227+	B4b horizon developed in sand loam

HOLE: 22

Unit	Depth	Description
1	0-249	postsettlement alluvium, stratified silt loam, abrupt boundary, 0-97 compacted road-fill
4	249-269	A1b horizon developed in loam, clear boundary
4	269-314	A2b horizon developed in loam, gradual boundary
4	314-347	B1b horizon developed in loam, clear boundary
4	347-380	B2b horizon developed in clay loam, clear boundary
4	380-440	BCb horizon developed in silty clay loam, clear boundary
4/6	440-460	CBb developed in loam, clear boundary
6	460-500+	oxidized medium sand

HOLE: 23

Unit	Depth	Description
1	0-259	postsettlement alluvium, stratified silt loam, upper 80 cm very compact, abrupt boundary
4	259-283	A1b horizon developed in loam, clear boundary
4	283-313	A2b horizon developed in loam, clear boundary
4	313-335	ABb horizon developed in loam, clear boundary
4	335-359	Bb horizon developed in silt loam, clear boundary
4	359-399	B2b horizon developed in loam, clear boundary
4	399-448	BCb horizon developed in silt loam, mottled clear boundary
4	448-478+	silt loam, mottled

HOLE 24

Unit	Depth	Description
1	0-192	postsettlement alluvium, stratified silt loam and loamy sand, abrupt boundary
4	192-221	A1b horizon developed in loamy sand, clear boundary
4	221-260	A2b horizon developed in loamy sand, clear boundary
4	260-271	A3b horizon developed in loamy sand, clear boundary
4	271-291	ABb horizon developed in loamy sand
4	291-320+	Bwb horizon developed in loamy sand

HOLE: 25

Unit	Depth	Description
1	0-154	postsettlement alluvium, stratified silt loam and loamy sand, abrupt boundary
6	154-178	A1b horizon developed in loamy sand, clear boundary
6	178-202	A2b horizon developed in loamy sand, clear boundary
6	202-238	Bwb horizon developed in loamy sand, clear boundary
6	238-270+	oxidized medium sand

HOLE: 26

Unit	Depth	Description
1	0-120	postsettlement alluvium, stratified silt loam and sand, abrupt boundary
1	120-204	very dark grayish brown stratified silt loam, abrupt boundary
5	204-227	truncated Ab horizon developed in silty clay loam, clear boundary
5	227-240	ABb horizon developed in silt loam, clear boundary
5/6	240-284	Bb horizon developed in loam, clear boundary
6	284-320+	oxidized medium sand

HOLE: 27

Unit	Depth	Description
1	0-98	postsettlement alluvium, stratified silt loam, abrupt boundary
6	98-122	Ab horizon developed in sandy loam, clear boundary
6	122-164	Bwb horizon developed in loamy sand, clear boundary
6	164-230+	oxidized fine to medium sand

HOLE: 28

Unit	Depth	Description
1	0-89	postsettlement alluvium, stratified silt loam, abrupt boundary
6	89-130	Ab horizon developed in sandy loam, clear boundary
6	130-187	Bwb horizon developed in loamy sand, gradual boundary
6	187-205	BCb horizon developed in sandy loam, clear boundary
6	205-220+	oxidized medium sand

HOLE 29

Unit	Depth	Description
1	0-55	postsettlement alluvium, stratified silt loam, abrupt boundary
5	55-87	Ab horizon developed in silt loam, gradual boundary
5	87-143	Bb horizon developed in silty clay loam
5	143-170+	BCb horizon developed in silty clay loam

HOLE: 30

Unit	Depth	Description
1	0-64	postsettlement alluvium, stratified silt loam and sand, abrupt boundary
2	64-111	Ab horizon developed in loam, abrupt boundary
5	111-137	Ab horizon developed in silt loam, clear boundary
5	137-202	Bb horizon developed in silty clay loam, gradual boundary
6	202-270+	oxidized sandy loam

(See detailed description "D")

HOLE: 31

Unit	Depth	Description
1	0-65	postsettlement alluvium, stratified silt loam clear boundary
1	65-235+	postsettlement alluvium, stratified sand

HOLE: 32

Unit	Depth	Description
1	0-32	road-fill, loamy, abrupt boundary
2	32-133	A horizon developed in loam, occasional charcoal flecks, clear boundary
3	133-230	dark stratified silt loam and sand, abrupt boundary
6	230-250+	oxidized medium sand

HOLE: 33

Unit	Depth	Description
1	0-15	postsettlement alluvium, silt loam, abrupt boundary
2	15-54	Ab horizon developed in loam, gradual boundary
2	54-132	Bwb horizon developed in loam, clear boundary
2	132-169	CBb horizon developed in loam with sand stringers clear boundary
2/3	169-420+	silt loam grading to sand, mottled

HOLE: 34

Unit	Depth	Description
1	0-42	postsettlement alluvium, silt loam, abrupt boundary
2	42-100	Ab horizon developed in loam, clear boundary
2	100-132	ACb horizon developed in silt loam, clear boundary
3	132-280+	stratified silt loam and silty clay loam

HOLE: 35		
Unit	Depth	Description
1	0-290	postsettlement alluvium, stratified silt loam, clay loam and fine to medium sand

HOLE: 36		
Unit	Depth	Description
1	0-310+	postsettlement alluvium, stratified silt loam and sand

HOLE: 37		
Unit	Depth	Description
1	0-230	postsettlement alluvium, stratified silt loam and fine sand, abrupt boundary
6	230-240+	oxidized medium sand

HOLE: 38		
Unit	Depth	Description
1	0-250	postsettlement alluvium, stratified silt loam and sand, piece of rubber at 90cm
2b	250-287	developed in silt loam, clear boundary
4	287-328	ABb horizon

APPENDIX B
CORRESPONDENCE



Mississippi Valley Archaeology Center, Inc.

1725 State Street

• La Crosse, Wisconsin 54601

• (608) 785-8463

OFFICERS

President

Warren Loveland, Jr., President
Loveland Development Corporation

Vice President

James White, Director
La Crosse Public Library

Secretary-Treasurer

Martin Zanger, Professor
University of Wisconsin-La Crosse

EXECUTIVE DIRECTOR

James P. Gallagher, Associate Professor
University of Wisconsin-La Crosse

STAFF

Katherine Stevenson,
Regional Archaeologist

Robert F. Bozhardt,
Staff Archaeologist

BOARD OF DIRECTORS

Margaret Annett
La Crosse, WI

Kenneth Dahl, President
Dahl Ford Subaru

Philo Davy, President
Davy Engineering Company, Inc.

Daniel Gelatt, President
Northern Micrographics, Inc.

Michael Hartigan, Physician
Gundersen Clinic Ltd.

Edwin Hill, Director
Area Research Center,
University of Wisconsin-La Crosse

Jay Hoeschler, Vice President
Hoeschler Realty Corporation

Maureen Kinney, Attorney
Johns Flaherty & Gillette SC

Hope Kumm
La Crosse, WI

Frank Linder, General Manager
Dairyland Power Cooperative

Kenneth Lindner, Distinguished Professor
University of Wisconsin-La Crosse

Penny Murn
West Salem, WI

Clark Nixon, President
Bank of Calvesville, Calvesville, WI

Robert Obma, Physician
Skemp-Grandview-La Crosse Clinic, Ltd.

Narcelle Schneider, President
Piggy's Front Street Restaurant

Harry Schroeder, Vice President
HSR Associates, Inc.

Stuart Struever, Director
Center for American Archaeology,
Evanston, Illinois

James Terman, Physician
Gundersen Clinic, Ltd.

Thomas Trow, Archaeologist
Institute for Minnesota Archaeology,
Minneapolis, Minnesota

Robert Voight, Dean
University of Wisconsin-La Crosse

John Webaunsee, Director
La Crosse Legal Services, Inc.

D. Fred Wendorf, Archaeologist
Southern Methodist University, Dallas, Texas

May, 14 1984

David Berwick

U.S. Army Corps of Engineers

1135 U.S. Post Office and Customs House

St. Paul, Minnesota 55101

Dear Dave,

This letter is to inform you of the preliminary results of our work this spring at the State Road Coulee flood control project. I also enclose 15 copies and the original of the final report on the Phase I work at State Road Coulee last year. This report now includes the recently available radiocarbon date from 47Lc176.

This year's cultural resources investigations for the State Road Coulee flood control project consisted of two segments, Phase I survey of approximately 4.5 acres of Mississippi River floodplain at the mouth of Pammel Creek, a narrow linear segment along Pammel Creek from Drive In Road to Hagen Road at the mouth of State Road Coulee, and Phase II testing at 47Lc176.

Survey of the floodplain area at the mouth of Pammel Creek was accomplished through systematic shovel testing. The land is highest at the northern end and dips gradually to the south. At the time of the survey, all of the project area was above water, though just barely so at the southern end. Beginning at the northern end, three transects were initiated with shovel test holes 15 meters apart. These holes revealed historic alluvium from the surface to the water table (1.25 meters below the surface). No sign of in-situ cultural deposits were detected above the water table. Proceeding southward, the water table was encountered at ever shallower depths, with historic alluvium being the only sediments exposed. When the water table was reached at a depth of 25 cm, the survey shifted to a single transect which was continued to the southern limits of the project area.

Although the entire 4.5 acre tract was not completely covered by the systematic shovel testing, the sampled area revealed that the entire project area has a mantle of historic alluvium to at least the depth of the water table. The probability of their being in-situ cultural deposits within these sediments is negligible. We were especially concerned with the northeast most portion of the project area, which is adjacent to the Oneota area of the Overhead Site (47Lc20). However, no indication of an extension of that site was found due to the historic sediments. The present slight rise from the floodplain project area to the Overhead site is misleading

due to the fact that nearly one meter of the known site area was stripped in the early 1970's, and that over one meter of historic alluvium has covered the lower floodplain surface.

Given these results, recommendations for additional cultural resources investigations in this area do not seem in order. However, we must caution for the possibility of deeply buried cultural deposits. This especially important given the results of Overstreet's work in Pool 10. We did not reach the prehistoric floodplain surface at the mouth of Pammel Creek, and therefore we cannot deny the possibility that cultural deposits (potentially in a tremendous state of preservation) might exist within this portion of the project area.

The Phase I survey from Drive In Road to Hagen Road at the mouth of State Road Coulee was accomplished by cleaning bank cuts at 30 meter intervals along the creek. In addition, geomorphological consultants conducted soil coring in the narrow strip between the creek and Pammel Creek Road. Near Drive In Road bridge, the interval between bank cuts was reduced in an attempt to define the eastern edge of 47Lc176.

Cultural materials were recovered in bank cuts for 30 meters to the east of Drive In Road bridge. These included Oneota ceramics and other artifacts in a fine black sandy matrix which is comparable to the context of the materials found in the 1983 Bank Cuts 1 and 2 to the west of the bridge, and where 47Lc176 was identified. In addition, late Middle and Late Woodland ceramics were recovered in coarse sands beneath the Oneota layers. This suggested that the site might contain a stratified midden with several cultural manifestations represented. However, preliminary geomorphological interpretation of the Woodland levels indicated that these materials are probably slightly redeposited in an ancient stream channel which was subsequently filled and used by the Oneota.

At 120 meters to the east of Drive In Road bridge, a medium-brown, sandy natural A horizon was revealed overlying light sands. This profile resembled the 1983 Bank Cut 10 to the west of the bridge where a single flake had been recovered. No cultural materials were identified from the bank cut 120 meters to the east of the bridge, but this profile indicates the presence of another sandy rise in the old Pammel Creek floodplain.

At 210 meters to the east of the Drive In Road bridge, Oneota cultural materials were recovered from very dark fine sands resembling the Oneota horizon at 47Lc176. This area is physically separated from the 47Lc176 midden by the sand rise identified at 120 meters to the east of the bridge, and we will probably report this as a second site area.

The remaining section of this portion of the flood control project was found to contain great amounts of historic alluvium. Geomorphological coring at the Hagen Road end of the project area indicated that a stream channel bed exists beneath the alluvium virtually precluding the possibility of in-situ cultural remains.

Phase II investigations at 47Lc176 involved exposure of a 5 x 5 meter area immediately west of Drive In Road bridge. This unit corresponded with the 1983 Bank Cut 1, and was excavated in order to determine the presence or absence of ridged fields as well as evaluate any other cultural contexts. A 2 x 2 meter control unit was excavated through the prehistoric cultural horizon in the SW corner of the 5 x 5 meter area. In addition, bank cuts were cut to the west in order to define that edge of the site area, a 2 x 2 meter unit was excavated at the location of the 1983 Bank Cut 10 where a single flake had been recovered on a sandy rise, additional shovel testing was conducted away from the latter unit in order to attempt to define the distribution of cultural materials on the sandy rise, geomorphological coring was undertaken throughout the project area from Drive In Road to Ward Avenue, and back hoe trenches were excavated at the southwestern portion of this segment of the flood control project area.

The 5 x 5 meter area at Drive In Road bridge documented historic alluvium overlying a dark fine sandy horizon which contained prehistoric remains. The surface of the prehistoric horizon did not undulate as might have been expected if ridged fields were present. However, a series of ENE - WSW oriented light streaks (originally thought to be early plow scars) were found to be alluvium filled swales which might yet indicate the presence of ridged fields. At this time, we are still not certain.

The cultural materials contained within the dark sand suggests that the area was used by an Oneota group as a dump. A wide assortment of lithic, ceramic, bone, shell, and charred floral remains were recovered from the 2 x 2 meter control unit. The charred floral remains include a very high quantity of corn kernels. Prehistoric materials were recovered in the control unit from 68 - 180 cm below the surface. (The upper 68 cm was historic alluvium. In the lowest levels the soil changed to a mottled coarse sand, and Woodland ceramics were recovered. As stated previously, the Woodland materials in coarse sands are thought to not be in their primary contextual situation.

Bank cuts to the west along Pammel Creek indicated that the midden extends for approximately 25 meters from the Drive In Road bridge. Large quantities of artifacts were also recovered from these excavations including a charred corn cob, Oneota ceramics, fish, bird, turtle, and mammal bone (including a bison scapula), and lithics.

A small test unit was also placed to the south of the 5 x 5 meter area adjacent to Pammel Creek Road. At a depth of 120 cm below the present surface, the prehistoric Oneota midden was encountered. This revealed that the midden extends at least as far as the road (nearly 20 meters) from the creek edge. Geomorphological coring confirmed, and allowed more accurate definition of the edge of this midden area.

To the west, a sandy rise with terrace like edges extends to the southwestern third of this portion of the project area. A 2 x 2 meter unit placed where the 1983 Bank Cut 10 was recovered additional artifacts, but found no features, or other significant deposits. Shovel testing, geomorphological coring, and three back hoe trenches on the sandy rise surface also indicated the presence of scattered prehistoric remains, but no features were detected.

The south and west edge of this sand rise was detected through the coring. A few prehistoric artifacts were recovered from the cores at the buried prehistoric surface which dipped to over 2 meters beneath the present surface. Two back hoe trenches followed the surface of the dipping sand rise to the lower prehistoric surface. In these trenches, a few prehistoric Oneota remains were located, but no significant deposits were identified.

In summary of the Phase II investigations at 47Lc176, the area near Drive In Road bridge contains an extremely significant, well preserved Oneota midden, which may also have been ridged for agricultural purposes. This midden overlies Woodland remains which appear to have been redeposited in a prehistoric stream channel. This area should qualify for nomination to the National Register of Historic Places. The remaining portion of the project area to the west and south as far as Ward Avenue contains a light scatter of Oneota remains which, in places are covered by over 2 meters of historic alluvium, and therefore, are probably little disturbed. However, no significant concentrations or features were located in extensive testing of that area.

Analysis of the recovered remains will proceed with basic description of the ceramic and lithic materials, and special floral and faunal analyses. Additional samples for radiocarbon dating of the 47Lc176 midden will also be submitted for assay.

Sincerely,

Robert F. Boszhardt
Field Director



Mississippi Valley Archaeology Center, Inc.

1725 State Street

• La Crosse, Wisconsin 54601

• (608) 785-8463

OFFICERS

President

Warren Loveland, Jr., President
Loveland Development Corporation

Vice President

James White, Director
La Crosse Public Library

Secretary-Treasurer

Martin Zanger, Professor
University of Wisconsin-La Crosse

EXECUTIVE DIRECTOR

James P. Gallagher, Associate Professor
University of Wisconsin-La Crosse

STAFF

Katherine Stevenson,
Regional Archaeologist

Robert F. Boszhardt,
Staff Archaeologist

BOARD OF DIRECTORS

Margaret Annett
La Crosse, WI

Kenneth Dahl, President
Dahl Ford Subaru

Philip Davy, President
Davy Engineering Company, Inc.

Daniel Gelatt, President
Northern Micrographics, Inc.

Michael Hartigan, Physician
Gundersen Clinic Ltd.

Edwin Hill, Director
Area Research Center,
University of Wisconsin-La Crosse

Jay Hoeschler, Vice President
Hoeschler Realty Corporation

Maureen Kinney, Attorney
Johns Flaherty & Gillette SC

Hope Kumm
La Crosse, WI

Frank Linder, General Manager
Dairyland Power Cooperative

Kenneth Lindner, Distinguished Professor
University of Wisconsin-La Crosse

Penny Murn
West Salem, WI

Clark Nixon, President
Bank of Galesville, Galesville, WI

Robert Obma, Physician
Skemp-Grandview-La Crosse Clinic, Ltd.

Narcelle Schneider, President
Piggy's Front Street Restaurant

Harry Schroeder, Vice President
HSR Associates, Inc.

Stuart Struever, Director
Center for American Archaeology,
Evanston, Illinois

James Terman, Physician
Gundersen Clinic, Ltd.

Thomas Trow, Archaeologist
Institute for Minnesota Archaeology,
Minneapolis, Minnesota

Robert Voight, Dean
University of Wisconsin-La Crosse

John Wabaunsee, Director
La Crosse Legal Services, Inc.

D. Fred Wendorf, Archaeologist
Southern Methodist University, Dallas, Texas

Ray Steventon
Radiocarbon Laboratory
Center for Climatic Research
Institute for Environmental Studies
University of Wisconsin-Madison
1225 West Dayton Street
Madison, Wisc. 53706

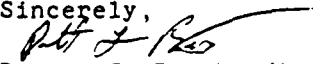
6/18/84

Dear Ray,

Enclosed is a charcoal sample from the State Road Coulee Site (47Lc176) in La Crosse County, Wisconsin. The site was dated last year to A.D. 1550 $\pm$ 60 (Wis 1584), and this sample is submitted for verification of the age of the Oneota midden. You will find one jar with a red tag (catalogue # 84.17.541) which is charcoal collected from the midden into a foil pouch, and water screened with tap water. This sample weighs about 2.7 g. If this is not enough for a date, you may combine this with the other two jars of charcoal. Both of those are from the same provenience (Level 5 of our control excavation unit 1); however, the charcoal in the other two vials (white tag) was water screened in Pammel Creek. Pammel Creek is a small spring fed stream, but has some agricultural and residential properties along its margins which offer the possibility of unknown contaminants. The samples were collected in April when I would imagine, agricultural contaminants would be low, but I am not sure of this.

Our lab director Bridget says she has sent you instructions on how to get to the Sand Lake Site. I trust you have received these, but enclose another map just in case. The site contains buried ridged agricultural fields which were sealed by an alluvial fan, and have been dated at your lab. Hope to see you there. We should have the ridges exposed in the next week or so, and throughout July.

Sincerely,


Robert F. Boszhardt



RADIOCARBON LABORATORY
CENTER FOR CLIMATIC RESEARCH

Institute for Environmental Studies
University of Wisconsin—Madison

1225 West Dayton Street
Madison, Wisconsin 53706

608-262-7328

DO NOT WRITE IN THESE BOXES

1)	WIS-		
	Sample No.	Name (locale or origin)	Priority & Serial No.
2)		$\pm$	B.P.
	Age	Error	$\delta^{13}\text{C}$ o/oo

PLEASE COMPLETE THE FOLLOWING: (use reverse side if more space needed)

3) Description of Sample

Substance of which sample is composed (giving scientific name where possible) -

Charcoal

Precise location of collection (including latitude and longitude to nearest minute, county and state/country) -

From Level 5 of Control excavation unit (2 x 2 meters) at 47Lc176 in La Crosse County, Wisconsin. 47°0'N, 91°12'0" W.

Occurrence and stratigraphic position in precise terms, including detailed description of the matrix -

Sample collected from Oneota midden which may include ridged agricultural fields. Sediments consist of organically enriched fine sands.

4) Date of collection - 4/20/84

Name of collector - Mills, Onsrud, Boszhardt

Name, address and organization of person submitting sample -

Same as below

Name, address and organization of person to be billed, or if other arrangements have been made, please explain -

Dr. James P. Gallagher

Mississippi Valley Archaeology Center

1725 State Street

La Crosse, Wisconsin 54601

5) Further explanation, including possible significance and cultural correlation (attach stratigraphic sketches, etc.) -

Assayed sample will verify age of Oneota midden and possible ridged fields in bottoms at the mouth of State Road Coulee. Earlier dated sample of A.D. 1550 $\pm$ 60 (Wis 1584) was collected from midden exposed in bank cut along Pammel Creek in 1983. This sample was collected immediately south of Wis 1584)

Expected or estimated age - 400-500 B.P.

6) Complete reference to relevant publications -

Boszhardt, Robert F. and James P. Gallagher

1984 Cultural Resources Investigation: Survey of Portions of the State Road and Ebner Coulee Flood Control Project La Crosse County, Wisconsin.

Mississippi Valley Archaeology Center Report of Investigation Number 11.

7) Description and significance of results as you would like it to appear in Radiocarbon.


Signature

6/18/84
date

WIS-1584.

400 $\pm$ 60

= -9.96

Charred corn kernels coll Aug 1983 from State Road Coulee Site, LaCrosse Co (43°47'N, 91°12'30"W) by R F Boszhardt, subm by J B Gallagher. Sample from Zone E of Bank Cut 1 profile, an undisturbed Oneota ridged field, 1m below surface. Layer also produced ceramic sherds, flakes, bone, charcoal and shell (Boszhardt and Gallagher, 1983).

TYPE OF SITE:

Mounds ☐ Village ☐ Campsite ☐ Garden Beds ☐
 Petroglyphs ☐ Worksite ☐ Cemetery ☐ Cache ☐
 Quarry ☐ Cave or Rockshelter ☐ Other: Midden

CODE NUMBER

Name of site	County	Township and range	Location in section	Present owner
State Road Coulee II	La Crosse	Shelby T15N, R7W	NW1, SE1, SW1 Sec. 10	Town of Shelby
Reported by: M.V.A.C.	Date 6/84			
Geographical Location Between Pammel Creek (N) and Pammel Creek Road (S). 120 meters east of Drive In Road (bridge).				

DESCRIPTION OF SITE:

An apparent Oneota midden exposed in bank cut along Pammel Creek. Midden in dark sandy silt sealed beneath 35 cm of historic alluvium. Site appears simillar to, though not as dense as 47Lc176. Separated from 47Lc176 by low terrace which is also mantled by historic Alluvium.

CULTURE: Oneota

REFERENCES:

Boszhardt et. al.

1984/85 Cultural Resources report fro the St. Paul District Corps of Engineers.

SPECIMENS FROM SITE M.V.A.C. Reports of Investigations

IN POSSESSION OF:

Mississippi Valley Archaeology Center (La Crosse.)

REMARKS:

Wisconsin Archeologist Series Vol. No. Page

WISCONSIN ARCHEOLOGICAL CODIFICATION FILE

Dear Ernie,

Your State Road Coulee II site is LC 191. I checked your map and refined the location to Center of NW $\frac{1}{4}$, NW $\frac{1}{4}$, SE $\frac{1}{4}$, SW $\frac{1}{4}$ - hope this is o.k.

Yes, I will see you at Aztlan Day.

A handwritten signature in cursive script, appearing to read "Juan".

June 20, 1984

Mr. Leonard Blake
Box 1114
Department of Anthropology
Washington University
St. Louis, MO 63130

Dear Mr. Blake:

Last year you undertook floral analyses from two Oneota sites (Pumell Creek 47Lw61 and State Road Coulee 47Lc176) here in La Crosse. We have received a radiocarbon date from a sample of corn from the State Road Coulee site which is A.D. 1550 ± 60 (Wis 1584).

This spring we returned to the State Road Coulee site for further investigations. I thought you might be interested in the quality of cultigam remains recovered. From each 10cm level of 2 x 2 meter units extended into the Oneota midden we recovered a considerable amount of corn and beans. For example, from level 5 we recovered over 1,000 whole, charred kernels of corn and 100 beans.

As you pointed out in your analysis last year, the kernels are removed from the cob. I am stumped as to interpreting the reason for such a high number of charred cultigam remains from one level of a control unit. Do you know of comparable situations? And/or could you offer some insight as to explaining this situation?

You mentioned at one time that you have a personal interest in seeing as much as possible of prehistoric and early historic cultivated plant remains from the eastern U.S. If you would like to look at the materials from State Road, please inform me, and I will send them down. We also removed most of a corn cob and smaller cob fragments as well as some cupules.

Sincerely,

Robert 'Ernie' Boszhardt
Staff Archaeologist

July 12, 1984

Mr. Robert F. Boszhardt, Staff Archaeologist
Mississippi Valley Archaeology Center, Inc.
1725 State Street
LaCrosse, Wisc. 54601

Dear Robert,

Thank you for your letter of June 20th. I have just returned from an out-of-town visit, hence the delay in replying. recent excavations at

Yes, I would like to see the corn and beans, (and all other plant remains recovered, if you prefer) from the State Road Coulee site (47Lc176), and will appreciate it very much if you can send them to me. You will be glad to know that some wild rice has been obtained for our comparative collection from a food store so that we should be able to spot it if it again turns up.

We have seen corn from several burned Mississippian houses which consisted almost entirely of kernels. We know that the kernels were on the cob at the time they were burned because impressions from the adjoining kernels could be seen. One such house in Missouri, near St. Louis, literally, had several bushels of kernels and only about thirty measurable cob fragments. It appears probable that the kernels charred and insulated most of the cobs, which decayed.

It seems possible that a cache of shelled corn could be burnt accidentally; in which case the kernels would swell and have no impressions on their sides. There is also a possibility that corn burned and was discarded in the process of roasting or parching. Gilbert L. Wilson's "Agriculture of the Hidatsa Indians", Univ. of Minnesota Studies in Social Sciences, No. 9, Minneapolis, 1917, pp. 37, 38, 41, 64 describe the processes used by the Hidatsa. This publication was reprinted in 1977 by the J. & L. Reprint Co., Lincoln, Neb.

Thanks for thinking of me.

Sincerely,

Leonard

Leonard W. Blake

Box 1114, Dept. Anthropology
Washington Univ.
St. Louis, Mo. 63130

Mr. Leonard Blake
P.O. Box 114
Department of Anthropology
Washington University
St. Louis Mo. 63130

8/6/84

Dear Mr. Blake,

Thank you for your positive response regarding our offer for you to look at the cultigen remains from our Phase II excavations at State Road Coulee (47Lc176). This package contains the cultigen remains. One of staff members is taking care of the native plants, but if you wish to see those at a latter date, I can send them, or the report. Also enclosed is one vial with bean and corn remains from a feature at the North Shore Site (47Lc185).

The report for the State Road Coulee Site work is due at the end of September. So if you make any pertinent observations with these materials, and can relay that information back by that time, it would be greatly appreciated.

I have been delayed in sending this to you due to field work at the Sand Lake Site, where we have located buried and preserved Oneota ridged fields. (I will send a copy of our report on our 1982 excavations at Sand Lake in a separate mailing). This year we have uncovered the ridges in 25 back hoe trenches to try to define the extent and orientation of the fields. Associated remains include Bison scapula hoes, other bone, shell, pottery, lithics, and charred floral remains (including a cluster of 4 or 5 cobs).

Thank you once again for your time and interest in our floral remains. I anxiously await word on what you may see in all of this.

Sincerely,

Robert F. Boszhardt

August 11, 1984

Mr. Robert F. Boszhardt, Staff Archaeologist
Mississippi Valley Archaeological Center, Inc.
1725 State St.
LaCrosse, Wisconsin 54601

Dear Robert,

This is just a note to let you know that the plant remains from Phase II State Road Coulee site arrived in good condition and to thank you for Reports of Investigations No.8.

Sincerely,

Leonard

Leonard W. Blake

Box 1114, Dept. Anthropology
Washington Univ.
St. Louis, Mo. 63130

September 12, 1984

Mr. Robert F. Boszhardt, Staff Archaeologist
Mississippi Valley Archaeological Center, Inc.
1725 State Street
LaCrosse, Wisconsin 54601

Dear Robert,

Enclosed are measurements on corn and beans from the State Road Coulee site (47Lc176), which you sent last August.

Corn kernels, with one exception, appear to have been charred off the cob and were bloated to a greater or lesser extent. All that were measured were height (length) as well as width could be obtained were wider than high as is characteristic of the Eastern Eight Row race of corn. Presence of this race was also confirmed by the large cupules from 8 and 10-rowed ears from Gully No.1 and by the kernel from an 8-rowed ear from the East Profile, Zone B2. Actual cobs were probably somewhat larger than indicated by the carbonized cob fragments as cobs shrink and estimated 15 to 25% in charring. Other collections of corn from Oneota sites in Wisconsin and northern Illinois are predominantly of this race. The small cupule from a 12-rowed ear in Level 6 (Lot #270) was something of a surprise although 12-rowed popcorn was recovered from the 18th Century Marina site on Madeline Island in Lake Superior.

The width of measured corn kernels in this collection from 47Lc176 ranged from 6.0 mm. to 12.6 mm. with a median of 9.1 mm. 65% of the measured sample was between 8.5 and 9.9 mm., inclusive.

The collection contained 8 measurable whole beans, some with the skin burnt off and 29 measurable halves. Lengths ranged from 6.9 to 11.6 mm. with a median of 9.1 mm., and widths from 4.3 to 6.2 mm., median 5.4 mm. L/W of medians was 1.69. Comparative measurements can only give a rough idea as our experiments have shown that beans have varying rates of shrinkage when carbonized. The attached comparison may be of some interest, however.

Thanks for the chance to see this material. Your specimens will be returned this week or early next week by first class mail. Please reimburse me for the cost of postage.

Box 1114, Dept Anthropology
Washington University
St. Louis, Mo. 63130

Enclosures

Sincerely,

Leonard

Leonard W. Blake

CARBONIZED

1.

State Road Coulee Site (47Lc176) Received from Robert F. Boszhardt
August, 1984. Note: All corn kernels carbonized off the cob unless

Vial	L.2, Lot # 234.	Wt. in Grams
1	Four corn kernels 9.2, 9.7, 10.0 and 10.2 mm wide. charred off the cob.	0.45
2	Broken corn kernels, one 9.0 mm. wide	0.34
3	Unmeasurable corn kernel fragments	0.33
4	Unmeasurable corn kernel fragments	0.47

Bottle Gully #1., 84-57-01 Lot #238

One closed cupule from 8-rowed ear, 10.6 mm. wide. Also another smaller, more open cupule 7.1 mm. wide and broken, unmeasurable cupule and glumes.	0.19
One tip end of cob from 10-rowed ear, 5 cm. long, kernel thickness 3.6 mm., cupule width 7.8 mm. This is possibly the cob from which the smaller cupule above came.	2.87
Three corn kernels, one is 9.8 mm. wide by 6.0 mm. high. The other two are too broken to measure	0.28
Pieces of corn shuck	0.13
One bean (<i>Phaseolus vulgaris</i>) 11.6 mm long by 5.2 mm. wide, by 5.2 mm. thick. Also one half bean 8+mm by 4.6mm., broken.	0.16
One small piece of hickory nut shell (<i>Carya</i> sp.)	0.04

Bottle Level 3, Lot #245 (Control Unit)

Three measurable corn kernels, 6.7 mm. wide, 9.5 mm. wide by 6.6 mm. high and 9.6 mm. wide and broken, unmeasurable corn kernels	0.84
--	------

Vials, Level 4, Lot #257.

1 One corn kernel 9.3 mm. wide and four pieces of kernels	0.31
---	------

Bottle 84-17-537A Level 5, Lot #261.

100 measurable kernels of which 21 were measured	13.51
7.6 mm. wide by 4.7 mm. high, 7.7 mm. wide, 7.7 mm., 8.3 mm., 8.4 mm., 8.4 mm., 8.5 mm., 8.5 mm. by 5.7 mm., 8.8 mm., 9.0 mm., 9.0 mm., 9.0 mm., 9.0 mm. by 6.2 mm., 9.1 mm. 9.3 mm., 9.3 mm., 9.6 mm., 9.7 mm., 9.8 mm. and 11.0 mm.	

Bottle 84-17, Level 5, Lot #261.

Broken corn kernels	7.33
One piece of hickory nut shell (<i>Carya</i> sp)	0.04

Bottle 84-19-537B Level 5, Lot #260.

33 measurable kernels, eight measured	6.47
8.0 mm. wide, 8.3 mm., 8.5 mm. by 5.8 mm., 9.0 mm. by 6.3 mm., 9.1 mm., 9.3 mm., 9.8 mm. and 9.9 mm.	
Two halves of beans 10.4 mm long by 6.5 mm. wide and 9.3 mm. by 5.6 mm.	0.08
Wood charcoal	0.82

CARBONIZED

State Road Coulee Site (47Lc176) Received August 1984

2. 1
Wt. in
Grams

Bottle 84-17-537C. Level 5 Lot #260.

Corn kernels, eight measurable, the rest unmeasurable,
8.6 mm. wide by 7.0 mm. high, 9.0 mm. by 6.7 mm., 9.0 mm.,
9.2 mm., 9.2 mm. by 7.7 mm., 9.2 mm., 9.4 mm., 11.8 mm. by 8.3 mm.
Six unmeasurable pieces of bean
Wood charcoal
One piece of non-botanical bone.

6.48
6.43
0.55
1.37

Bottle (1) 84-17-537E, Level 5, no lot number.

Approximately 120 corn kernels. 20 kernels selected at random and
each other one or 10 were measured. 8.7 mm. by 6.7 mm., 9.0 mm.
by 8.5 mm., 9.0 mm. 9.7 mm., 10.1 mm., 10.5 mm. 10.7 mm. by 7.2 mm.,
10.8 mm., 11.0 mm., by 8.0 mm, 12.6 mm., by 6.5 mm.

21.69

Small Bottle (2) 84-17-537E Level 5 No lot number.

Corn kernel fragments

0.92

Bottle 84-17-537F Level 5 No lot number.

Approximately 170 corn kernels.

16.80

20 kernels selected at random and every other one, that is
10 were measured. 7.0 mm. wide, 8.1 mm. wide by 7.3 mm. high,
8.4 mm. by 7.4 mm., 8.4 mm., 8.7 mm. by 5.8 mm., 8.9 mm., 9.0 mm., 10.3 mm.,
10.6 mm. by 7.8 mm, and 11.5 mm.

Bottle 84-17-537F Level 5 No lot number.

Corn kernel fragments

6.74

Bottle 84-17-537F Level 5 No lot number. Beans

One whole bean 11.6 mm. long by 5.2 mm. wide by 5.2 mm. thick.
Eleven half beans: 8.3 mm. long by 4.7 mm. wide., 8.9 mm. by 5.1 mm.,
9.0 mm. by 5.1 mm., 9.1 mm., by 5.8 mm., 9.2 mm. by 5.2 mm.,
9.3 mm. by 6.0 mm., 9.5 mm. by 5.9 mm., 9.0 mm. by 5.9 mm.,
9.8 mm. by 5.8 mm., 10.3 by 6.0 mm., 10.9 mm. by 6.2 mm.
Plus 14 broken halves.

1.25

Bottle Level 5 Lot #258.

Corn kernel fragments

5.80

Small Vial 84-17-537E Level 5 No lot number. Beans

Six halves of beans: 8.0 mm. long by 4.6 mm. wide,
8.8 mm. by 5.0 mm., 9.1 mm., by 5.3 mm., 9.6 mm. by 6.0 mm.,
10.0 mm. by 5.4 mm., 10.1 mm. by 5.6 mm. Plus 4 broken halves

0.56

Bottle 84-20-451 Level 6 Lot #268.

1 of 3

Corn kernels, mostly broken. Five were measured. They were:
9.1 mm. wide by 6.5 mm. high, 9.2 mm. wide, 10.2 mm., 10.5 mm.
and 10.5 mm.

7.92

One bean 10.2 mm. long by 5.9 mm. wide by 4.3 mm. thick;
two half beans 9.6 mm. by 5.0 mm. and 8.0 mm. by 4.3 mm. and
one broken half.

0.30

Three pieces of hickory nut shell (Carya sp)

0.13

Wood charcoal

1.2

CARBONIZED

State Road Coulee Site (47Lc176) Received August 1984

3.
Wt. in
GramsBottle 84-20-447 Level 6 Lot #269.2 of 3

Corn kernels. Five were measured.

6.0 mm. wide, 9.0 mm. wide by 6.8 mm. high,, 9.0 mm. wide and 9.4 mm. 7.3

Four half beans 8.1 mm. by 4.3 mm., 9.0 mm. by 5.8 mm.,

9.1 mm. by 5.5 mm., 10.4 mm. by 5.5 mm. pluss 11 broken pieces

0.64

Wood charcoal

0.54

Bottle 84-20-448 Level 6 Lot #269.3 of 3

Corn kernels. Ten were measured. 8.9 mm. wide, 8.9 mm., 9.3 mm.,

9.3 mm., 9.3 mm. wide by 5.8 mm. high, 9.5 mm. wide, 9.6 mm.,

9.7 mm., 9.7 mm., 10.2 mm.

6.54

Two whole beans, 9.9 mm. long by 5.6 mm. wide by 4.1 mm. thick,

10.7 mm. by 6.2 mm. by 3.4 mm. plus pieces of broken, unmeasurable
beans.

0.68

Wood charcoal

0.94

Four small unidentified fragments.

Bottle Level 6 Lot #270.

Corn kernels, mostly broken. Five were measured. 8.5 mm. wide,

9.0 mm., 9.8 mm. wide by 6.7 mm. high, 9.8 mm. by 7.2 mm., 10.4 mm. wide.

2.72

Small Vial Level 6 Lot #270

Two small corn cob cupules, both open. One was measurable,

it was from a 12-rowed ear, cupule width 5.0 mm, possibly popcorn.

Bottle 84-23-01 Level 7 Lot #274.

Corn kernels. Ten were measured. 7.1 mm. wide, 8.5 mm., 8.9 mm.,

9.0 mm., 9.0 mm., 9.1 mm., 9.3 mm., 9.7 mm., 9.7 mm., 10.2 mm.

5.68

Two whole beans, 8.4 mm. by 5.3 mm. by 3.8 mm. and 9.1 mm. by

5.0 mm. by 4.4 mm.; two half beans 8.8 mm. by 4.8 mm. 8.8 mm.

by 5.5 mm. and two broken pieces of bean

0.35

Three pieces of hickory nut shell

0.28

Wood charcoal

2.24

Three unidentified fragments

Vial 84-17-536-537

One half bean 9.2 mm. long by 5.0 mm. wide and one broken

half of a bean 5.4 mm. wide

0.14

Vial 1 East Wall Profile Zone B2 Lot #499.

Four corn kernels 7.6 mm. wide, 7.7 mm., 8.2 mm., 10.3 mm.

0.38

Vial 2 Five corn kernels. One appears to have been charred

on the cob. It is from a 8-rowed ear, is 9.0 mm. wide and 4.4 mm. th.

0.39

Vial 3 Corn kernel fragments

0.38

Vial 4 Two very small fragments of bean

< 0.01

CARBONIZED

47Lc185 received from Robert F. Boszhardt August 1984.

1.
Wt. in Grams

Bottle Tp2 F-1, Level 1 Lot #989,990.

Fragments of corn kernels

0.23

Halves of beans and bean fragments, 8.9 mm., by 5.7 mm.,

9.3 mm. by 4.6 mm., 9.8 mm. by 5.3 mm., 10.0 mm. by 5.8 mm.,

9.3 mm. by 5.6 mm.

0.28

Small pieces of wood charcoal

0.02

One charred clay ball, non-botanical and unidentified carbonized fragment.

BEANS FROM STATE ROAD COULEE SITE (47Lc176) COMPARED WITH THOSE FROM OTHER SITES
(All specimens are carbonized and not adjusted for shrinkage. Many are halves of beans.)

<u>Site and State</u>	<u>Excavator</u>	<u>Culture</u>	<u>Est. Date</u> (A.D.)	<u>Specimens Measured</u>	<u>Range in L/W.</u> <u>Length</u> <u>Width</u>	<u>Median Length</u>	<u>Median Width</u>	<u>Ratio L/W</u>
MISSOURI 23Sa2	U. of Mo. Field School	Oneota Historic Missouri	1600-1714	125	15.2-8.0 9.6-3.6	11.6	6.2	1.84
ILLINOIS Zimmerman	M.K. Brown	Historic Kaskaskia	1683-1691	38	12.3-7.2 7.6-3.3	9.5	5.0	1.90
WISCONSIN 47Lc176	R.F. Boszhardt	Oneota	1550±60	39	11.6-6.9 6.2-4.3	9.1	5.4	1.69
MISSOURI 23Mi71	R.B. Lewis	Mississippian	1400-1600	24	10.1-7.3 5.9-4.4	9.2	5.2	1.77

In the central and eastern states, most of the earliest corn has small cobs and cupules, and about twelve rows of grains. We call this race North American Pop. It has evolved from early, hard, and small southern corn and has sometimes been called Tropical Flint or Reventador. Some of this ancient kind of corn is still grown by a few modern Indians.

Eastern Eight-Row, first described as Northern Flint, derived from eight-rowed forms of the Southwest and Mexico. It reached Ontario, Canada, before A.D. 800, but there are suggestions of Eastern Eight Row in some Hopewell collections. By A.D. 1200 Eight Row dominated most of the region east of the Mississippi and by A.D. 1500 covered most of the region to the Rockies. Today Eastern Eight Row continues to be important because crosses of it with dent corn produced the Corn Belt Dent upon which most commercial corn production in North America is based.

Intermediate to North American Pop and the Eastern Eight Row is Midwest Twelve Row. It is similar to the Pima-Papago corn race of the Southwest and persisted longest in parts of the central and lower Mississippi River Valley. By A.D. 1500 it had largely disappeared but left its mark in the common ten- and twelve-rowed variants of Eastern Eight Row which are grown in the Plains area, especially towards the south.

A remarkable feature is the scarcity of corn after Hopewell times until A.D. 900 or 1000. This could indicate gaps in collections or an actual scarcity of corn agriculture during this period. Descendants of the early small-cobbed and many-rowed corn are still being grown in many places as hard flints or pop corns, but by about A.D. 1200 most corn east of the Rockies was eight-rowed.

Outler, Hugh C. and Leonard M. Blake
1976 Plants from Archaeological Sites East of the Rockies. American Archaeology
Reports No.1, Microfiche, Amer. Archaeology Div., Univ. of Missouri-Columbia

September 26, 1964

Mr. Leonard Blake
Box 1114
Department of Anthropology
Washington University
St. Louis, MO 63130

Dear Mr. Blake:

Your letter and the floral remains arrived recently. Thank you for all of your efforts. I enclose a check for \$5.00 which should cover the cost of postage for both the letter and package.

We have received a second set from the State Road Coulee site (47Lo176). The sample of charcoal assayed at 420 ± 70 B.P. (A.D. 1617). The earlier date on corn was 100 ± 70 B.P. (A.D. 1934). The draft report on this work is due November 15, and I will send you a copy.

Sincerely,

Robert F. Boshardt
Staff Archaeologist

RFB:mm

enc.

September 26, 1984

Mr. Tom Bailey
2302 Blaisdell Ave. South
Minneapolis, MN 55404

Dear Tom:

Here is a copy of Blake's letter and data of State Road Coulee flora. As I mentioned over the phone, the report deadline has been extended one month to November 15. Given the revised scheduling, I should need your section by the end of October at the absolute latest--preferably by the 15th or so. Please inform me if this will be a problem.

I have also enclosed a copy of the review comments for our Sand Lake Pollen article. We can go over the manuscript when you visit next week. Please note Bill Green's request for a Jim Huber report.

Hope all is well there. Look forward to your visit the fifth and sixth.

Sincerely,

Robert F. Boszhardt
Staff Archaeologist

RFB:mm

encs.



Mississippi Valley Archaeology Center, Inc.

1725 State Street • La Crosse, Wisconsin 54601 • (608) 785-8463

February 1, 1985

OFFICERS

President

Warren Loveland, Jr., President
Loveland Development Corporation

Vice President

James White, Director
La Crosse Public Library

Secretary-Treasurer

Martin Zanger, Professor
University of Wisconsin-La Crosse

EXECUTIVE DIRECTOR

James P. Gallagher, Associate Professor
University of Wisconsin-La Crosse

STAFF

Katherine Stevenson,
Regional Archaeologist

Robert F. Boszhardt,
Staff Archaeologist

BOARD OF DIRECTORS

Margaret Annett
La Crosse, WI

Kenneth Dahl, President
Dahl Ford Subaru

Philip Davv, President
Davv Engineering Company, Inc.

Daniel Gelatt, President
Northern Micrographics, Inc.

Michael Hartigan, Physician
Gundersen Clinic Ltd.

Edwin Hill, Director
Area Research Center,
University of Wisconsin-La Crosse

Jay Hoeschler, Vice President
Hoeschler Realty Corporation

Maureen Kinney, Attorney
Johns Flaherty & Gillette SC

Hope Kumm
La Crosse, WI

Frank Linder, General Manager
Dairyland Power Cooperative

Kenneth Lindner, Distinguished Professor
University of Wisconsin-La Crosse

Penny Murn
West Salem, WI

Clark Nixon, President
Bank of Galesville, Galesville, WI

Robert Obma, Physician
Skemp-Grandview-La Crosse Clinic Ltd.

Narcelle Schneider, President
Piggy's Front Street Restaurant

Harry Schroeder, Vice President
HSR Associates, Inc.

Stuart Struever, Director
Center for American Archaeology,
Evanston, Illinois

James Terman, Physician
Gundersen Clinic, Ltd.

Thomas Trow, Archaeologist
Institute for Minnesota Archaeology,
Minneapolis, Minnesota

Robert Voight, Dean
University of Wisconsin-La Crosse

John Wabaunsee, Director
La Crosse Legal Services, Inc.

D. Fred Wendorf, Archaeologist
Southern Methodist University, Dallas, Texas

Mr. Leonard Blake
Box 1114
Dept. of Anthropology
Washington University
St. Louis, MO 63130

Dear Mr. Blake,

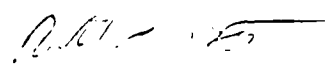
Last year you undertook an analysis of the floral remains from the State Road Coulee Site (47Lc176) here in La Crosse for us. The assemblage included newly 2,000 corn kernels which you determined, with one exception, as having been charred off the cob. Recently I have been considering the possible implications of this finding in regards to growing season and food preparation by the Oneota farmers.

It would seem by the completeness of the corn kernels, that they were removed ("shelled") from the cob when dry. I presume that shelling green corn would extensively damage the basal portion of most kernels. If this is the case, then I am thinking that the State Road corn was allowed to mature completely in the fields, and thus indicate a stable growing season in this region for Eastern Eight Row Corn. That is to say, the corn was not harvested "green" out of necessity due to a short (less than 120 day) growing season.

However, in reading ethnographies of North American Corn Growers, the numerous variations of preparing corn include harvesting the corn "green" and then drying it by baking, roasting, or simply using sunlight. Thus, the corn could be harvested earlier (i.e. in the "green" stage) and dried to be shelled and finally charred such as at State Road Coulee. You also noted that the State Road Site kernels were bloated to varying degrees, which suggests some moisture content within the kernels as they were burned. Or could this be from boiling and then burning?

I write you now to see if you know of any way to distinguish the very different possible harvest times and food preparation methods for corn kernels from the State Road Coulee Site or other sites. As I mentioned earlier this would have all sorts of interpretive implications regarding seasonality of planting and harvesting the Oneota ridged fields we have located here.

Sincerely,


Robert Boszhardt

P.S. Also enclosed is a draft copy of the State Road Coulee Report which I promised you last September.

Feb.12,1985

Mr. Robert Boszhart
Staff Archaeologist
Mississippi Valley Archaeology Center, Inc.
1725 State St.
LaCrosse, Wisc. 54601

Dear Mr. Boszhart,

Thank you very much for the draft copy of the
State Road Coulee Report, which is appreciated.

I am unable to answer the questions put forth in
your letter of Feb.1st, because of lack of knowledge. Corn kernels
charred off the cob invariably "bloat". I do not know whether it is
moisture content or whether it is because the soft starch in the
interior. I suppose it would be possible for someone to do experiments
with corn kernels, carbonizing flint corn, flour corn, partly dried
and very dry corn at different temperatures to observe the results,
but as far as I know this has not been attempted. The lower part
of the embryo is usually missing from carbonized kernels, possibly
because of the oil content. On some sites detached embryos occur
with some frequency. It may be speculated that this may have something
to do with the way kernels were processed in connection with
making hominy, for example, or some other product.

I note on page 79 the following statement:
"Corn has been present in the Midwest since ca.2000 B.P (Munson 1973)".
Although Cutler and I examined corn from Meadowcroft and from an
Adena mound in Ohio that C14 dates before 2000 B.P., according
to information furnished by the excavators, some now doubt that
it was present before A.D.300-400. We were recently disconcerted
by a recent date by the Accelerator Radiocarbon method on a small
corn sample which showed a much later date than a wood charcoal
date from a pit that the excavator claimed was Hopewell.
The dating was done by the Nuclear Structure Research Laboratory - 81
of the University of Rochester. The report, dated June 1983, by
N. Conard, Asch and Asch etc, is "Prehistoric Horticulture in Illinois:
Accelerator Radiocarbon Dating of the Evidence."

Box 1114, Dept of Anthropology
Washington University
St. Louis, Mo. 63130

Sincerely,

Leonard Blake
Leonard W. Blake

25.1.85
W.F.

25.1.85
W.F.



DEPARTMENT OF THE ARMY
ST PAUL DISTRICT CORPS OF ENGINEERS
1135 U S POST OFFICE & CUSTOM HOUSE
ST PAUL MINNESOTA 55101

REPLY TO
ATTENTION OF:

March 5, 1985

Environmental Resources Branch
Planning Division

Mr. Robert Boszhardt
Mississippi River Valley Archeology Center
1725 State Street
La Crosse, Wisconsin 54601

Dear Mr. Boszhardt:

Enclosed are the comments of the St. Paul District, the Wisconsin State Historic Preservation Officer, and the National Park Service on your report, Additional Cultural Resources Investigations at Selected Portions of the State Road Coulee - Pammel Creek Flood Control Project at La Crosse, Wisconsin, prepared under contract number DACW37-84-M-0622.

The report made interesting reading and is a good example of what may be expected from urban archeology in the Upper Midwest.

Our biggest concern with the report is summarized in comment number 4. Please call Mr. David Berwick of my staff, at (612) 725-7854, to discuss this problem and how it may be resolved.

Sincerely,

A handwritten signature in dark ink, appearing to read "Wayne A. Knott", is written over the typed name.

Wayne A. Knott
Chief, Environmental Resources Branch
Planning Division

Enclosure

ST. PAUL DISTRICT COMMENTS ON A
REPORT ENTITLED ADDITIONAL CULTURAL
RESOURCES INVESTIGATIONS AT SELECTED
PORTIONS OF THE STATE ROAD COULEE -
PAMMEL CREEK FLOOD CONTROL PROJECT
AT LA CROSSE, WISCONSIN
(Contract Number DACW37-84-M-0622)

1. Minor editorial and typographical corrections need to be made to the text. Careful review should find these errors, many of which are found in Appendix A (example, p. 90, second paragraph, sentence beginning "Soil colors reported herein ..." does not make sense).
2. Page 32 clearly state one of the goals of testing 47LC176 is to determine whether ridged agricultural fields are present. Yet, throughout the report, mention of the ridged fields is always prefixed by the word "possible." While we realize the difficulty in identifying these ridges with precision, it would be nice to see a statement somewhere in the report (in the section discussing results of midden testing and again in the summary) that clearly states the author's position, such as "Because of the nature of the midden in the limited test areas, it is not possible to state definitively that the features noted are in fact ridged fields."
3. Page 7 states that sediments in Project Area I consist of alluvial silts "deposited since no earlier than ca. AD 1850." How was this determined? Did Beattis and Thompson look at Area I?
4. Project Area II (page 7) does not correspond to the survey area called for in Section 4.02 of the scope of work. The survey should have been carried northeast of Hagen Road (approximately 2,650 feet upstream from 47LC176). From the discussion of the upstream cut banks and their 30-meter intervals, this upstream work appears to have been carried only 1,280 feet upstream of the Drive In Road bridge, slightly less than half the required distance. Why were the cut banks not carried the full 2,650 feet upstream?
5. The first sentence of the lithics section (page 47) sounds as if what is characteristics of Oneota assemblages is that relatively few stone tools are recovered. In this what was meant? If not, you could say "although relatively few stone tools were recovered, they are characteristic ...".



HISTORIC PRESERVATION DIVISION

January 15, 1985

Mr. Wayne A. Knott
Chief, Environmental Resources Branch
St. Paul District, Corps of Engineers
1135 U.S. Post Office and Custom House
St. Paul, Minnesota 55101

SHSW: #374-82
RE: State Road Coulee
Flood Control

Dear Mr. Knott:

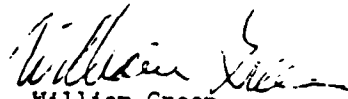
We have reviewed the draft report entitled "Additional Cultural Resources Investigations at Selected Portions of the State Road Coulee - Pammel Creek Flood Control Project at La Crosse, Wisconsin" by Robert F. Boszhardt, et. al.

This report indicates that archeological site 47-Lc-176 is eligible for inclusion in the National Register of Historic Places. Also, it shows that archeological site 47-Lc-191 may be eligible for the National Register and should be evaluated to determine whether this is the case. We agree with this recommendation.

As I discussed with Dave Berwick of your staff, several areas of high archeological potential remain to be surveyed along the channel in areas that will be affected by this project. Investigation techniques along the channelized north-south segment may include coring or augering to sample the undisturbed deposits which apparently exist beneath the levees and in some cases beneath the channel.

Our comments on the draft memorandum of agreement for this project will be forwarded shortly. Please contact me (608) 262-2970 if you have any questions on these subjects.

Sincerely,


William Green
Staff Archeologist

WG:1kr

cc: James P. Gallagher

THE STATE HISTORICAL SOCIETY OF WISCONSIN

816 STATE STREET · MADISON, WISCONSIN 53706 RICHARD A. ERNEY, DIRECTOR



United States Department of the Interior
NATIONAL PARK SERVICE

ROCKY MOUNTAIN REGIONAL OFFICE

655 Parfet Street

P.O. Box 25287

Denver, Colorado 80225

IN REPLY REFER TO:

H2415 (RMR-PR)

JAN 11 1985

Mr. Wayne A. Knott
Chief, Environmental Resources Branch
Planning Division
Attention: Mr. David Berwick
Department of the Army
St. Paul District, Corps of Engineers
1135 U. S. Post Office & Custom House
St. Paul, Minnesota 55101

Dear Mr. Knott:

We are returning the draft report entitled, "Additional Cultural Resources Investigations at Selected Portions of the State Road Coulee - Pammel Creek Flood Control Project at La Crosse, Wisconsin."

We regret that our current workload does not permit a useful review of this report within your requested time limit.

Sincerely,

Jack R Rudy, Chief
Branch of Interagency Archeological Services

Enclosure

APPENDIX C
FIELD RECORDS

Appendix C is deleted in this report
because of illegibility.
Per Ms. Jean Schmidt, U. S. Army Engineer
District, St. Paul

Surf	Normal	Crack	End
50 ft	2 m	-	High
Bridge	Back	ends	
1 m wide	at	end	End
Bridge	30 m	100 ft	
Hole 1	30 m	100 ft	
Hole 2	30 m	100 ft	
Hole 3	30 m	100 ft	
Hole 4	120 m	100 ft	
Hole 5	150 m	100 ft	
at 100 m	100 ft	100 ft	
15	100 ft	100 ft	
possible	100 ft	100 ft	
for mill	100 ft	100 ft	
Hole 1	30 m	100 ft	
Hole 2	30 m	100 ft	
Hole 3	30 m	100 ft	
Hole 4	120 m	100 ft	
Hole 5	150 m	100 ft	
at 100 m	100 ft	100 ft	
15	100 ft	100 ft	
possible	100 ft	100 ft	
for mill	100 ft	100 ft	
Hole 1	30 m	100 ft	
Hole 2	30 m	100 ft	
Hole 3	30 m	100 ft	
Hole 4	120 m	100 ft	
Hole 5	150 m	100 ft	
at 100 m	100 ft	100 ft	
15	100 ft	100 ft	
possible	100 ft	100 ft	
for mill	100 ft	100 ft	

Hole	Post	Notes
Hole 1	Post 1	0-45 cm 1st allusion
Hole 2	Post 2	45-125 = 130 cm 1st allusion
Hole 3	Post 3	125-150 = 130 cm 1st allusion
Hole 4	Post 4	150-175 = 130 cm 1st allusion
Hole 5	Post 5	175-200 = 130 cm 1st allusion
Hole 6	Post 6	200-225 = 130 cm 1st allusion
Hole 7	Post 7	225-250 = 130 cm 1st allusion
Hole 8	Post 8	250-275 = 130 cm 1st allusion
Hole 9	Post 9	275-300 = 130 cm 1st allusion
Hole 10	Post 10	300-325 = 130 cm 1st allusion
Hole 11	Post 11	325-350 = 130 cm 1st allusion
Hole 12	Post 12	350-375 = 130 cm 1st allusion
Hole 13	Post 13	375-400 = 130 cm 1st allusion
Hole 14	Post 14	400-425 = 130 cm 1st allusion
Hole 15	Post 15	425-450 = 130 cm 1st allusion
Hole 16	Post 16	450-475 = 130 cm 1st allusion
Hole 17	Post 17	475-500 = 130 cm 1st allusion
Hole 18	Post 18	500-525 = 130 cm 1st allusion
Hole 19	Post 19	525-550 = 130 cm 1st allusion
Hole 20	Post 20	550-575 = 130 cm 1st allusion
Hole 21	Post 21	575-600 = 130 cm 1st allusion
Hole 22	Post 22	600-625 = 130 cm 1st allusion
Hole 23	Post 23	625-650 = 130 cm 1st allusion
Hole 24	Post 24	650-675 = 130 cm 1st allusion
Hole 25	Post 25	675-700 = 130 cm 1st allusion
Hole 26	Post 26	700-725 = 130 cm 1st allusion
Hole 27	Post 27	725-750 = 130 cm 1st allusion
Hole 28	Post 28	750-775 = 130 cm 1st allusion
Hole 29	Post 29	775-800 = 130 cm 1st allusion
Hole 30	Post 30	800-825 = 130 cm 1st allusion
Hole 31	Post 31	825-850 = 130 cm 1st allusion
Hole 32	Post 32	850-875 = 130 cm 1st allusion
Hole 33	Post 33	875-900 = 130 cm 1st allusion
Hole 34	Post 34	900-925 = 130 cm 1st allusion
Hole 35	Post 35	925-950 = 130 cm 1st allusion
Hole 36	Post 36	950-975 = 130 cm 1st allusion
Hole 37	Post 37	975-1000 = 130 cm 1st allusion
Hole 38	Post 38	1000-1025 = 130 cm 1st allusion
Hole 39	Post 39	1025-1050 = 130 cm 1st allusion
Hole 40	Post 40	1050-1075 = 130 cm 1st allusion
Hole 41	Post 41	1075-1100 = 130 cm 1st allusion
Hole 42	Post 42	1100-1125 = 130 cm 1st allusion
Hole 43	Post 43	1125-1150 = 130 cm 1st allusion
Hole 44	Post 44	1150-1175 = 130 cm 1st allusion
Hole 45	Post 45	1175-1200 = 130 cm 1st allusion
Hole 46	Post 46	1200-1225 = 130 cm 1st allusion
Hole 47	Post 47	1225-1250 = 130 cm 1st allusion
Hole 48	Post 48	1250-1275 = 130 cm 1st allusion
Hole 49	Post 49	1275-1300 = 130 cm 1st allusion
Hole 50	Post 50	1300-1325 = 130 cm 1st allusion
Hole 51	Post 51	1325-1350 = 130 cm 1st allusion
Hole 52	Post 52	1350-1375 = 130 cm 1st allusion
Hole 53	Post 53	1375-1400 = 130 cm 1st allusion
Hole 54	Post 54	1400-1425 = 130 cm 1st allusion
Hole 55	Post 55	1425-1450 = 130 cm 1st allusion
Hole 56	Post 56	1450-1475 = 130 cm 1st allusion
Hole 57	Post 57	1475-1500 = 130 cm 1st allusion
Hole 58	Post 58	1500-1525 = 130 cm 1st allusion
Hole 59	Post 59	1525-1550 = 130 cm 1st allusion
Hole 60	Post 60	1550-1575 = 130 cm 1st allusion
Hole 61	Post 61	1575-1600 = 130 cm 1st allusion
Hole 62	Post 62	1600-1625 = 130 cm 1st allusion
Hole 63	Post 63	1625-1650 = 130 cm 1st allusion
Hole 64	Post 64	1650-1675 = 130 cm 1st allusion
Hole 65	Post 65	1675-1700 = 130 cm 1st allusion
Hole 66	Post 66	1700-1725 = 130 cm 1st allusion
Hole 67	Post 67	1725-1750 = 130 cm 1st allusion
Hole 68	Post 68	1750-1775 = 130 cm 1st allusion
Hole 69	Post 69	1775-1800 = 130 cm 1st allusion
Hole 70	Post 70	1800-1825 = 130 cm 1st allusion
Hole 71	Post 71	1825-1850 = 130 cm 1st allusion
Hole 72	Post 72	1850-1875 = 130 cm 1st allusion
Hole 73	Post 73	1875-1900 = 130 cm 1st allusion
Hole 74	Post 74	1900-1925 = 130 cm 1st allusion
Hole 75	Post 75	1925-1950 = 130 cm 1st allusion
Hole 76	Post 76	1950-1975 = 130 cm 1st allusion
Hole 77	Post 77	1975-2000 = 130 cm 1st allusion
Hole 78	Post 78	2000-2025 = 130 cm 1st allusion
Hole 79	Post 79	2025-2050 = 130 cm 1st allusion
Hole 80	Post 80	2050-2075 = 130 cm 1st allusion
Hole 81	Post 81	2075-2100 = 130 cm 1st allusion
Hole 82	Post 82	2100-2125 = 130 cm 1st allusion
Hole 83	Post 83	2125-2150 = 130 cm 1st allusion
Hole 84	Post 84	2150-2175 = 130 cm 1st allusion
Hole 85	Post 85	2175-2200 = 130 cm 1st allusion
Hole 86	Post 86	2200-2225 = 130 cm 1st allusion
Hole 87	Post 87	2225-2250 = 130 cm 1st allusion
Hole 88	Post 88	2250-2275 = 130 cm 1st allusion
Hole 89	Post 89	2275-2300 = 130 cm 1st allusion
Hole 90	Post 90	2300-2325 = 130 cm 1st allusion
Hole 91	Post 91	2325-2350 = 130 cm 1st allusion
Hole 92	Post 92	2350-2375 = 130 cm 1st allusion
Hole 93	Post 93	2375-2400 = 130 cm 1st allusion
Hole 94	Post 94	2400-2425 = 130 cm 1st allusion
Hole 95	Post 95	2425-2450 = 130 cm 1st allusion
Hole 96	Post 96	2450-2475 = 130 cm 1st allusion
Hole 97	Post 97	2475-2500 = 130 cm 1st allusion
Hole 98	Post 98	2500-2525 = 130 cm 1st allusion
Hole 99	Post 99	2525-2550 = 130 cm 1st allusion
Hole 100	Post 100	2550-2575 = 130 cm 1st allusion

APPENDIX D
SCOPE OF WORK

Lagoon N side of

Creek approaching

Husky P. 100

1 c. 3 - 100

Small P. 15

B. 15-20

0. 100

Husky P. 100

N side of creek

E. 100

SCOPE OF WORK
CULTURAL RESOURCES INVESTIGATION
OF SITE 47LC176 AND SURVEY OF PORTIONS OF THE
STATE ROAD AND EBNER COULEE PROJECT,
LA CROSSE, WISCONSIN

1.00 INTRODUCTION

1.01 The Contractor will undertake a cultural resources investigation of Site 47LC176 and survey of portions of the State Road and Ebner Coulee flood control project, La Crosse, Wisconsin.

1.02 This cultural resources inventory partially fulfills the obligations of the Corps of Engineers (Corps) regarding cultural resources, as set forth in the National Historic Preservation Act of 1966 (Public Law (P.L.) 89-665), as amended; the National Environmental Policy Act of 1969 (P.L. 91-190); Executive Order (E.O.) 11593 for the "Protection and Enhancement of the Cultural Environment" (Federal Register, 13 May 1971); the Archaeological and Historical Preservation Act of 1974 (P.L. 93-291); the Advisory Council on Historic Preservation "Regulations for the Protection of Historic and Cultural Properties (36 CFR Part 800); the Department of the Interior guidelines concerning cultural resources (36 CFR Part 60); and the applicable Corps regulations (ER 1105-2-50).

1.03 The laws listed above establish the importance of Federal leadership, through the various responsible agencies, in locating and preserving cultural resources within project areas. Specific steps to comply with these laws, particularly as directed in P.L. 93-291 and E.O. 11593, are being taken by the Corps " . . . to assure that Federal plans and programs contribute to the preservation and enhancement of non-federally owned sites, structures, and objects of historical, architectural, or archaeological significance." A part of that responsibility is to locate, inventory, and nominate to the Secretary of the Interior all such sites in the project area that appear to qualify for listing on the National Register of Historic Places.

1.04 Executive Order 11593 and the 1980 amendments to the National Historic Preservation Act further direct Federal agencies " . . . to assure that any federally owned property that might qualify for nomination is not inadvertently transferred, sold, demolished or substantially altered." In addition, the Corps is directed to administer its policies, plans, and programs so that federally and non-federally owned sites, structures, and objects of historical, architectural, or archaeological significance are preserved and maintained for the inspiration and benefit of the people.

1.05 This cultural resources investigation will serve several functions. The report will be a planning tool to aid the Corps in meeting its obligations to preserve and protect our cultural heritage. It will be a comprehensive, scholarly document that not only fulfills federally mandated legal requirements but also serves as a scientific reference for future professional

studies. It will identify sites that may require additional investigations and that may have potential for public-use development. Thus, the report must be analytical in nature, not just descriptive.

2.00 PROJECT DESCRIPTION

2.01 The State Road and Ebner Coulee flood control project is located in La Crosse County in west-central Wisconsin on the east side of the city of La Crosse. The plan of improvement for local protection consists of channel deepening and enlarging downstream from Hagen Bridge to the mouth and includes 12,300 feet of concrete-lined rectangular and trapezoidal channel, 700 feet of riprap channel, two overflow spillways, a drop structure, a stilling basin, three new street bridges, and a new railroad bridge. The upper 5,400 feet of rectangular channel is designed for standard project flood (SPF) protection and the remaining 7,600 feet of channel is designed for 100-year protection.

2.02 Site 47LC176 was discovered during field investigations conducted by the Mississippi Valley Archeology Center, Inc., La Crosse, Wisconsin, in the summer of 1983. The site is located immediately west of Drive-In Road between Pammel Creek and Pammel Creek Road. Cultural material consisted of lithic debitage, both grit and shell tempered ceramics, mussel shell fragments, burned and unburned bone, and the charred remains of corn and possibly beans and squash. The site appears to represent a sealed Oneota ridged agricultural field. The site, discovered in a cut bank along Pammel Creek, is buried by 1 to 2 meters of historic alluvium. Preliminary field work did not determine the physical extent of the site.

2.03 Although the areas to be impacted by this proposed project were previously surveyed for cultural resources, the location of a deeply buried site (47LC176) in the upstream portion of the project warrants additional work in this area. Project changes in the area of the outlet structure also warrant additional work in the downstream area.

3.00 DEFINITIONS

3.01 For the purpose of this study, the cultural resources investigation will involve Phase II testing of site 47LC176 and a Phase I survey in specified upstream and downstream project areas.

3.02 "Cultural resources" are defined to include any building, site, district, structure, object, data, or other material relating to the history, architecture, archaeology, or culture of an area.

3.03 "Phase I cultural resources survey" is defined as an intensive, on-the-ground survey and testing of an area sufficient to determine the number and extent of the resources present and their relationship to project features. A Phase I cultural resources survey will result in data adequate to assess the general nature of the sites present; a recommendation for additional testing of those resources which, in the professional opinion of the Contractor, may

provide important cultural and scientific information; and detailed time and cost estimates for Phase II testing.

3.04 "Phase II testing" is defined as the intensive testing of those sites that may provide important cultural and scientific information. Phase II testing will result in data adequate to determine the eligibility of the resources for inclusion on the National Register of Historic Places, a plan for the satisfactory mitigation of eligible sites that will be directly or indirectly impacted, and detailed time and cost estimates for mitigation.

4.00 SURVEY AND TESTING SPECIFICATIONS

4.01 Phase II testing will be conducted at site 47LC176 in accordance with Section 3.04 above.

4.02 A limited Phase I cultural resources survey will be conducted from site 47LC176 to the project's upstream terminus just northeast of Hagen Road, approximately 2,650 feet. This survey will focus on cut bank profiling of Pammel Creek and limited shovel testing as required. The purpose of this work is to ensure that sites similar to 47LC176 have not gone undetected.

4.03 A limited Phase I survey will also be accomplished at the downstream terminus of the project where excavation of 4.5 acres will be required to ensure that flows from the terminus structure are not impeded.

5.00 PERFORMANCE SPECIFICATIONS

5.01 The Contractor will use a systematic, interdisciplinary approach in conducting the study. The Contractor will provide specialized knowledge and skills during the course of the study to include expertise in archaeology and in other social and natural sciences as required. It is strongly recommended that a geomorphologist or soil scientist be present at times during the testing of site 47LC176 to interpret the depositional nature of the cultural deposits.

5.02 The extent and character of the work to be conducted by the Contractor will be subject to the general supervision, direction, control, review, and approval of the Contracting Officer.

5.03 Techniques and methodologies that the Contractor uses during the investigation shall be representative of the current state of knowledge for their respective disciplines.

5.04 The Contractor must keep standard records that shall include, but not be limited to, field notebooks, site survey forms, field maps, and photographs.

5.05 The recommended professional treatment of recovered materials is curation and storage of the artifacts at an institution that can properly insure their preservation and that will make them available for research and public view. If such materials are not in Federal ownership, the consent of

the owner must be obtained, in accordance with applicable law, concerning the disposition of the materials after completion of the report. The Contractor will be responsible for making curatorial arrangements for any collections that are obtained. Such arrangements must be coordinated with the appropriate officials of Wisconsin and approved by the Contracting Officer.

5.06 When sites are not wholly contained within the project limits, the Contractor shall survey an area outside the project limits large enough to include the entire site within the survey area. This procedure shall be done in an effort to delineate site boundaries and to determine the degree to which the site will be impacted.

5.07 The Contractor shall provide all materials and equipment as may be necessary to expeditiously perform those services required of the study.

5.08 Should it become necessary in the performance of the work and services, the Contractor shall, at no cost to the Government, secure the rights of ingress and egress on properties not owned or controlled by the Government. The Contractor shall secure the consent of the owner, his representative, or agent, in writing prior to effecting entry on such property. If requested, a letter of introduction, signed by the District Engineer, can be provided to explain the project purposes and request the cooperation of landowners. When a landowner denies permission for survey, the Contractor shall immediately notify the Contracting Officer and shall describe the extent of the property to be excluded from the survey.

5.09 The Contractor will test the site areas sufficiently to determine the existence of cultural materials and/or features, their condition (in situ or disturbed), the horizontal and vertical distribution of the remains, and, if possible, the cultural affiliation of the site(s).

5.10 Recommendations on the significance of the site(s) according to the National Register of Historic Places criteria will be included in the Contractor's report. These recommendations will include a detailed justification for the significance or non-significance of the site(s), including what research questions the site(s) can answer.

5.11 The on-the-ground examination will involve an intensive survey and shovel testing of the area to determine the number and extent of cultural resources present. This includes standing structures as well as historical and prehistorical archaeological sites.

5.12 The Contractor's survey will include surface inspection in areas where surface visibility permits adequate recovery of cultural materials and subsurface testing in all areas where surface visibility is limited or obscured. Subsurface investigation will include shovel testing, coring, soil borings, cut bank profiling or some other appropriate testing method. If field methods vary from those required, they must be described and justified in the report.

5.13 The required survey grid or transect interval is 15 meters (50 feet) and testing interval is 15 meters (50 feet). However, this interval may vary depending upon field or site density/size conditions. If the recommended interval is not used, written justification should be presented in the technical report for selection of an alternate interval. All subsurface tests will be screened through 1/4-inch mesh hardware cloth and will be recorded on appropriate testing forms. All subsurface testing forms will be included in the appendix to the Contractor's report. The Contractor will also indicate the locations of all subsurface tests on USGS and/or project maps and key these with the testing forms in the appendix.

5.14 The Contractor will recommend appropriate mitigative measures, including time and cost estimates, where warranted.

5.15 All testing will employ standard archaeological techniques, including formal test pits. All material will be screened through 1/4-inch mesh screen.

5.16 The tested areas will be returned as closely as practical to pre-survey conditions by the Contractor.

6.00 GENERAL REPORT REQUIREMENTS

6.01 The Contractor will submit the following types of reports, which are described in this section and in section 9.00: field report, field notes, draft contract report, final contract report, and a completed National Register form(s), if appropriate.

6.02 The Contractor's technical report will include, but will not be limited to, the following sections, as appropriate to the study.

a. Title Page: The title page will provide the following information: the type of investigation undertaken; the cultural resources that were assessed (archaeological, historical, and architectural); the project name and location (county and State); the date of the report; the Contractor's name; the contract number; the name of the author(s) and/or Principal Investigator; the signature of the Principal Investigator; and the agency for which the report is being prepared.

b. Management Summary: This section will include a concise summary of the study, which will contain all essential data for using the document in the Corps of Engineers management of the project. This information will minimally include: why the work and budget, summary of the study (field work; lab analysis), study limitations, study results, significance, recommendations, and the repository of all pertinent records and artifacts.

c. Table of Contents

d. List of Figures

e. List of Plates

f. Introduction: This section will identify the sponsor (Corps of Engineers) and the sponsor's reason for the study; an overview of the testing and survey project, with the site(s) located on USGS quad maps. This section will also provide an overview of the cultural resource study to be undertaken; define the location and boundaries of the study areas (with regional and area-specific maps); define the study area within its cultural, regional, and environmental context; reference the scope of work; identify the institute that did the work, the number of people involved in the study, and the number of person-days/hours spent on the study; identify the dates when the various types of work were completed; identify the repository of records and artifacts; and provide a brief overview or outline of how the study report will proceed and an overview of the major goals that the study/study report will accomplish.

g. Previous Archaeological and Historical Studies: This section will provide a brief summary and evaluation of previous archaeological and historical studies of the study area including the researchers, date, extent, adequacy of the past work, study results, and cultural/behavioral inferences derived from the research.

h. Environmental Background: This section will include a brief description of the study area environment, including the following categories: geology, vegetation, fauna, climate, topography, physiography, and soils, with reference to prehistoric, historic, ethnographic, and contemporary periods. Any information available on the relationship of the environmental setting to the area's prehistory and history will also be included. This section will be of a length commensurate with other report sections.

i. Theoretical and Methodological Overview: This section will include a description or statement of the goals of the Corps of Engineers and the study researcher, the theoretical and methodological orientation of the study, and the research strategies that were applied in achieving the stated goals.

j. Field Methods: This section will describe the specific archaeological activities undertaken to achieve the stated theoretical and methodological goals. The section will include all field methods, techniques, strategies, and rationale or justification for specific methods or decisions. The description of the field methods will minimally include: a description of field conditions, topographic/physiographic features, vegetation conditions, soil types, stratigraphy, testing results with all appropriate testing forms to be included as an appendix, and the rationale for eliminating uninvestigated areas. Testing methods will include descriptions of test units (size, intervals, stratigraphy, depth) and the rationale behind their placement.

k. Laboratory Methods: This section should explain in detail the laboratory methods employed and the rationale behind the method selected. This section should also contain references to accession numbers used for all collections, photographs and field notes obtained during the study, and the location where they are permanently housed.

l. Analysis: This section will describe and provide the rationale for the specific analytic methods and techniques used, and describe and discuss the qualitative and quantitative manipulation of the data. Limitations or problems with the analysis based on the data collection results will also be discussed. This section will also contain references to accession numbers used for all collections, photographs, and field notes obtained during the study, and the location where they are permanently housed.

m. Investigation Results: This section will describe all the archaeological resources encountered during the study, and other data pertinent to a complete understanding of the resources within the study area. This section will include enough empirical data that the study results can be independently assessed. The description of the data will minimally include: a description of the site; amounts and type of material remains recovered; relation of the site or sites to physiographic features, vegetation and soil types; direct and indirect impacts to the site(s); analysis of the site and data (e.g., site type, cultural historical components and information, cultural/behavioral inferences or patterns); site condition; and location and size information (elevation, complete quad map source, legal description, address if appropriate, and site size, density, depth, and extent).

n. Evaluation and Conclusions: This section will evaluate and formulate conclusions concerning location of the site(s); size, condition, distribution, and density in relation to other sites in the area; and significance in relation to the local and regional prehistory, protohistory, and history. This section will also discuss the potential and goals for future research; the reliability of the analysis; relate results of the study and analysis to the stated study goals; identify changes, if any, in the research goals; synthesize and compare the results of the analysis and study; integrate ancillary data; and identify and discuss cultural/behavioral patterns and processes that are inferred from the study and analysis results.

o. Recommendations: This section will discuss the significance of the site(s) in relation to the research goals of the study and the National Register of Historic Places criteria; make recommendations as to the eligibility or potential eligibility of the site(s) to the National Register; recommend future mitigative or Phase II testing priorities and needs, as appropriate; and make suggestions with regard to the Corps of Engineers planning goals. These recommendations will include a time and cost estimate for mitigation or Phase II testing, if necessary. If it is the Contractor's assessment that the site(s) is (are) or is not significant, the methods of investigation and reasoning which support that conclusion will be presented. Any evidence of cultural resources or materials which have been previously disturbed or destroyed will be presented and explained. If certain areas are not accessible, recommendations will be made for future consideration.

p. References: This section will provide standard bibliographic references (American Antiquity format) for every publication cited in the report. References not cited in the report will be listed in a separate "Additional References" section.

q. Appendix: This section will include the Scope of Work, resumes of all personnel involved, all correspondence derived from the study, all State site forms, and all testing and any other pertinent report information referenced in the text as being included in the appendix.

6.03 The location of all sites and other features discussed in the text will be shown on a legibly photocopied USGS map and will be bound into the report. All maps will be labeled with a caption/description, a north arrow, a scale bar, township, range, map size, and dates, and the map source (e.g., the USGS quad name or published source) and will have proper margins.

6.04 All sites identified in the course of the study, including find spots and known sites, will be presented on State site forms as an appendix to the report. Data should also be provided about the present condition of the sites (disturbance by natural or manmade processes) and content of any collections from the sites. Known sites all have their State site forms updated as necessary. All State site forms will be submitted to the State Archaeologist.

6.05 Failure to fulfill these report requirements will result in the rejection of the Contractor's report by the Contracting Officer.

7.00 FORMAT SPECIFICATIONS

7.01 The Contractor shall submit to the Contracting Officer the photographic negatives for all black and white photographs that appear in the final report.

7.02 All text materials will be typed, single-spaced (the draft reports should be space-and-one-half or double-spaced), on good quality bond paper, 8.5 inches by 11.0 inches with 1.5-inch binding and bottom margins and 1-inch margins on the top and other margin, and will be printed on both sides of the paper.

7.03 Information will be presented in textual, tabular, and graphic forms, whichever are most appropriate, effective, or advantageous to communicate the necessary information.

7.04 All figures and maps must be clear, legible, self-explanatory, and of sufficiently high quality to be readily reproducible by standard xerographic equipment, and will have margins as defined above.

7.05 The final report cover letter shall include a budget of the project.

7.06 The draft and final reports will be divided into easily discernible chapters, with appropriate page separation and heading.

8.00 MATERIALS PROVIDED

8.01 The Contracting Officer will furnish the Contractor with the following materials: access to any publications, records, maps, or photographs that are on file at the district headquarters.

9.00 SUBMITTALS

9.01 The Contractor will submit reports according to the following schedules:

a. Field Report: The original and one copy of a field report will be submitted after completion of the field work. The field report will summarize the work, project/field limitations, methodology used, time used, and survey results.

b. Project Field Notes: One legible copy of all the project field notes will be submitted with the draft contract report.

c. Draft Contract Report: Seven (7) copies of the draft contract report will be submitted on or before 1 October 1984. The draft contract report will be reviewed by the Corps of Engineers, the State Historic Preservation Officer, the State Archaeologist, and the National Park Service. The draft contract report will be submitted according to the report and contract specifications outlined in this Scope of Work.

d. Final Contract Report: The original and 15 copies of the final contract report will be submitted 60 days after the Corps of Engineers comments on the draft contract report are received by the Contractor. The final contract report will incorporate all the comments made on the draft contract report.

e. National Register Forms: An original and one copy of a completed National Register Nomination Form(s) will be submitted with the final contract report.

9.02 Neither the Contractor nor his representative shall release any sketch, photograph, report, or other material of any nature obtained or prepared under the contract without specific written approval of the Contracting Officer prior to the acceptance of the final report by the Government. After the Contracting Officer has accepted the final report, distribution will not be restricted by either party except that data relating to the specific location of extant sites will be deleted in distribution to the public.

9.03 All materials, documents, collections, notes, forms, maps, etc., which have been produced, gathered, or acquired in any manner for use in the completion of this contract shall be made available to the Contracting Officer upon request.

10.00 METHOD OF PAYMENT

10.01 Requests for partial payment under this fixed price contract shall be made monthly on ENG Form 93. A 10-percent retained percentage will be withheld from each partial payment. Upon approval of the final reports by the Contracting Officer, final payment, including previously retained percentage, shall be made.

APPENDIX E
PERSONAL RESUMES

CURRICULUM VITAE

GENERAL INFORMATION

Name: James Patrick Gallagher

PII Redacted

Present Position and Academic Rank: Professor, University of Wisconsin-La Crosse; Executive Director, Mississippi Valley Archaeology Center at the University of Wisconsin-La Crosse.

EDUCATION

B.S. Anthropology, Saint Louis University, 1964

M.A. Anthropology, Southern Methodist University, 1969

Ph.D. Southern Methodist University, 1977

Dissertation Title: Ethnoarchaeological and Prehistoric Investigations in the Ethiopian Central Rift Valley.

PROFESSIONAL EXPERIENCE: TEACHING

University of Oklahoma, teaching assistant, 1966-1967

Trinidad Jr. College, Trinidad, Colorado, director of archaeology field school, 1968

Southern Methodist University, teaching assistant, 1969

Southern Methodist University, Instructor, University College, 1970, 1972

El Centro College, Dallas, Texas, Instructor, 1972-1977

University of Wisconsin-La Crosse, 1977 - Present

RESEARCH

Archaeologist, Illinois State Museum (J. Caldwell), summer 1963

Archaeologist, Wisconsin State Museum excavations at Aztalan (J. Freeman), summer 1964

Research Assistant, University of Oklahoma Spiro Mound Project (J. Brown), 1964-1966

Archaeologist, University of Oklahoma, (R. Bell), summer 1965

Ethnographer, one semester ethnographic project in Kiowa Apache material culture (A. Ricciardelli) 1964, University of Oklahoma

Archaeologist, excavations at Roc de Combe, France (F. Bordes) 1966

Research Assistant, Southern Methodist University Nubian Prehistoric Project (J. Shiner), 1967-1968

Field Director, archaeology field school, Trinidad Jr. College, Trinidad, Colorado, 1968

Archaeologist, excavations at Pech de l'Aze, France (F. Bordes), 1969

Archaeologist, excavations at Ksar A'Quil, Lebanon (J. Tixier), 1969

Field Director, Southern Methodist University Ethiopian Prehistoric Expedition (F. Wendorf), 1971-1972

Principal Investigator, Ethiopian Ethnoarchaeology Project, 1971-1972

Field Director, Egyptian Predynastic Project (F. Hassan), 1978

Principal Investigator, archaeological investigations at the Valley View Site, 1978, 1979

Principal Investigator, La Crosse Area Archaeological Survey I, 1979

Principal Investigator, Overhead Site excavation, 1980

Principal Investigator, La Crosse Area Archaeological Survey II, 1980 & 1981

Principal Investigator, Quail Cave excavation, 1981

Principal Investigator, Sand Lake Coulee Project, 1982

Principal Investigator, La Crosse Area Archaeological Survey III, 1982

Principal Investigator, excavations at the Dahl Site, 1982-1983

Principal Investigator, Pammel Creek Archeological Project, 1983

Principal Investigator, The Sand Lake Ridged Field, Project, 1984

Principal Investigator, Root River Archaeological Survey, 1984

Principal Investigator, Salvage Excavation at the Midway Village Site, 1984

CULTURAL RESOURCE MANAGEMENT PROJECT REPORTS

1977

Archaeological Survey of the Proposed Chippewa River Crossing, Buffalo Co., Wis., Dairyland Power Cooperative, La Crosse.

Archaeological Survey of the Holmen Industrial Park.
Village of Holmen, Wis.

1978

Archaeological Survey of the Alma-Tremval and Alma-Crystal Powerline Transmission Route (81 miles). Dairyland Power.

Archaeological Survey of Sewer and Water Pipe Line Routes in Medary Township. City of La Crosse.

Archaeological Survey of By-Pass Route in the City of La Crosse.
City of La Crosse.

Timber Coulee Creek Survey, Vernon County. Wisconsin Department of Natural Resources.

Archaeological Survey of Lake Marinuka, Galesville, Wi. Lake Marinuka Protection and Rehabilitation District.

An Archaeological Inspection of the Pigeon Creek Bridge Area, Trempealeau Co. Westbrook Associates.

1979

Archaeological Survey of Transmission Line Routes and Substation Location in Vernon County. Dairyland Power.

An Archaeological Inspection of a Proposed Waste Water Treatment Facility near Dorchester, Clark County, Wis. ETC Engineering Inc.

An Archaeological Survey of Copeland Park. City of La Crosse.

An Archaeological Inspection of the Gillett St. Viaduct and Approaches.
City of La Crosse.

An Archaeological Inspection of a Proposed Powerline Route near Mauston, Juneau Co. Dairyland Power.

An Archaeological Inspection of a Waste Water Treatment Site at Alma, Buffalo Co. ETC Engineering.

An Archaeological Survey at Brice Prairie, La Crosse Co. Dairyland Power.

An Archaeological Inspection at Coon Valley, Vernon County. ETC Engineering.

An Archaeological Survey of Pine Creek, Trempealeau Co. Westbrook Associates.

An Archaeological Inspection of a Bridge Crossing Site on the Little Baraboo River, Sauk Co. Westbrook Associates.

An Archaeological Survey of a Portion of the Little Grant River, Grant Co. Wisconsin Department of Natural Resources.

An Archaeological Survey in St. Croix County. Dairyland Power.

An Archaeological Survey of the Proposed Right-of-Way for County Highway A in Monroe Co. Donahue and Associates.

An Archaeological Survey of a Sewage Disposal Site at Stoddard, Vernon Co. ETC Engineering.

1980

Thunderbird Hills Archaeological Survey, La Crosse, WI. Neitzel Engineering Co.

An Archaeological Survey of the Washco Substation, Washington County, WI. Dairyland Power Cooperative.

An Archaeological Survey of the Comfort Substation in Northern Wisconsin. Dairyland Power Cooperative.

An Archaeological Survey of the Proposed Genoa, Wisconsin-Lansing, Iowa Transmission Route. Dairyland Power Cooperative.

An Archaeological Inspection of the Fairchild Site. Dairyland Power Cooperative.

The Potosi Substation and Transmission Route. Dairyland Power.

An Archaeological Survey of the Pammel Creek Area. La Crosse, WI. U.S. Corps of Engineers.

Phase II Excavations at Pammel Creek. U.S. Corps of Engineers.

Phase II Testing at Sites Along the Proposed Transmission Line at Elk River, Minnesota.

An Archaeological Survey of the Hannibal Power Line Route. Dairyland Power.

1981

An Archaeological Survey at Viola, WI. ETC Engineering.

Cultural Resources Investigation at Steuben, WI. Substation Site. Dairyland Power.

A Cultural Resources Investigation at Wittenburg Park, City of La Crosse.

CTH 'OS' Archaeological Survey, La Crosse County.

An Archaeological Survey of the Sherco Benton Power Line, St. Cloud, Minnesota. Northern States Power Co.

A Phase I and Phase II Study of the Proposed Holmen Sewer Line and Treatment Site. Village of Holmen, WI.

Riceford Transmission Line and Substation, Riceford, Minnesota. Dairyland Power.

Root River Channelization Project, Houston Co., Minnesota. U.S. Corps of Engineers.

Archaeological Testing of the Southern End of Goose Island, Vernon Co., WI. U.S. Corps of Engineers.

An Archaeological Inspection of a Dredge Spoil Site in Trempealeau, WI. U.S. Corps of Engineers.

Archaeological Excavations (Phase I & II) of the Proposed Wastewater Treatment Site at Coon Valley, WI. Village of Coon Valley.

1982

An Archaeological Survey of the Proposed Coon Valley Wastewater Treatment Site, Vernon County, Wisconsin.

Cultural Resources Investigations at Goose Island, Vernon County, Wisconsin, (with T. R. Hayes, Olin F. McCormick, Al Samet, and K. Stevenson).

1983

A Cultural Resources Survey of Homestead Park and Prairie Heights Park at Onalaska, in La Crosse County, Wisconsin (with T. Silha), Mississippi Valley Archaeology Center at the University of Wisconsin-La Crosse, Reports of Investigation #17.

An Archaeological Inspection of the Proposed Lancaster-Mount Zion Transmission Line in Crawford Co., Wisconsin. Mississippi Valley Archaeology Center at the University of Wisconsin-La Crosse. Reports of Investigation #9.

Cultural Resources Investigations of Portions of the State Coulee Project, La Crosse, Wisconsin (with R. Boszhardt). Mississippi Valley Archaeology Center at the University of Wisconsin-La Crosse, Reports of Investigation #11.

An Archaeological Reconnaissance of the Buckhard Substation. Mississippi Valley Archaeology Center at the University of Wisconsin-La Crosse, Reports of Investigation #6.

1984

An Archaeological Inspection of the Harpers Ferry Substation. Mississippi Valley Archaeology Center at the University of Wisconsin-La Crosse, Reports of Investigation #21.

An Archaeological Reconnaissance of the Oakdale Switching Station, Monroe County, Wisconsin. Mississippi Valley Archaeology Center at the University of Wisconsin-La Crosse, Reports of Investigation #23.

An Archaeological Reconnaissance of the Krause Substation Site and Transmission Route, La Crosse County, Wisconsin (with R. Boszhardt). Mississippi Valley Archaeology Center at the University of Wisconsin-La Crosse, Reports of Investigation #24.

Phase II Cultural Investigations along C.T.H "Z" on Brice Prairie, La Crosse County, Wisconsin (with R. Boszhardt and R. Sasso). Mississippi Valley Archaeology Center at the University of Wisconsin-La Crosse, Reports of Investigation #22.

OTHER

Participant, summer seminar and field study in Egyptian civilization and culture, Ain Shams University, Cairo, 1975.

Director, Center for Research Archaeology, La Crosse, Wisconsin, 1977-1981.

Board of Advisors, Institute for Minnesota Archaeology, 1983-1984.

Board of Governors, Wisconsin Archaeological Survey, 1984.

HONORS AND AWARDS

Fellow, Institute for the Study of Earth and Man, Southern Methodist University, Dallas, Texas.

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

Wisconsin Archaeological Survey
Wisconsin Archaeological Society
Society for American Archaeology
Association of Iowa Archaeologists
Minnesota Archaeological Society
Iowa Archaeological Society

PUBLICATIONS AND PAPERS PRESENTED

1965 Gallagher, J. P., Michael Davis, and Fred Schneider, "Plains Indian German Silverwork in the Anadarko, Oklahoma Area". Papers in Anthropology, 6:22-40, University of Oklahoma, Norman.

1972 Gallagher, J. P., "Ethnoarchaeology in south Central Ethiopia", Paper presented at the VIIth Pan African Congress of Prehistory and Quaternary Studies, Addis Ababa.

- 1973 Gallagher, J. P., "Preliminary report on archeological research near Lake Zuai, Ethiopia" Annales d'Ethiopie, 9:64-80, Ethiopian Archeological Institute, Addis Ababa.
- 1973 Gallagher, J. P., "Ethiopian Ethnoarcheology" paper presented at the Conference of Africanist Archaeologists, April 16, 1973, Southern Methodist University, Dallas, Texas.
- 1974 Gallagher, J. P., "Preparation of hides with stone tools in south central Ethiopia", Journal of Ethiopian Studies, 13 (1):177-182, Institute of Ethiopian Studies, Addis Ababa.
- 1977 Gallagher, J. P., "Ethiopian Research", Nyame Akuma, 11:11-14.
- 1977 Gallagher, J. P., "Contemporary Stone Tools in Ethiopia: Implications for Archaeology", Journal of Field Archeology, 4:407-414.
- n.d. Hassan, Fekri A., T. R. Hays, and J. P. Gallagher, "Recent Excavations of Predynastic Sites in the Nagada-Khattara Aea, Upper Egypt", in press, Nyame Akuma.
- 1979 Gallagher, J. P., "Excavations at the Valley View Site, a fortified Oneota village near La Crosse, Wis.", paper presented at the 1979 meeting of the Society for American Archaeology, Vancouver, B.C.
- 1979 Gallagher, J. P., "The Valley View Site, An Orr Focus Village near La Crosse", paper presented at the Midwest Archaeological Conference, October 13, 1979, Milwaukee, WI.
- 1979 Gallagher, J. P., Katherine Stevenson, and James Theler, "The Valley View Site (47Lc34), an Orr Phase Oneota Site at La Crosse, 1979 Excavations and Analysis." Technical report on file, State Historical Society of Madison.
- 1980 Gallagher, J. P., "La Crosse Area Archaeological Survey, 1979 Season". Technical Report on file, State Historical Society of Wisconsin, Madison.
- 1980 Gallagher, J. P. and Katherine Stevenson, "Oneota Subsistence and Settlement in Southwestern Wisconsin". Paper presented at the Midwest Archaeological Conference, Oct. 5, Chicago.
- 1980 Fekri Hassan, T. R. Hays, J. P. Gallagher, et al, "Towards a Model of Agricultural Developments in Predynastic Egypt". Paper presented at the International Symposium on the Origin and Early Development of Food Producing Cultures in North-Eastern Africa, Poznan Poland, Nov.15.

- 1980 Gallagher, J. P. and Katherine Stevenson, Preliminary Report on Excavations at the Valley View Site (47Lc34), an Oneota Village near La Crosse, Wisconsin Archaeologist, vol. 61 #4.
- 1980 Fekri Hassan, T. R. Hays, J. P. Gallagher, et al, "Agricultural Developments in the Nagaa, Egypt region during the Predynastic Period". Paper presented at the annual meeting of the American Research Center in Egypt, 13-15 April, San Fransisco. Published in Nyame Akuma, vol. 17, 1980.
- 1980 Gallagher, J. P. and Katherine Stevenson, "The Overhead Site - a Multicomponent Site on the Mississippi River at La Crosse." Paper presented at the Midwest Archaeological Conference, Oct. 4, Chicago.
- 1980 Gallagher, J. P. The Valley Site. Paper presented at the symposium on Oneota Archaeology. University of Wisconsin, La Crosse, March 15.
- 1981 Gallagher, J. P., Katherine Stevenson, et al, "The Overhead Site." Technical Report at the State Historical Society of Wisconsin.
- 1982 Gallagher, J. P., Roland Rodell, and Katherine Stevenson, "The 1980-1982 La Crosse Area Archaeological Survey". Reports of Investigations Number 2, Mississippi Valley Archaeology Center, La Crosse, Wisconsin.
- 1982 Gallagher, J. P. and Robert Boszhardt, "The Dahl Site". Reports of Investigations Number 1, Mississippi Valley Archaeology Center, La Crosse, Wisconsin.
- 1982 Gallagher, J. P. The Mississippi Valley Archaeology Center. The Wisconsin Archaeologist 63 (3):237-239.
- 1982 Gallagher, J. P., and Katherine Stevenson, Oneota Subsistence and Settlement in Southwestern Wisconsin. Oneota Studies, ed. by G. Gibbon, Publications in Anthropology No. 1, pp. 15-27, University of Minnesota, Minneapolis.
- 1982 Gallagher, J. P., R. Boszhardt, and R. Sasso, Recent Excavations of Oneota Ridged Fields in Western Wisconsin: The Sand Lake Site (47Lc44). Paper presented at the meeting of the Wisconsin Archaeological Survey, Oct. 30, Stevens Point, Wisconsin.
- 1983 Test Excavations at the Leon Site (47Lc49). Reports of Investigations No. 5, Mississippi Valley Archaeology Center at the University of Wisconsin-La Crosse.
- 1983 Gallagher, J. P. A Tribute to William Willis, Pioneer Black Anthropologist, Paper presented at the annual meeting of the American Anthropological Association, November 16-20, Chicago.

VITAE

ROBERT F. BOSZHARDT

PII Redacted

AREA OF INTEREST: Prehistoric Adaptations and Cultural Change in the Upper Mississippi River Valley and Western Upper Great Lakes.

ACADEMIC HISTORY: University of Wisconsin-Waukesha Center, 1972-1974.
University of Wisconsin-Milwaukee, Bachelor of Arts,
Anthropology, 1977
University of Wisconsin-Madison, Master of Arts,
Anthropology, 1982

MEMBERSHIP IN PROFESSIONAL SOCIETIES AND ORGANIZATIONS

The Iowa Archaeological Society
The Galena Historical Society
Wisconsin Archaeological Society (Advisory Council)
Iowa Historical Society
La Crosse Area Archaeological Society
Wisconsin Archaeological Survey
Minnesota Archaeological Society

PAPERS PRESENTED

- 1981 The Prairie Phase, an "Early Woodland" Manifestation in the Upper Mississippi River Valley. Midwest Archaeological Conference, Madison, Wisconsin. Junior participant with Dr. James Stoltman and James L. Theler. Paper delivered by Dr. James Stoltman.
- 1981 Preliminary Report on an Archaeological Survey of Pool 12, Upper Mississippi River. Midwest Archaeological Conference, Madison, Wisconsin.
- 1981 Report and Discussion of Archaeological/Geomorphological Interpretations of Pool 12 in the Upper Mississippi River Valley. Wisconsin Archaeological Society, November meeting, Waukesha, Wisconsin.
- 1982 The La Crosse Area Archaeological Society's Excavations at the Dahl Site. La Crosse Area Archaeological Society, September meeting, La Crosse, Wisconsin.
- 1983 Archaeology and Benthology: Do These Fields Share Common Interests? 31st Annual Meeting of the North American Benthological Society, April 27, La Crosse, Wisconsin.

- 1983 A Comparison of the Floodplain Archaeology of Navigation Pools 7 and 8 at La Crosse with pools 10, 12, and 16 of the Upper Mississippi River. Midwest Archaeological Conference, Iowa City, Iowa.

PUBLICATIONS

- 1977 Radiocarbon Dates for Wisconsin, 1976, A Second Compilation. The Wisconsin Archeologist, 58(2):84-150.
- 1982 Wisconsin Radiocarbon Update: 1981, The Wisconsin Archeologist, Vol. 63 (2).
- 1983 Ridged Fields at the Sand Lake Site Near La Crosse, Wisconsin. Minnesota Archaeological Newsletter, No. 30.
- 1983 Prehistory of the Upper Mississippi. In The River Revival. Mississippi River Revival, Inc., Minneapolis, Minnesota.
- 1983 Preliminary Investigations: Archaeology and Sediment Geomorphology, Navigation Pool 12, Upper Mississippi River. The Wisconsin Archeologist, 64 (2). Senior author with David F. Overstreet.

TECHNICAL REPORTS

- 1981 Archaeological Investigations on Private Lands in the Lowland Floodplain near Prairie du Chien, Wisconsin. State Historical Society of Wisconsin. Section of Comprehensive Report on Archaeological Investigations of the Prairie du Chien locality, Crawford County, Wisconsin, prepared by Dr. James B. Stoltman, James L. Theler, Constance Arzigian and Jeff Behm.
- 1981 Preliminary Investigations: Archaeological and Sediment Geomorphology, Navigation Pool 12, Upper Mississippi River. Great Lakes Archaeological Research Center, Reports of Investigations No. 115 (3 volumes). Senior author with Dr. David Overstreet.
- 1982 Archaeological Investigations in the Lowland Floodplain of Navigation Pool 10 near Prairie du Chien, Crawford County, Wisconsin. Master's Thesis, University of Wisconsin-Madison, Department of Anthropology.
- 1982 Archaeological Investigations at The Dahl Site (47Lc148), Mississippi Valley Archaeology Center, Inc. Reports of Investigations No. 1. Senior author with Dr. James P. Gallagher.
- 1982 Archaeological Testing and Evaluation of 11Jd126. Addendum to Preliminary Investigations: Archaeology and Sediment Geomorphology, Navigation Pool 12, Upper Mississippi River. Great Lakes Archaeological Research Center Reports of Investigations Number 115. Senior author with David F. Overstreet.
- 1983 Cultural Resources Reconnaissance Inventory of Portions of the Eau Claire Recreation Area, St. Croix County, Wisconsin. Mississippi Valley Archaeology Center, Reports of Investigations Number 3.

- 1983 Report on Preliminary Cultural Resources Investigations At Thief Island In Navigation Pool 9 Of the Upper Mississippi River. Mississippi Valley Archaeology Center, Report of Investigations Number 4.
- 1983 Test Excavations at the Leon Site (47Lc49). Mississippi Valley Archaeology Center, Reports of Investigations Number 5.
- 1983 Phase II Cultural Resources Inventory and Evaluation at 47Bf131 in Bluff Siding, Buffalo County, Wisconsin. Mississippi Valley Archaeology Center, Reports of Investigations Number 16.
- 1983 Cultural Resources Inventory of Planned Site of Cochrane State Branch Bank at Bluff Siding, Buffalo County, Wisconsin. Mississippi Valley Archaeology Center Reports of Investigations Number 13.
- 1983 Cultural Resources Investigations: Survey of Portions of the State Road and Ebner Coulee Project, La Crosse County, Wisconsin. Mississippi Valley Archaeology Center Reports of Investigations Number 11.
- 1983 Cultural Resources Investigations of Two Sections of a Proposed Gas Main in La Crosse County, Wisconsin. Mississippi Valley Archaeology Center Report of Investigations Number 14.
- 1983 Phase II Cultural Resources Inventory and Evaluation of a Proposed Realignment of a Segment of CTH "SN" in La Crosse County, Wisconsin. Mississippi Valley Archaeology Center Reports of Investigations Number 15.

ARCHAEOLOGICAL FIELD/LABORATORY EXPERIENCE

- 1973 Crew member, Archaeological Field School, Hixton Quarry Site, University of Wisconsin-Waukesha. Dr. David F. Overstreet, Director.
- 1974 Crew member, Byron Power Plant Project, First and Second Phase Testing, University of Wisconsin-Milwaukee. Robert Birmingham, Director.
- 1975 Crew member, Apostle Island Survey, Beloit College. Dr. David F. Overstreet, Director.
- 1975 Crew member, Marina Site Excavation, Madeline Island, Wisconsin, Beloit College. Robert Birmingham, Director.
- 1975-1976
Lithic Analysis, Apostle Island Survey, Beloit College. Dr. David F. Overstreet, Director.
- 1976 Crew member, Jones Bluff Survey (Alabama River), Office of Archaeological Research, University of Alabama. C. Oakly and M. Watson, Directors.

- 1976 Crew member, Subassistant, Phipps Bend Excavations (Tennessee), Office of Archaeological Research, University of Alabama. Robert Lafferty, Director.
- 1976 Crew member, Rock River Survey (Rock Island County, Illinois), University of Wisconsin-Milwaukee. Robert Birmingham, Director.
- 1977 Crew member, Historic Site Survey, Fox River Watershed, Waukesha County, Wisconsin. Dr. David F. Overstreet, Director.

1977-1979

Research Assistant, the Great Lakes Archaeological Research Center, Waukesha, Wisconsin. Project participation included:

- Archaeological Inventory and Evaluation of Weston, Unit 3 Power Plant, Marathon County, Wisconsin.
- Archaeological Inventory of the Sanitary Sewer Collection System and Waste Disposal Treatment Facility: Town of Norway Sanitary District No. 1, Racine County, Wisconsin.
- Archaeological Inventory and Evaluation of the Proposed Sewage Treatment Facilities at Mukwanago, Waukesha County, Wisconsin.
- An Archaeological Inventory and Evaluation: The Proposed Waukesha County Technical Institute Expansion Project.
- An Intensive Archaeological Survey, Milan-Big Island Phase II Study, Rock River, Illinois.
- Archaeological Inventory and Evaluation: Brillion, Wisconsin Wastewater Treatment Facilities.
- Archaeological Inventory and Evaluation of Butte des Morts Utility District, Menasha (West).
- Cultural Resource Inventory of the Chippewa River in Sawyer County, Wisconsin.
- Cultural Resources Reconnaissances, Loves Park, Illinois, Interim 2, Flood Feasibility Study.
- Archaeological Inventory of the Sand Hill Estates and Hillside Homes Community, Oneida, Outagamie County, Wisconsin.
- Archaeological Inventory of the Proposed Stabilization Ponds, Lift Station and Interceptor Route, Mellen, Wisconsin.
- Archaeological Inventory of the Cherryland Airport Extension, Door County, Wisconsin.
- Archaeological Inventory of the Proposed Realignment of County D, Florence County, Wisconsin.

-Cultural Resource Evaluation of the Sturgeon River Wilderness Study Area, Ottawa National Forest.

-Archaeological Inventory of the Proposed Outagamie Airport Industrial Park Site.

-Cultural Resource Evaluation of Two Chequamegon National Forest Wilderness Study Areas: Flynn and Round Lakes.

-Archaeological Inventory and Evaluation of the Proposed Wastewater Treatment Facilities at Cambellsport, Fond du Lac County, Wisconsin.

-Archaeological Inventory and Evaluation of the Proposed Dredging Deposition Areas at Muskego, Wisconsin.

-Initial Archaeological Inventory of Chequamegon National Forest in Northwestern Wisconsin.

-Archaeological Inventory and Evaluation of the Proposed Wastewater Treatment Facilities at Columbus, Wisconsin.

-Archaeological Inventory of the Proposed Wisconsin Public Service Corporation Ash Disposal Site, Brokaw, Marathon County, Wisconsin.

-Cultural Resource Inventory and Evaluation of the Proposed Expansion of the Wastewater Treatment Facilities at Monroe, Green County, Wisconsin (Field Supervisor).

-Archaeological Inventory of the Proposed Electrical Power Service Line from Prairie du Chien to Indian Isle, Crawford County, Wisconsin (Field Supervisor).

-Archaeological Inventory and Evaluation of the Proposed Wastewater Treatment Facilities at Friesland, Columbia County, Wisconsin.

-Archaeological Inventory of the Proposed Hidden Harbor Development at Fish Creek, Door County, Wisconsin.

-Salvage Excavations at the Convent Knoll Site (47Wk327), a Red Ochre Cemetery at Elm Grove, Waukesha County, Wisconsin.

-Archaeological Excavation at the Mile Long Site (47W1110), Lake Delevan, Walworth County, Wisconsin.

-Archaeological Inventory and Evaluation of the Proposed Wastewater Treatment Facilities at Boscobel, Grant County, Wisconsin.

-Archaeological Inventory of the Proposed Wastewater Treatment Facilities at Palmyra, Jefferson County, Wisconsin.

-Archaeological Recovery at 11R1337, an Early Middle Woodland Shell Midden in East Moline, Illinois.

-Cultural Resources and Assessment: Butternut and Franklin Lakes, Nicolet National Forest.

-Archaeological Survey of the East Shore of Lake Winnebago: 1979.

-Archaeological Survey of the Green Bay Coastal Corridor (Field Supervisor).

-A Cultural Resource Survey of Proposed Undertakings Nicolet National Forest, Wisconsin.

1980 Research Assistant, University of Wisconsin-Madison, Laboratory of Archaeology. Project participation included:

-Archaeological Investigations in the Prairie du Chien Locality, Crawford County, Wisconsin.

-Supervisor, University of Wisconsin-Madison, Field School in Archaeology.

-Archaeological Investigations on Private Lands in the Lowland Floodplain of the Upper Mississippi River near Prairie du Chien, Wisconsin.

1981 Research Assistant, the Great Lakes Archaeological Research Center, Waukesha, Wisconsin. Project participation included:

-Archaeological Testing of an Early Logging Camp (47Fr142) Forest County, Wisconsin.

-A Cultural Resource Survey at Kinickinic State Park, Pierce County, Wisconsin.

-Archaeological Survey of Pool 12, Upper Mississippi River Valley (Field Supervisor).

-Archaeological Testing of Two Prehistoric Sites (47Fr141, 47Fr143), at Oak Lake in Northcentral Wisconsin.

1982 Field Director. Archaeological Investigations at The Dahl Site (47Lc148), La Crosse County, Wisconsin.

1982 Co-Field Director. Archaeological Survey and Excavations at the Sand Lake Site (47Lc44), La Crosse County, Wisconsin.

1982 Field Director. La Crosse County Archaeological Survey, 1982.

1982 Field Director. Archaeological Survey at the Eau Galle Reservoir, St. Croix County, Wisconsin.

1983 Co-Field Director. La Crosse Area Archaeological Survey.

Field Director. Archaeological Excavations at the Pammel Creek Site (47Lc61), La Crosse County, Wisconsin. This project involved three phases: contract mitigation, a high school field school, and an adult public field school.

Field Director. Phase I survey at the mouth of State Road Coulee for the State Road and Ebner Coulee flood control project, La Crosse County, Wisconsin.

Field Director. Phase I survey for the Cochrane State Branch Bank at Bluff Siding, Buffalo County, Wisconsin.

Field Director. Phase II testing for Cochrane State Branch Bank at Bluff Siding II Site (47Bf131), Buffalo County, Wisconsin.

Field Director. Phase I survey for Northern State Power of two sections of a proposed gas main in La Crosse County, Wisconsin.

Field Director. Phase II testing at four prehistoric sites along CTH "SN" in La Crosse County, Wisconsin.