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A Statistical Analysis of the Ceramics from the Dieffenderfer Site (20SJ179), St. Joseph County, Michigan

Mark A. Steeby

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A STATISTICAL ANALYSIS OF THE CERAMICS
FROM THE DIEFFENDERFER SITE (20SJ179),
ST. JOSEPH COUNTY, MICHIGAN

by

Mark A. Steeby

A Thesis
Submitted to the
Faculty of The Graduate College
in partial fulfillment of the
requirements for the
Degree of Master of Arts
Department of Anthropology

Western Michigan University
Kalamazoo, Michigan
June 1997

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Mark A. Steeby

A STATISTICAL ANALYSIS OF THE CERAMICS
FROM THE DIEFFENDERFER SITE (20SJ179),
ST. JOSEPH COUNTY, MICHIGAN

Mark A. Steeby, M.A.

Western Michigan University, 1997

The Dieffenderfer site, located in Constantine Township, St. Joseph County, Michigan, is a multi-component site situated in the middle St. Joseph River valley. Calibrated radiocarbon dates from several features at the site suggest multiple re-use during the Late Woodland period from A.D. 1000 to A.D. 1400, with the most intensive occupations occurring during the 12th through 14th centuries. These dates are supported by a large Late Woodland ceramic assemblage in association with three spatially discrete activity areas; two of these activity loci are represented by housefloors, suggesting a degree of permanence by the residents.

A cluster analysis performed on the Late Woodland ceramic material from the site suggests that the Dieffenderfer occupants were participating in a cultural tradition which was separate and distinct from the better known Allegan tradition of southwestern Michigan. The significance of the site appears to be its intermediate position between those sites in the lower St. Joseph, such as Moccasin Bluff and Wymer, which demonstrate strong cultural ties to Mississippian peoples to the southwest in northwestern Indiana and northeastern Illinois, and those sites located upstream in the middle St. Joseph valley, such as Kline 1 and Whorley Earthwork, that evidence a stronger relationship to Iroquoian groups in northern Michigan, southeastern Michigan, and southern Ontario. The Late Woodland ceramics from the site are described and analyzed in light of these possible cultural relationships.

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CHAPTER I

INTRODUCTION

Statement of Problem

The primary focus of this thesis is the Late Woodland ceramics from the Dieffenderfer site. The purpose of the analysis is to develop a ceramic typology for this material with the objective of delineating the different cultural occupations represented at the site and determining their relative temporal placement. The main goal is to interpret the cultural history of the site and attempt to assess its significance in relationship to other Late Woodland sites in the St. Joseph valley. Before such an analysis can proceed it is first necessary to understand the problem which currently exists with the archaeological record in this region.

The Late Woodland period in southern Michigan has been interpreted as a period marked by cultural stability, cooperation and interaction characterized by the movement of people, ideas, resources, and finished goods across environmental and social boundaries (Brashler 1981; Holman and Kingsley 1996; Kingsley 1977, 1989; Kingsley and Garland 1980; Luedtke 1976). This dynamic process has been evidenced archaeologically at sites in the form of lithic raw materials, ceramics and/or foreign components outside their normal geographical ranges (Holman and Kingsley 1996:10). Further, it has been observed in the sharing of specific ceramic attributes and attribute configurations amongst the various cultural traditions believed to have occupied the region during this period (Brashler 1981:329).

In southwest Michigan, much of what is known of the Late Woodland period is derived almost exclusively from archaeological sites in the lower Kalamazoo and the

Grand and Muskegon river drainages. In these drainages, sites are generally plentiful and suggest occupation by groups participating in similar, albeit different, cultural traditions (Brashler 1981). This interpretation is suggested by cultural material, namely ceramics, recovered from sites in these drainages. While the archaeological record of these respective drainages is not complete, our understanding of cultural history and dynamics is generally quite good. This situation differs from our understanding of cultural change and development in the St. Joseph valley, which remains poorly understood (Figure 1). The archaeological record of this region is dominated almost exclusively by a single site, Moccasin Bluff, located in the lower river valley. The material remains from this site suggest strong ties with Mississippian Oneota-related Fisher-Huber groups occupying sites in the Kankakee Valley of northwestern Indiana and northeastern Illinois. This relationship is evidenced by a high frequency of shell tempered ceramic material during the Late Woodland Moccasin Bluff (ca. A.D. 1050-1300/1400) and Huber phases (ca. A.D. 1400-1600) at the site (Bettarel and Smith 1973:153).

In contrast to the lower valley of the St. Joseph, archaeological evidence from sites in the middle drainage suggests a different cultural pattern. One difference is the low frequency of shell tempered ceramics at sites in the middle St. Joseph. Ceramic material from the less well-known Whorley Earthwork site (Speth 1966) and the Kline 1 site (Quattrin 1988), both located on tributaries of the main river, hint at relationships with Iroquoian groups to the north in the Straits of Mackinac area and/or in southeastern Michigan and southwestern Ontario. Recent archaeological research at the Dieffenderfer site (20SJ179), a small hamlet located on the banks of the St. Joseph river in the middle valley, with radiocarbon dates from approximately A.D. 1150-1400, suggests this relationship was stronger than previously believed. Examination of the ceramic assemblage from Dieffenderfer suggests that cultural developments and interaction patterns were altogether different, that its Late Woodland occupants may have been participants

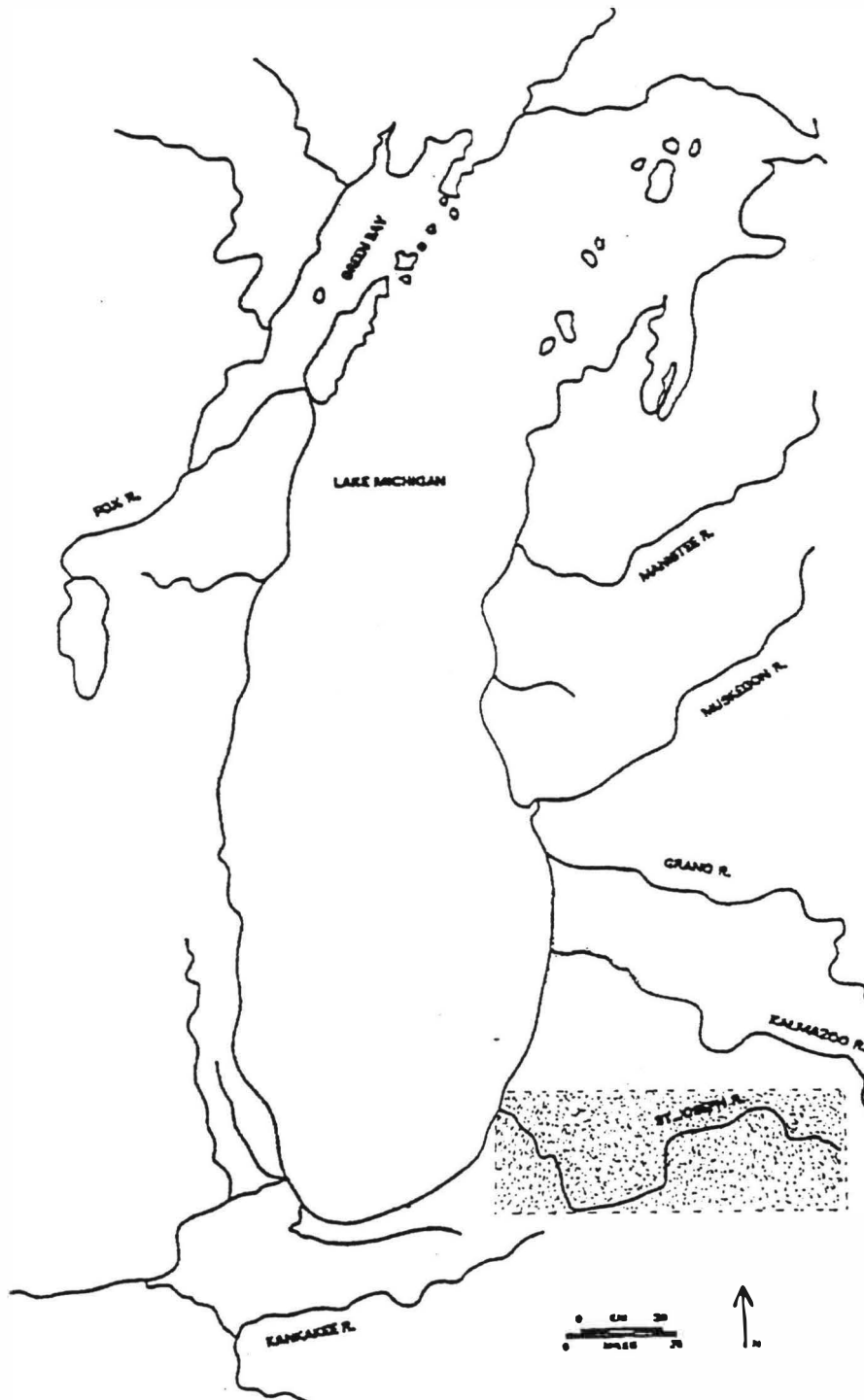


Figure 1. The St. Joseph Valley in the Lake Michigan Basin.

in (or familiar with) a cultural tradition which was largely separate and distinct from the one which occupied the lower valley. Testing the hypothesis that groups in the middle valley were culturally different from those in the lower valley is problematic at present. The culture history of this area has not been worked out because we lack sizable ceramic data sets from sites in the lower and middle valley with which to make comparisons and offer meaningful interpretations. As a result, the main goal of this analysis is to provide a description and classification of the Late Woodland ceramic assemblage recovered from Dieffenderfer and to establish a foundation upon which this hypothesis can be tested.

Goals and Objectives

The approach to this analysis is both intra-site and inter-site. Utilizing an intra-site perspective, I will attempt to determine the spatial and temporal distribution of specific ceramic wares (and types) at the site, to interpret the cultural history of the main occupations represented at Dieffenderfer, and to delineate patterns of social interaction in space and over time. On a broader (i.e., inter-site) level, I will use this information to delineate possible change and development in hopes of contributing to a better understanding of Late Woodland cultural dynamics in the St. Joseph valley. To accomplish these goals this thesis is comprised of several sections. The first section (Chapter II) places the Dieffenderfer site in a regional context, including both a brief history of St. Joseph valley archaeological research, a description of the location of the site and its environment, and a discussion of the history of excavations at the site. In Chapter III, I will discuss the theoretical approach utilized in this analysis including a discussion of the methodology and technique used to produce the typology. The method of classification used in this thesis is cluster analysis. In Chapter IV, I will present the results of the cluster

analysis and present a typological framework for the Dieffenderfer ceramics. In the fifth chapter, I will delineate the different cultural occupations at the site and attempt to determine their relative temporal placement. In doing so I will discuss the significance of the site in relationship to other Late Woodland sites in the St. Joseph valley. In the final section (Chapter VI) I will present a general discussion of Late Woodland cultural dynamics in the middle St. Joseph valley based on my research at Dieffenderfer and offer some recommendations for future research.

CHAPTER II

THE DIEFFENDERFER SITE

The Site in Context of St. Joseph Valley Archaeology

This section provides a brief history of St. Joseph valley archaeology. A review of previous archaeological research in the region provides context for understanding the significance of the Dieffenderfer site as it relates to the problem addressed in this analysis.

The first archaeological investigations in the St. Joseph valley were conducted by collectors and amateur archaeologists in the late 19th and early 20th centuries. These investigations focused primarily on the excavation of burial mound sites bordering the St. Joseph and its tributary streams and lakes (Mangold 1981; Quimby 1941). While these excavations provided evidence of a Middle Woodland presence in the area and suggested some relationship with Havana Hopewellian groups in the Illinois Valley, they did little to further our understanding of cultural dynamics in the region. The cultural material from these Hopewellian mounds was recovered without regard for provenience and context. As a result, much of this material cannot be identified with any one particular mound or mound group and a reconstruction of the cultural sequence of the mounds is unlikely. Further, any knowledge or information we now have of Middle Woodland life in the region must be regarded as somewhat biased due to the investigators having focused their efforts exclusively on the excavation of mound sites. Further complicating matters is that many of these mounds and their contents have since been destroyed due to intensive farming and urban expansion at the onset of Euro-American settlement in the region. What little information has been gathered to date remains poorly understood in light of the fact that no Middle Woodland habitation (i.e., village) sites attributable to these

mounds have been identified or recorded in the St. Joseph River valley (Garland and DesJardins 1995:11).

The first investigations to be documented in the St. Joseph valley using controlled means of excavation and artifact recovery were conducted by researchers from the University of Michigan at the Moccasin Bluff site (20BE6), located just downstream from Buchanan in the lower valley of Berrien County, Michigan (Bettarel and Smith 1973). This series of investigations, beginning in 1948, was significant because the ceramic material from Moccasin Bluff was used to construct a Late Woodland cultural chronology for both the site and the St. Joseph valley. The most important outcome of work at this site was the creation of two new ceramic wares, Moccasin Bluff ware and Berrien ware.

Moccasin Bluff Ware consisted of two ceramic subgroups. The first comprised a series of grit tempered vessels produced before A.D. 1000 that were likened to Wayne Ware from southeastern Michigan (Bettarel and Smith 1973:112). The second subgroup of grit tempered pots were manufactured after A.D. 1000 and displayed more affinity with Upper Mississippian ceramic manifestations in northern Indiana and Illinois. Berrien Ware was shell tempered and also appears after A.D. 1000. Berrien Ware, like the later Moccasin Bluff Ware subgroup, also shared affinity with Upper Mississippian ceramics to the south and west (Bettarel and Smith 1973:114-115). Bettarel and Smith suggested these ceramic developments represented a shift in adaptive strategies by the site's inhabitants, reflecting a move towards intensive maize agriculture in a floodplain environment sometime around A.D. 1100. This adaptive shift was attributed to several factors including increased interaction and/or contact with agriculturally oriented Mississippian groups, the availability of prime alluvial floodplain soils in the immediate vicinity of the site, and increasingly warmer temperatures in the western Great Lakes region.

Since publication of the Moccasin Bluff site report in 1973, archaeological research in the valley has expanded to include the middle as well as the lower valley. These investigations have taken the form of large archaeological survey projects using surface reconnaissance methods and, in a minority of cases, limited subsurface testing. These surveys have been productive, resulting in the identification and recording of 244 new archaeological sites in the valley. Unfortunately, of these sites in the middle valley, only 19 (or roughly 8%) warranted additional testing and of these 19, only three sites (Walters I, Cupp 5 and Kline 1) have been excavated. As a result, the archaeological record of the St. Joseph valley remains poorly known and understood in relationship to adjacent river systems, most notably the Kalamazoo to the north. A brief description of these survey projects, including a description of the area(s) surveyed and their research objectives, is warranted given the current gap in the archaeological record and the status of archaeological research in the St. Joseph valley.

Beginning in 1979, archaeological research commenced with the U.S. 31 freeway expansion project in the lower St. Joseph River valley in Berrien County, Michigan (Garland and Mangold 1980). This cultural resource management project, funded by the Michigan Department of Transportation, was conducted by Western Michigan University under the direction of Dr. Elizabeth Garland. The project goal was to survey a twenty mile long right-of-way proposed for extension of U.S. 31, identify and record any sites which would be impacted by construction of the freeway extension, and attempt an ecological reconstruction of the area. This project identified and recorded 23 new archaeological sites within the survey area. Of these, seven were subjected to Phase II testing in 1980 (Garland and Clark 1981); the most productive were the Stover, Eidson, Wymer, King and Rock Hearth sites (Garland 1984). Although this project was limited by the objectives of the freeway extension corridor, it was significant because it greatly enhanced our knowledge and understanding of the Archaic and Early Woodland cultures

which once resided in the area and also provided additional evidence of Mississippian influence in the lower St. Joseph valley (Garland 1990b, 1991).

At about the same time, archaeological research in the Portage River drainage, a tributary of the St. Joseph, was being initiated by staff at the Department of Anthropology at Western Michigan University (Cremin, Stout, and Murphy 1982; Cremin, DeFant, Adams 1984; Cremin and DeFant 1986; Dorothy and Garland 1981). These investigations were important because they marked the first documented, large-scale archaeological surveys in the middle valley. The research strategy employed was geared toward surveying extensive tracts of land (referred to as transects) along both the river's main course and its associated tributaries and lakes. The goal was to identify sites within these transects for purposes of future research, to determine the ecological variables most favorable for site location and to define patterns of land use by the prehistoric native inhabitants. It was believed that the information gained could be used to make comparisons between those sites located within the St. Joseph valley and sites located in adjacent river drainages. The results of the survey projects have proven useful in identifying differences in site size, site density, and occupational intensity between the Portage and Kalamazoo study areas. A brief description of each of these projects and their results is provided below.

The first of these survey projects, referred to as the Portage River Archaeological Survey, was initiated between 1979-1980 under the direction of Lawrence Dorothy and Dr. Elizabeth Garland of Western Michigan University through a grant from the Michigan History Division, Department of State (Dorothy and Garland 1981). This survey project included areas of Mendon, Park, Flowerfield and Florence Townships in St. Joseph County and Brady Township in Kalamazoo County. Survey of the project area was limited to surface reconnaissance and resulted in 29 new sites being identified and recorded. Prehistoric components were identified as Paleo-Indian, Archaic, and Wood-

land components and four of these sites have received additional attention. The most productive of these sites was Kline 1 (20SJ29), a predominantly Late Woodland site located on the west bank of Portage Lake in Mendon Township (Quattrin 1988). Kline 1 is particularly relevant to the present analysis and it will be addressed more fully below.

In 1982, a survey was completed of the Indian Lake area in Pavilion Township, Kalamazoo County. This survey project was conducted by archaeologists from Western Michigan University under the direction of Dr. William Cremin (Cremin, Stout and Murphy 1982). The total area included in the Indian Lake survey project was estimated at 3.9 km² of land and, again, surface reconnaissance was emphasized. This project resulted in 53 new sites being identified and recorded, of which three were later tested. In 1984, archaeologists from Western Michigan University returned to the Indian Lake area to further evaluate its potential (Cremin, DeFant, and Adams 1984). In addition, survey work was extended along Portage River to the vicinity of Barton Lake in Schoolcraft Township, Kalamazoo County. The 1984 survey covered an estimated area of 3.6 km², resulting in the identification and recording of 28 additional sites. Only one site discovered in 1984 has warranted further examination. Finally, examination of field margins along the shore of Barton Lake area, consisting of 33.1 ha of land, resulted in the identification and recording of seven new sites; again, only one of these sites has been test excavated. The prehistoric components identified during survey of the Indian Lake and Barton Lake areas included Paleo-Indian, Archaic, Woodland, and Upper Mississippian.

In 1985, research efforts shifted slightly in an effort to investigate prehistoric utilization of the prairie environments associated in the Portage River drainage (Cremin and DeFant 1986). The Gourdneck Prairie Archaeological Survey (GNPAS) was initiated to test the proposition that dry prairie environments and their associated bur oak openings were favorable locations for sites in prehistory as well as at the time of Euro-American settlement in the 19th century. The survey covered much of Gourd-Neck

Prairie in Schoolcraft Township, Kalamazoo County. This project, conducted by archaeologists from Western Michigan University under the supervision of Dr. William Cremin, included an area of approximately 11.4 km². Once again, the survey strategy employed was surface reconnaissance. This project resulted in the identification and recording of only 14 new archaeological sites, one of which has since been tested (Cremin and DeFant 1986).

In 1986, following several years of survey research along the Portage River, drainage area, including an associated prairie environment, the research emphasis shifted to investigate the archaeological potential of areas in closer proximity to the main channel of the Middle St. Joseph (Cremin and Quattrin 1987). The purpose was to extend the research goals used in the Portage River survey into the main river trench with hopes of identifying new sites, determining factors in prehistoric site location, understanding land use patterns, and making meaningful comparisons both within this segment of the St. Joseph valley and between the main river trench of the valley of a major tributary stream (Portage River). The survey targeted land in Leonidas and Colon Townships in St. Joseph County, comprising approximately 63.5 km² of land. The survey strategy once again relied on surface reconnaissance. During fieldwork, a total of 90 new sites were identified and recorded, of which three (Walters, Cupp and Campbell) have been excavated. The survey project resulted in the identification of many prehistoric components, including Paleo-Indian, Archaic and Woodland occupations.

Significantly, the 1986 survey was instrumental in delineating distinct differences between prehistoric land use along the Middle St. Joseph and the Portage and Kalamazoo Rivers. Notable differences included more and larger sites, greater site density, and a higher level of occupational intensity activity along the Middle St. Joseph than in the other two drainages. These differences were explained in terms of the attractiveness of the St. Joseph River to the native inhabitants, including a greater

abundance of highly desirable aquatic and riparian resources in the floodplain, a greater opportunity for hoe/digging stick cultivation due to the rich, easily tilled alluvial soils, and access to major inter-regional exchange between groups in southeastern Michigan and beyond and those areas to the south and west in northern Indiana and Illinois (Cremin and Quattrin 1987:84).

While surveys of the Portage River and Middle St. Joseph River were instrumental in identifying many new sites and defining land use patterns, the archaeological record of the Middle St. Joseph valley (and the St. Joseph drainage in general) remains incomplete and poorly understood. This is primarily an artifact of too little work throughout the drainage. Most sites that were identified and recorded were classified as single findspots or scatters of cultural material, consisting of both lithic debris and, in a minority of instances, light ceramic debris. Little subsurface testing has been completed in the Middle St. Joseph and of those sites that were subjected to additional testing only a few have been archaeologically productive. This is compounded by the fact that the effects of agriculture and the growth of areas along key areas of the Middle St. Joseph have forever destroyed the archaeological record of much of this region.

One of the most significant sites to date in the Middle St. Joseph drainage has been the Kline 1 site (Quattrin 1988). Calibrated dates from two features at the site (A.D. 1215, A.D. 1223) clearly suggest the main Kline 1 occupation was coeval with the later sub-phase of the Moccasin Bluff Phase (ca. A.D. 1200-1300) as defined by Bettarel and Smith (1973:153). Ceramic evidence from the site also supports this temporal placement. A preliminary analysis of the ceramic material recovered from Kline 1 suggests a substantial Late Woodland occupation and hints at relationships to Younger Tradition and/or Iroquoian-related groups to the east and lesser ties to Mississippian-related groups to the west (Quattrin 1988:74). Unfortunately, the Kline 1 ceramic assemblage is extremely small and fragmentary, making meaningful comparisons and interpretations problem-

atic. As Quattrin concludes in his analysis of the lithic and ceramic data from Kline 1, it is “only after several sites within the Middle St. Joseph drainage are excavated and reported will meaningful statements about local cultural relationships be possible” (Quattrin 1988:74). Further, he adds, “research in the Middle St. Joseph River drainage, in particular, and southcentral Michigan, in general, might clarify the cultural and subsistence influences of the strongly agricultural-based Mississippian and Iroquoian societies on southern Michigan inhabitants” (Quattrin 1988:74). Thus, Quattrin suggested that the Late Woodland period in the Middle St. Joseph drainage remained somewhat of an enigma.

The situation occurring in the Middle St. Joseph valley parallels that occurring in the lower valley. While the lower valley has produced more archaeologically productive sites (Wymer and Moccasin Bluff) and the archaeological record is relatively more complete than in the middle valley, the Late Woodland period also is poorly understood. This is because of the nature of the sites which have been excavated. Wymer is a predominantly early Mississippian period (ca. A.D. 1000-1100) site (Garland 1991:7). Very little information concerning the Late Woodland is expected given the fact that a high frequency of cordmarked, shell tempered ceramics attributable to Mississippian influence from the southwest predominate the site’s assemblage. Moccasin Bluff, on the other hand, evidences a small cordmarked, grit tempered ceramic assemblage attributable to the Late Woodland but, like Wymer, suggests strong ties to Mississippian groups located to the southwest. What little knowledge we have of the Late Woodland related groups in the lower valley is problematic given that the archaeological record is too dependent on the cultural material from Moccasin Bluff.

It is with these problems in mind that the importance of locating new sites in the lower and middle valley that provide good context, datable features and comparative artifact assemblages takes on increasing relevance. The Dieffenderfer site, located on the

Middle St. Joseph approximately 20-25 miles downstream from Kline 1 and an equal distance upstream from Wymer and the better known Moccasin Bluff, is such a site. A radiocarbon sample from Dieffenderfer, taken from a feature associated with a fairly intact housefloor, rendered a date of 840 ± 60 BP: A.D. 1110 (Beta-76073). This date, when calibrated, becomes A.D. 1222 with a one sigma range of A.D. 1165-1276 (Stuiver and Reimer 1993). This age is very comparable with two dated features at Kline 1 and clearly argues for a similar temporal placement in the later sub-phase of the Moccasin Bluff Phase in the St. Joseph valley (Quattrin 1988:63-63).

The significance of the Dieffenderfer site may be its intermediate position, conceived perhaps as some form of boundary, between a site in the Middle St. Joseph valley that suggests more easterly influences, such as Kline 1, and those sites located further downstream on the Lower St. Joseph, such as Wymer and Moccasin Bluff, that demonstrate stronger relationships with Mississippian groups to the southwest in northern Indiana and Illinois (Figure 2). Thus, the Dieffenderfer site affords an excellent opportunity to begin to understand the cultural complexity of the Middle St. Joseph valley as a conduit for interaction between east and west.

Site Location and Environment

The Dieffenderfer site is located in the NW 1/4, SW 1/4, SE 1/4, SW 1/4 of Section 32 of Constantine Township (T7S, R12W) in St. Joseph County, Michigan, on land owned by Mr. George Dieffenderfer of Constantine, Michigan. The site is situated approximately 1.5 miles upstream from the village of Mottville on the north bank of the St. Joseph River, immediately east of the river's confluence with Mill Creek, a small tributary stream which enters Section 32 from the north (Figure 3-4). The elevation of the riverbank which the site occupies is 237.2 meters above sea level. The site is bordered

- 1- Dieffenderfer
- 2- Wymer-West Knoll
- 3- Moccasin Bluff
- 4- Sumnerville Mounds
- 5- Whorley Earthwork
- 6- Kline 1
- 7- Schwerdt
- 8- Hacklander
- 9- Allegan Dam
- 10- Fennville
- 11- 46th St.
- 12- DeBoer
- 13- Armintrout-Blackman
- 14- Spoonville
- 15- Zemaitis
- 16- Spring Creek
- 17- Juntunen
- 18- Beyer
- 19- Griesmer
- 20- Hoxie Farm
- 21- Anker
- 22- Fisher
- 23- Plum Island

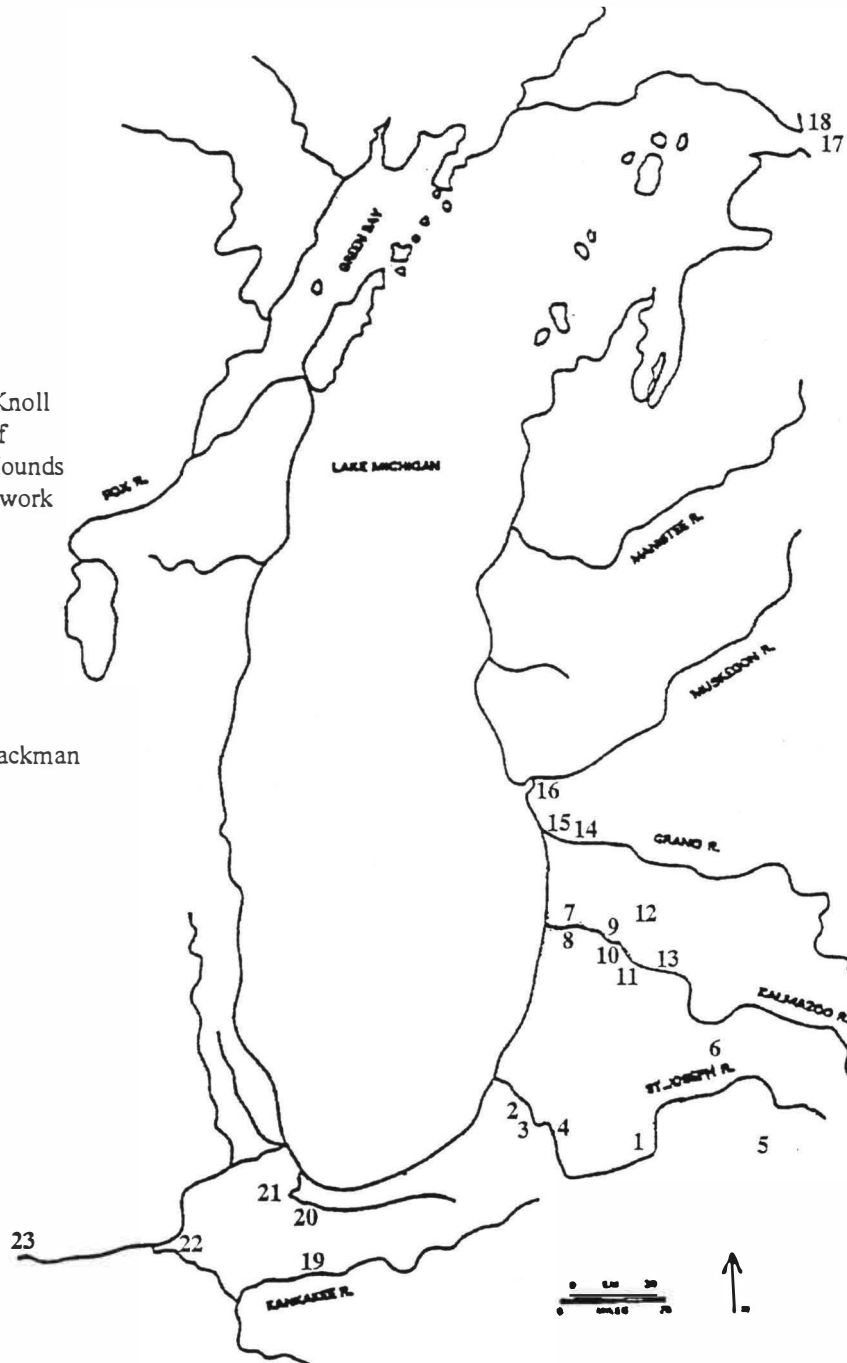


Figure 2. The Location of Sites Mentioned in the Text.

by the St. Joseph River on one side and is flanked by low-lying wetlands on its remaining three sides. The wetlands appear to occupy a former river channel or chute that has subsequently filled with sediment over time. During periods of high water flooding in the past it is likely that the landform on which the site is located was surrounded by flowing water. The site is presently accessed by a gravel road that traverses a large culvert used to drain discharge from the wetlands to the river (Cremin and DesJardins 1994:6).

The soil in the immediate vicinity of the Dieffenderfer site is characterized by the Oshtemo-Spinks Association (USDA 1983). This soil association is composed of 45% Oshtemo soils, 20% Spinks soils and 35% soils of minor extent. Soils of this association tend to be loamy and sandy in composition, nearly level to gently rolling, and well drained with slopes ranging from 0-18%. Oshtemo and Spinks soils are found frequently on outwash plains and moraines and are sometimes situated on knolls and ridges along drainage ways. This soil association occurs quite frequently in St. Joseph County, comprising 65% of those identified in the region (USDA 1983:5-6).

Cleland (1966:6) and others place southern lower Michigan, including the St. Joseph River valley, within the Carolinian biotic province. The dominant presettlement forest type of this province is described as oak-hickory. When located on well drained soils, this association is dominated by black, red and white oak, hickory, sugar maple, beech, walnut, butternut, elm and tulip. Sites located on less well drained soils typically are dominated by elm, silver maple, ash, swamp white oak, basswood, shagbark hickory, sycamore, cottonwood, red oak and bur oak (Cleland 1966:8).

While the biotic province designation reveals a general sense of the environment there is a great degree of ecological variation in southern lower Michigan, and the St. Joseph valley in particular. In order to gain a better understanding of the environment in the immediate area of the Dieffenderfer site it is necessary to look at previous attempts at environmental reconstruction in the region.

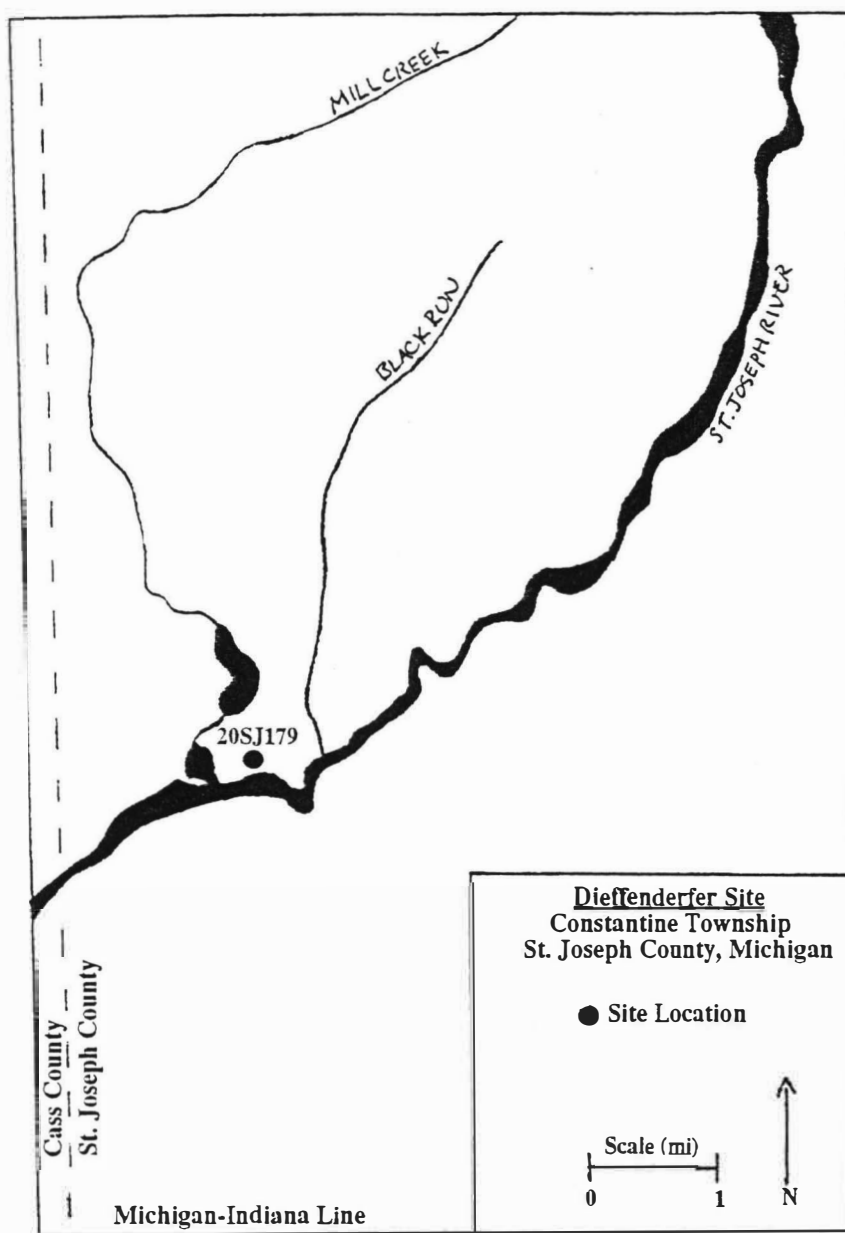


Figure 3. The Dieffenderfer Site on the St. Joseph River.

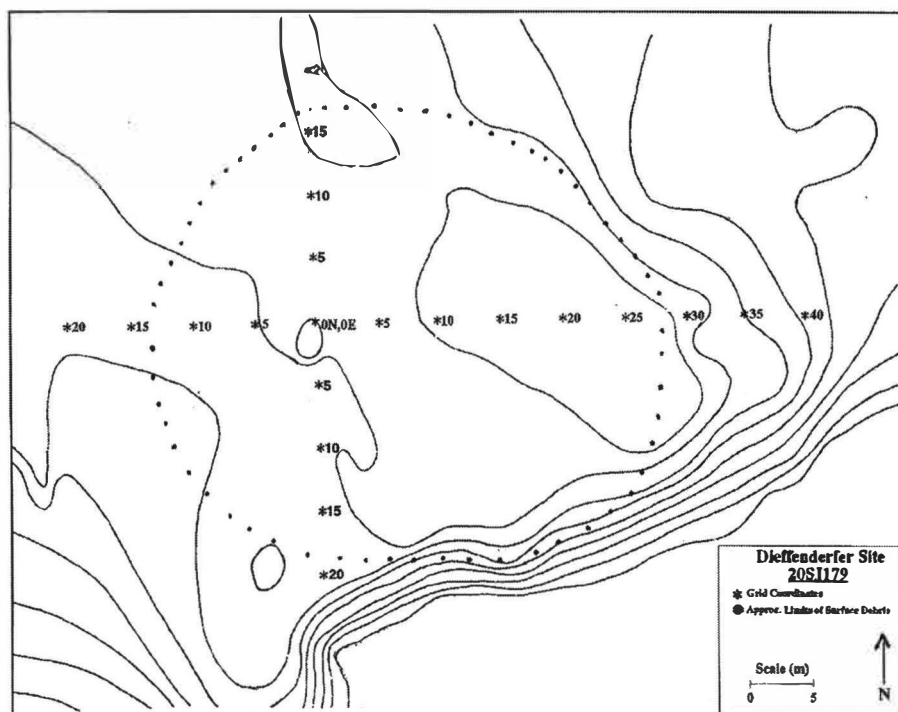


Figure 4. The Dieffenderfer Site (20SJ179).

Reconstruction of the prehistoric environment surrounding the Dieffenderfer site is based primarily on recent attempts to document the vegetation of southwestern Michigan (Brewer et al. 1984). Other recent sources addressing environmental reconstructions of the Portage River and the Lower St. Joseph River areas were also consulted (Ebberts 1990; Higgins 1990; Knapp 1992). This information provides insight into the nature of the environment in southwestern Michigan prior to the dramatic effects of Euro-American settlement and permanent modification of the landscape.

The main source of information for the presettlement vegetation map created by Brewer et al. (1984) were survey records compiled by the United States Government Land Office (GLO), representing individual county surveys of southwestern Michigan completed between the years 1825-1832, and earlier attempts at documenting presettlement vegetation in the area by Kenoyer (1930, 1934, 1940 and 1943). The classification system

used in the creation of the map follows the system used by Curtis (1959) in describing presettlement vegetation types in Wisconsin.

A review of the map compiled by Brewer et al. (1984) suggests the site was located in an area providing access to a large and diverse resource base. In addition to the main river channel adjacent to the site, comprising a separate zone in and of itself, four different vegetation zones or types within a 1-5 mile radius of the site have been identified. The proximity of these different zones may have been a significant factor in site location decision making by the prehistoric inhabitants at Dieffenderfer.

At the time of historic settlement in the region, the Dieffenderfer site was situated in an area of transition, bordered by oak savanna to the north and oak forest to the south (Brewer et al. 1984). Oak savanna is characterized by a tree density between 1 and 15 stems per acre and is dominated by white oak and smaller numbers of yellow oak, black oak, bur oak, pignut hickory and shagbark hickory. Research in the Lower St. Joseph valley suggests that, in addition to the major dominant species, oak savanna environments may have included smaller amounts of red oak, dogwood, blue ash and black cherry (Ebberts 1990:95). Interspersed with oak savanna are areas identified by Brewer et al. (1984) as pockets of wet prairie vegetation, dry marsh, sedge meadow and/or grass dominated fens. In the Lower St. Joseph, the dominant species of oak savanna tend to be grasses rather than trees, resulting in a mixture of both prairie and forest species (Ebberts 1990:95). Oak savannas, much like their prairie counterparts, lack a variety of edible plant resources. Acorns and hickory nuts are the predominate edible tree crops. Exploitable animal resources traditionally associated with oak savanna include white-tailed deer, elk, badger, woodchuck, eastern cottontail, coyote, bobcat, red fox, ruffed grouse, prairie chicken and the box turtle (Higgins 1990:111).

Oak forest comprised the area along the riverbank on which the site is presently located as well as the area immediately across the river channel to the south (Brewer et

al. 1984). Oak forest is characterized by a canopy of more than 15 trees per acre and is dominated by white oak. The composition of oak forest is similar to oak savanna with smaller amounts of yellow, black and bur oak. A notable addition to oak forest are small numbers of red oak (Brewer et al. 1984). In the Middle St. Joseph River, wild cherry, pignut hickory and shagbark hickory were probably lesser constituents of oak forest, based on their presence in similar environments in Wisconsin (Knapp 1992:36). Several undergrowth species and shrubs, including False Solomon's seal, wild geranium, gray dogwood, hazel nut, Virginia creeper, gooseberry and blackberry, may also have been present.

Immediately to the west of the Dieffenderfer site is an area identified at the time of presettlement as bur oak openings and beech-sugar maple forest (Brewer et al. 1984). Bur oak openings support from 1 to 15 trees per acre and are comprised almost exclusively of pure stands of bur oak. These stands were located on the edge of prairies and were also associated at times with wet prairie vegetation. These associations may have also been proximal to wet areas in floodplain locations and accompanied by either floodplain forest or wet prairie ground cover. Dominant groundlayer species included flowering spurge, bastard-toad-flax, horse mint, rose and fern (Knapp 1992:34).

Beech-sugar maple forests are characterized by a predominance of beech and sugar maple and lesser amounts of basswood, American elm, slippery elm, white ash, bitternut hickory, shagbark hickory, ironwood, tulip tree, and blue ash (Brewer et al. 1984). Other species common to this association include the red elm, green ash, red maple, poplar, black cherry, red oak, black walnut, butternut, hackberry, white oak, sassafras, sycamore and black ash (Ebberts 1990:90). Important groundlayer and shrub species included sweet cicely, may apple, wild leek, wild geranium, False Solomon's seal, spicebush, maple-leafed viburnum, fly honeysuckle, witchhazel, prickly gooseberry and the common greenbriar (Ebberts 1990:88-90; Knapp 1992:38). One of the most

significant aspects of the beech-sugar maple forest is the spring ephemerals known for their edible underground storage organs. These include the yellow troutlily, squirrel-corn, Dutchman's breeches, spring beauty and toothwort. Important animal resources commonly included the white-tailed deer, black bear, gray wolf, gray fox, cougar, striped skunk, raccoon, gray squirrel, fox squirrel, wild turkey, and passenger pigeon (Higgins 1990:109-110).

The St. Joseph River, itself, was no doubt an important draw for the Dieffenderfer inhabitants given its location immediately adjacent to the site. In addition to the main river floodplain, which would have provided a number of riparian plant species, this river system was probably an invaluable source of exploitable aquatic species including beaver, muskrat, river otter, mink, several species of turtle and fish (including the largemouth bass, rock bass, smallmouth bass, bowfin, bullhead, catfish, crappy, freshwater drum, lake sturgeon, longnose gar, northern pike, suckers, sunfish, walleye, yellow perch) as well as ducks, geese and freshwater mussels (Higgins 1990:109-110).

Site Background and Excavation History

Past activity is visible at the Dieffenderfer site. The site is most notable for a shallow, oval-shaped ditch which is estimated to enclose an area of approximately 4,000 square meters (Cremin and DesJardins 1994:6). The nature and function of this ditch is poorly understood at the present time. At the eastern end of the site, within the confines of the ditch enclosure, historic activity is visible in the form of a trash pit and a trench and earthen ramp complex utilized by loggers to move timber onto trucks. More recent activity is evident in the western portion of the site by a series of depressions, created by a backhoe and blade machine. According to the landowner, this series of excavations was conducted within the last ten years or so by a neighbor of Mr. Dieffenderfer in an attempt

to establish this site as the location of an early 19th century Indian village believed to have been located in the area. Disturbance from this uncontrolled excavation was visible in many of the test units located in this area of the site (Cremin and DesJardins 1994:6-7). In this same area, a series of hand excavated pits by the landowner's nephew, Mr. Steve Jones, is also visible. Mr. Jones recovered a substantial quantity of ceramic material, as well as smaller amounts of lithic tools, during the excavations.

The Dieffenderfer site was excavated by the Western Michigan University archaeological field school under the direction of Dr. William Cremin in the spring of 1993 and 1995. A total of 127 test units were excavated over these two field seasons, totalling approximately 234 square meters of earth (Figure 5). Investigations initially commenced at the site in May of 1993 with limited shovel testing within the confines of the ditch and along lines to the north and west of the main site area. These shovel tests were conducted in order to delineate the approximate boundaries of the site. Lithics and ceramics were recovered from the main area of the site, but all shovel tests outside the ditch were culturally sterile. In the absence of any cultural material outside the immediate area enclosed by the ditch it was decided that attention be focused on the area enclosed by the ditch where previous excavations by Mr. Jones had been particularly productive.

Following establishment of a datum, a series of lines with corresponding control points was established in a north, south, east and west direction using a transit and magnetic north as a reference point. From these lines a series of test units was established across the southern half of the area within the ditchline. Given the history of disturbance at the site, both random and judgmental sampling was utilized to determine placement of the test units in this area of the site. The excavation of test units proceeded in arbitrary 10 cm levels, given the absence of observable stratigraphy. Soil was sifted through 1/4" mesh screen. The cultural material recovered from each test unit was recorded by type on unit forms and then placed in a bag labeled with the appropriate

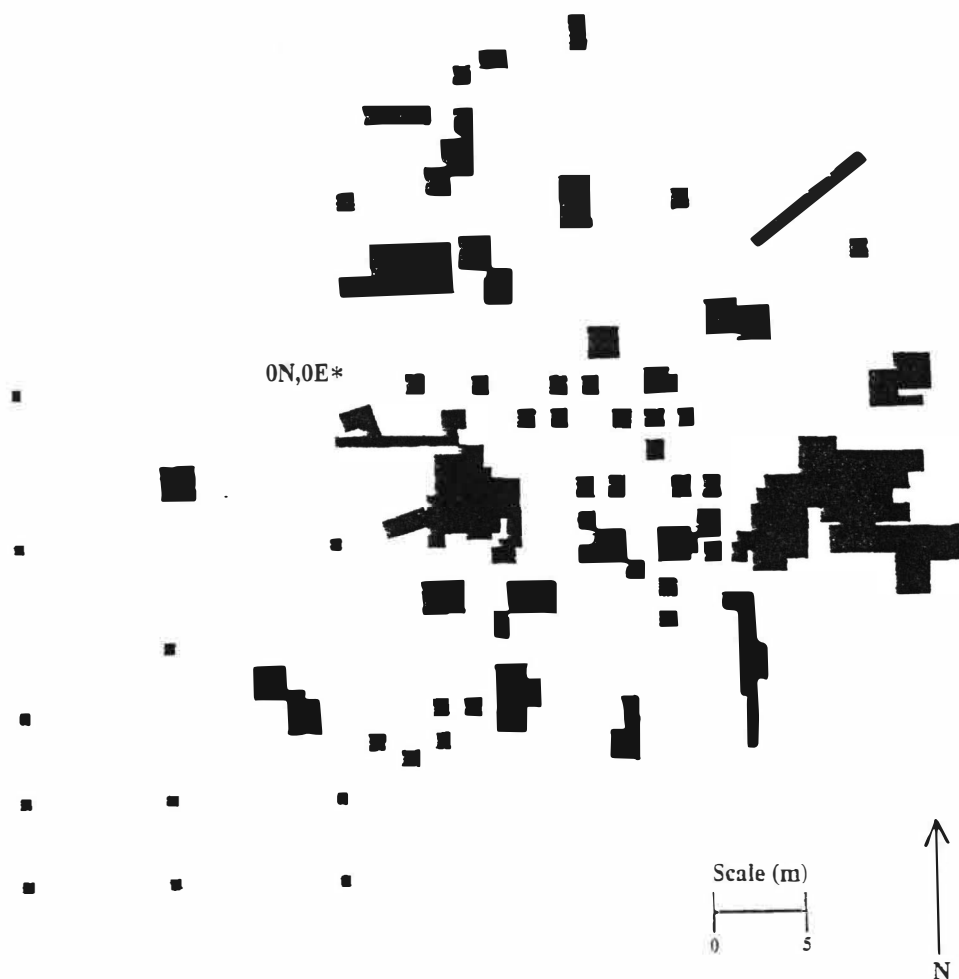
Dieffenderfer Site**(20SJ179)****St. Joseph Co.****Michigan****■ Excavated Test Unit**

Figure 5. Excavation Units at the Dieffenderfer Site, 20SJ179.

provenience.

Fifty five test units were established during the 1993 field season (Cremin and DesJardins 1994:7). Save for 6 of these test units, all were within the area delimited by the ditch. However, of the 55 test units established, only 51, comprising approximately 110 square meters of site area, were excavated. Ten of these were placed at various intervals across the path of the ditch line, most often in those areas where the shallow, linear ditch-like depression was not visible on the surface. Eight revealed evidence of the ditch in profile at approximately 10-30 cm below the surface. The dimensions of the ditch, following cross-sectioning, range in width from 27-152 cm (mean width= 102 cm) at its plane of origin to a depth of 17-49 cm (mean depth= 33.4 cm). Those two remaining units which displayed no evidence of the ditch line were both located on the upper slope of the riverbank where, it is suggested, periodic flooding and erosion activity over time has permanently disturbed, if not destroyed, any evidence of the ditch in this area of the site (Cremin and DesJardins 1994:7).

In all cases, soil profiles did not reveal evidence of an associated structure or structures, such as a fence or palisade, in the bottom of the ditch or to either side of its path. The initial indication is that the ditch had subsequently filled naturally following its initial construction (Cremin and DesJardins 1994:7). Cultural remains were noticeably absent from the context of ditch fill save for some light lithic and ceramic remains. Following its visual confirmation, the ditch was designated as Feature 1.

The majority of the cultural items recovered during the 1993 field season (including lithic and ceramic debris) were found in those test units located inside the enclosure (Cremin and DesJardins 1994:7-8). Conversely, the six units placed outside the confines of the ditch proved to be culturally sterile, save for some light lithic debris and/or a fragment of FCR. Temporally sensitive lithic artifacts recovered from inside the ditch included an Archaic bifurcate base projectile point of the LeCroy cluster, side-notched

and corner-notched or expanding stem forms attributable to the Early and Middle Woodland periods and a predominance of triangular forms of the Late Woodland Madison cluster (Cremin and DesJardins 1994:10). While most of the test units excavated during the 1993 field season produced variable quantities of ceramics, the area of highest concentration of ceramics was at the western end of the enclosure in the immediate vicinity of Test Unit 53.

In Test Unit 53, at approximately 10 cm below the surface, excavation revealed a zone of heavily oxidized, reddish-black soil accompanied by a dense concentration of pottery, bone and FCR. Further delineation of this soil stain suggested the presence of a relatively undisturbed sub-rectangular housefloor. This structure, designated Feature 4, was roughly 3 m x 5 m with its long axis oriented in a NE-SW direction. Four postmold stains were visible on the surface with three running in a linear fashion along the centerline of the structure and the fourth running along its southeast side. In addition to the postmolds, two features were observed in association with this structure.

Feature 4-A, identified as a rock hearth, was located in the center of the housefloor near the southwest end along with numerous pieces of ceramics and FCR. Contents of this feature were sampled for flotation. A radiocarbon sample was not submitted for analysis given inadequate amounts of carbonized material. Feature 4-B, located immediately north of the hearth, was identified as a shallow, basin-shaped pit containing charcoal, bone, and ceramic fragments (Cremin and DesJardins 1994:8). This feature was heavily disturbed by the roots of a beech tree located immediately adjacent to the test unit. This feature was sampled both for flotation and radiocarbon analysis. A radiocarbon sample was submitted to Beta Analytic and yielded a date of 840 ± 60 BP: A.D. 1110 (Beta-76073). This date, following calibration, becomes A.D. 1222 with a one sigma range of A.D. 1165-1276 (Stuiver and Reimer 1993). A preliminary analysis of the flotation samples from the 1993 housefloor area has yielded a substantial quantity of

nutshell and faunal remains including lone bone fragments (possibly deer), sturgeon and turtle (Arthur DesJardins, personal communication). For comparative purposes, the 1993 structure and its associated features, together with the abundance of ceramic material in this area of the site, are designated as Zone A. This was done in order to facilitate comparison of the ceramic assemblage and to help delineate spatial patterns at the site.

Following a two year absence, the Western Michigan University archaeological field school returned to the Dieffenderfer site in the spring of 1995. The goals of this investigation were to focus on those areas of the site that had not been adequately addressed during the 1993 field season. Specifically, this involved further delineation of the boundaries of the site, including the ditch itself and a search for additional pits and hearths and possible structures at the site, with an emphasis on those areas of the site seemingly oriented toward lithic tool production (William Cremin, personal communication).

In an effort to further delimit the boundaries of the site, a series of shovel tests were completed west of the site to the property line, aggregating an area of approximately 43,700 square meters (or 4.37 hectares). During these shovel tests no prehistoric cultural material was recovered. With this in mind, investigative efforts commenced within and immediately adjacent to the ditch. In sum, 69 additional test units were established at the site; with 68, comprising approximately 124 square meters, being excavated. Fifteen test units, ranging from 50 cm x 50 cm to 2 m x 2 m in size, were placed to the west of Feature 4 just outside the ditch in order to evaluate the potential of this area. These test units were culturally sterile apart from a few lithic and/or ceramic fragments and an occasional piece of FCR, strongly supporting our earlier contention that habitation was largely confined to the area enclosed by the ditch.

The remaining 53 test units were placed inside the ditch line. Prior to termination of fieldwork, several of these test units were placed strategically across the ditch to further

expose this feature for study. Testing in these areas suggested a hiatus or break in the ditch line at various intervals. In the process of refining our interpretation of the ditch and the nature of lithic activity as ascertained in 1993, several new features were identified at the site. These features tend to cluster in two main areas of the site. They will be referred to in this analysis as Zones B and C. Both of these zones are noted for substantial quantities of ceramic material and are worthy of mention here. A list of those additional features identified in 1995, as well as their proposed function, is provided in Table 1 in Appendix A; their spatial distribution is illustrated in Figure 6.

Zone B is located at the extreme eastern end of the ditch. This zone contained two clusters of features. The first cluster suggests a small occupation of the site at or around A.D. 1000. One of these features, Feature 9, defined as a bark-lined, cylindrical storage pit, was sampled for radiocarbon analysis and yielded a date of 990 ± 60 BP (Beta-89953). This date, following calibration, becomes A.D. 1025 with a range between A.D. 1004-1156 (Stuiver and Reimer 1993). This feature contained little in the way of cultural material and is nearly identical to another feature located nearby, identified as Feature 12, in terms of its morphology, suggesting the two are possibly contemporaneous.

The second cluster of features in Zone B suggests a later occupation of this area of the site and is most notable for the remains of another structure (Feature 16) containing a central hearth, several groups of postmolds and a substantial quantity of ceramic debris. Feature 16-B, a small hearth, contained fragments of charcoal and the remains of a turtle. A charcoal sample obtained from the feature yielded a radiocarbon date of 620 ± 70 BP: A.D. 1330 (Beta-89954). This date, after calibration, provided a one sigma range of A.D. 1295-1408, with multiple intercept ages of 1315, 1347, and 1390 (Stuiver and Reimer 1993). A preliminary sort of the flotation samples taken from the housefloor is still in progress, but the initial indication is that this area is much “cleaner” than the 1993

Dieffenderfer Site
(20SJ179)
St. Joseph Co.
Michigan

● Cultural Feature

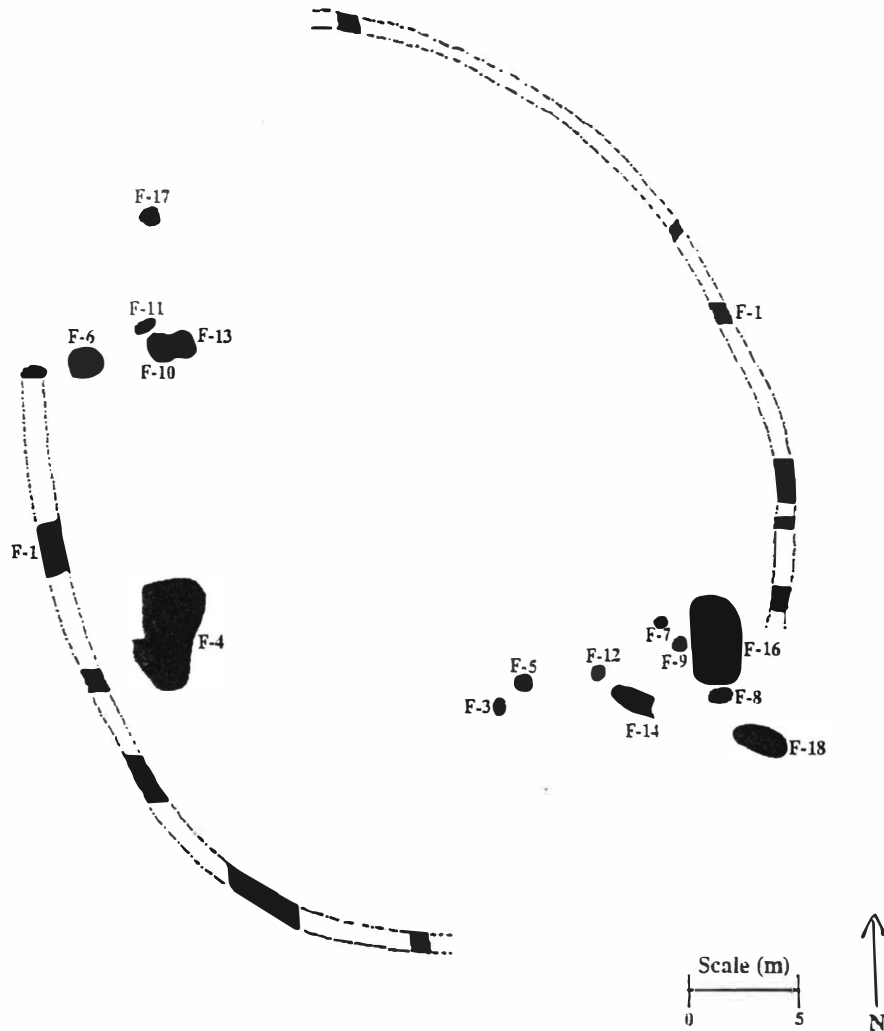


Figure 6. Distribution of Features at the Dieffenderfer Site, 20SJ179.

housefloor, displaying smaller quantities of bone fragments and lacking evidence of carbonized nutshell (Arthur DesJardins, personal communication).

Zone C is located to the north of Zone A in the northern area of the site. This zone is noted for a cluster of three features (Features 10, 13, and 17) and smaller quantities of ceramic material. Presently, these features remain undated so their exact temporal placement is unknown. However, the results of the ceramic analysis will better define their cultural and temporal placement, as they contained materials similar to the other two zones referenced above. No evidence exists in this area of the site an accompanying structure as were present in Zones A and B. The relationship of this area to Zones A and B will be further tested when the archaeological field schools return to the site in the spring of 1997.

CHAPTER III

METHODOLOGY AND TECHNIQUE

Methodology

This section describes the theoretical approach as well as the methodology and technique utilized in this study. As stated in the introduction, the primary goal of the analysis is to produce a classification of the ceramics from the Dieffenderfer site which can be used to make intra-site comparisons and develop hypotheses to account for variation within the assemblage.

A classification is defined as “the grouping or ordering of similar entities” (Rice 1987:274). The goal of a classification is to produce groups whose members have a high degree of similarity accompanied by a low level of between-group homogeneity. This approach is based on the principle that the overall similarity between members of a group is not dependent on random chance but rather is representative of the inherent nature of its members. Classification differs from the process of identification in that new groups are produced for a series of objects or entities rather than simply allocating them to a set of previously established categories (Romesburg 1984:33).

The most common approach to classifying a group of objects are formal classifications. Formal classifications are useful for several reasons: they provide a structure for scientific inquiry, creating a system by which a group of objects can be described or a set of data can be summarized; they help to facilitate communication amongst researchers through the use of established terms and nomenclature; and they serve as a means by which hypotheses can be generated and further tested by researchers (Doran and Hodson 1975:159; Rice 1987:275). It is with these uses in mind that an

attempt is made to classify the ceramic assemblage from the Dieffenderfer site.

The goal of most classification systems in archaeology is to create artifact “types” (Rice 1987:275). There are two main perspectives on what constitutes a type. The first of these perspectives, referred to as the “creationist position,” suggests that types are abstract concepts created and imposed by the researcher on a group of objects as a means of ordering and understanding. One of the main proponents of the creationist perspective was Ford (1938, 1953), who believed types were analytical constructs created by researchers in order to build chronologies and to better understand cultural change and development.

In contrast, the “discovery position” argues that artifact types are natural in any archaeological data set and therefore only need to be discovered or recognized by the researcher. The first component of the discovery position, espoused by Krieger (1944, 1965), Spaulding (1953a, 1953b), and Taylor (1948), among others, is the idea that types are culturally and historically real, reflecting both the ideas, values and cultural rules of a group, as well as containing a specific historical meaning (Krieger 1944:271-288). Put another way, the structure of a given set of material objects (i.e., artifacts) is culturally sanctioned and patterned at a given point in space and time. Thus, according to the discovery perspective, in order to establish a classification system for a given set of artifacts, such as pottery, it is first necessary to attempt to understand how these objects are structured both in a spatial, temporal and cultural context.

The second component of the discovery position is the idea that a type may also be representative of the craftsman’s own preconceived notions of the modal form of an artifact prior to its manufacture (Deetz 1967:45-46). In other words, the idea of the proper form of the artifact, conceived as a kind of mental template, exists in the mind of the artisan prior to its initial construction. This template becomes manifest when raw material is used to produce an artifact. The actual form of the artifact is a close

approximation of this mental template; any variation in a group of similar objects thus reflects the range of variation in the ideas producing them.

A type (or class, as it is sometimes called) is also inherently either monothetic or polythetic in nature (Sokal and Sneath 1963:13-14). A monothetic class is defined as a group of objects that is defined exclusively by the possession of a unique set of attributes or characteristics that is both sufficient and necessary for inclusion in the class (Brashler 1981:232; Whallon 1971:1-2). Monothetic classes are formed by the process of monothetic subdivision. Monothetic subdivision is a hierarchical arrangement of classes created by subdividing a sample or set of objects into increasingly smaller and smaller subsets or groups. There are three main principles by which monothetic subdivision operates.

The first principle of monothetic subdivision is the principle of shifting criteria. This principle states that the attributes which define a particular type are essentially free to switch from one type to the next. The second principle, defined as the principle of hierarchy of importance, states that some attributes are more significant than others in establishing a classificatory system, and the order in which they are considered is free to change at each step in the development of the classification. The last principle of monothetic subdivision refers to the principle of definability of types. This principle states that the types defined by monothetic subdivision are clearly defined, meaning all members of the type possess all the attributes used to define the type. The primary advantage of monothetic subdivision for the researcher relates to this last principle. The main disadvantage to a monothetic approach is that variation within the type is compromised at the expense of defining specific artifact types (Brashler 1981:232; Clarke 1978:36).

Conversely, a polythetic class is conceived as a group of objects whose members possess a large number of attributes, whose attributes are shared by a large number of the

objects in the class, and no single attribute is both sufficient and necessary for class membership (Brashler 1981:232; Clarke 1978:36). Polythetic classes are produced by the method of polythetic agglomeration. This method works by grouping or agglomerating entities into larger and larger groups to the point that all are components of one class. The main advantage of the polythetic agglomerative method for developing classifications is that it does not produce groups that are all-inclusive, rather it creates groups which are reflective of the variation which is present in both natural and archaeological entities (Clarke 1978:36; Sneath and Sokal 1973:23). Thus, unlike the monothetic approach, polythetic agglomeration weighs all variables equally during analysis of the data, and no one attribute necessarily “defines” the class. Clarke (1968:38) concludes “the best model for most archaeological entities is a polythetic model of some kind.” The primary disadvantage of polythetic agglomeration is that in the process of allowing for the full range of variation within a group of entities the precise definition of types is compromised.

Polythetic agglomeration was chosen as the most desirable method for producing a classification of the ceramics from the Dieffenderfer site. The polythetic agglomerative approach utilized in this analysis is cluster analysis. Cluster analysis is a multivariate statistical computer procedure that groups entities by their similarity on a number of attributes or variables (Rice 1987:285). The objective of a cluster analysis is to identify homogeneous groups of objects, or clusters. Cluster analysis works in a hierarchical fashion by combining objects into bigger and bigger clusters until all objects are members of a single cluster. The output that is generated by a cluster analysis is typically a dendrogram, a tree-like graph that displays a series of linkages of the objects based on their affinity (i.e., similarities and differences) to one another (Doran and Hodson 1975:175-176).

A cluster analysis begins by converting the data recorded for a series of objects

or entities into a data matrix using a statistical software program (Romesburg 1984:10). The data matrix consists of both a list of objects and variables. In the case of this analysis, the objects in the sample are individual vessels and the variables refer to specific vessel attributes. The data matrix also includes descriptive information about each object in the sample, indicated by its value or score in a particular attribute category. Once completed, the data matrix is converted into a similarity or distance matrix; this conversion is completed by choosing a resemblance coefficient (Romesburg 1984:12).

In cluster analysis a resemblance coefficient may be either a similarity or dissimilarity coefficient (Romesburg 1984:12). Resemblance coefficients are used to evaluate the degree of similarity or dissimilarity of objects in the matrix. The dissimilarity (or distance) between two objects is a measure of how far apart two objects are in terms of their attributes, whereas the similarity measure is a measurement of nearness, or similarity. When it is computed, the coefficient is displayed in the matrix numerically. For instance, when two objects being compared are very similar, the corresponding similarity measure would be large and the distance measure would be small; conversely, if two objects being compared are very dissimilar in their properties, the similarity measure would be small and the distance measure would be large. This is an important principle in cluster analysis because objects are clustered based on their relative closeness to one another. A variety of similarity and distance measures can be used in performing the cluster procedure. The coefficient used in this analysis was squared Euclidean distance. Squared Euclidean distance is a measure of the distance between two objects or entities and is defined simply as the sum of the squared differences in values for each variable.

Once the distance matrix has been computed using a resemblance coefficient, a clustering method (or algorithm) is chosen to begin the cluster process. For this analysis, Ward's method (also referred to as minimum variance or incremental sum of squares

method) was chosen (Ward 1963:237). This method works by calculating a statistical mean for the variables of each cluster during the clustering routine. Following this step, the squared Euclidean distance for each object to the cluster means is compared and then the distances are summed for each object. At each step of the procedure, the two clusters that merge are those yielding the smallest increase in the overall sum of the squared within-cluster distances. This method has been used effectively in classifying ceramics because it is strongly clustering (Clifford and Stephenson 1975:106, 114).

After a similarity or distance matrix has been established and a clustering algorithm applied, the statistical program displays output in the form of a dendrogram. A dendrogram is a tree-like graph that demonstrates successive linkages of similar objects or entities (Rice 1987:285). The actual form of the dendrogram is created by connecting the distances between the clusters. The dendrogram can be used to interpret the number and type of clusters formed by the clustering routine. At the top of the dendrogram is a scale of distance that is a measure of the similarity or dissimilarity between each cluster formed. These measures are computed statistically using the cluster algorithm. To determine the clusters that might best represent a type it is necessary to use the distance scale to establish at which point(s) on the dendrogram the “tree” should be “cut.” This is easily established by determining the points on the dendrogram where the distances are greatest between clusters (i.e., where within-group similarity and between-group dissimilarity is highest). Where the tree is cut ultimately forms the basis for the type definitions, which can be used as a framework for the classification.

Technique

Following their initial recovery, the ceramics from the Dieffenderfer site were cleaned and sorted based on test unit, level and feature number. The total number of

sherds were recorded according to provenience and then further identified, counted, and separated by type to facilitate analysis of the assemblage. In aggregate, a total of 6,905 ceramic sherds were recovered during the 1993 and 1995 field seasons at Dieffenderfer. Of this total, 6,540 (or 94.7%) were identified as body sherds and 365 (or 5.3%) were identified as rim sherds. After sherds were separated and counted by type, each sherd was analyzed and classified according to a set of variables or attributes.

The body sherds in the sample were analyzed according to specific attributes such as temper type, temper size, exterior and interior surface treatment and the presence or absence of decoration. In some instances, body sherds in the assemblage were considered either too small or too eroded to be accurately evaluated in terms of specific attribute criteria. These sherds were listed as “indeterminate.” Those sherds which could be confidently evaluated were analyzed and their individual attributes recorded.

The criteria used in the analysis of the rim sherds from the site were more extensive than those used in the analysis of body sherds. The reason for this is that rim sherds in general are more informative and diagnostic than body sherds. Rim sherds were first grouped according to visual similarities. In a few cases, rim sherds from a particular test unit were matched with sherds recovered from another test unit or feature or with those sherds recovered by Mr. Jones. In order to better facilitate vessel reconstruction and analysis of individual vessels, these cases were noted and an attempt was made to re-attach these sherds. Only in a minority of cases could body sherds confidently be matched or subsumed with individual vessels, given the relative homogeneity in the assemblage. In addition, most vessels in the assemblage were represented by single rim fragments as opposed to large rim sections, limiting the analysis to the upper rim area of the vessel.

The next step in the analysis of the assemblage was to establish a minimum vessel count for the Dieffenderfer site as a whole. This involved both an estimate of the total vessels represented in the 1993/1995 ceramic sample as well as those represented in the

collection recovered by Mr. Jones. The sample of 365 rim sherds recovered during the 1993/1995 season were first sorted by similarity into groups, fitted and then re-attached. In aggregate, the 365 rim sherds comprise a total of 205 individual rim sections. Of these 205 rims, 44 (or 21.5%) were considered inappropriate for further analysis due to their small size and/or condition and were therefore eliminated from the analysis. The remaining rims in the sample, 161 (or 78.5%), were considered sufficient for future analysis and classification. Working with these 161 rims, a minimum estimate of 80 vessels was established. This vessel estimate does not include three vessels in the sample represented exclusively by body sherd fragments, bringing the total vessel count to 83 vessels.

In addition to the 83 vessels estimated for the 1993/1995 assemblage, a total of 64 rim sherds was identified in the Jones' collection. Following an initial sort, many of these rim sherds were subsumed and/or re-attached with existing vessels in the 1993/1995 sample. The remaining rim sherds in the collection comprise a total of 35 individual rim sections. Of these 35 rims, 10 (or 28.6%) were considered too small for analysis, leaving a remainder of 25 (or 71.4%) which could be further analyzed and classified. From these 25 rims a minimum vessel estimate of 11 was established. This figure does not include one vessel represented by two body sherds in the collection, bringing the minimum vessel count for the Jones' collection to 12 vessels.

Combining the 1993/1995 excavated sample and the Jones' collection produces 95 minimum vessels for the site. Of these 95 vessels, 17 were immediately removed from the cluster procedure due to missing data and/or their irrelevance to the study. This figure includes eight miniature or "finger" pots represented by very small and rather non-distinct rim sherds, five probable Middle Woodland vessels, three vessels of Mississippian origin and one unclassified vessel represented exclusively by two small body sherd fragments. These vessels were not included in the cluster procedure due to the goals of

the analysis and the likelihood that they would skew the results. The occurrence of these vessels are, however, worth describing because they indicate other temporal and cultural issues beyond the scope of the cluster analysis. A description of these vessels, as well as their possible significance at Dieffenderfer, will be included in the following sections. With these vessels eliminated, a total of 78 vessels were selected for the cluster analysis.

After a minimum vessel count was established for the site, it was necessary to analyze each vessel. To facilitate analysis, each vessel was assigned a vessel number. An attribute list was used to record information for each vessel. This attribute list was constructed based on a review of past ceramic analyses conducted in the region an to capture the full range of variation present in the assemblage. It was also necessary to produce an attribute list that could be easily converted into a data matrix for use in the cluster analysis. To accomplish this task, each attribute class for every vessel used was coded numerically (i.e., scored) based on its attribute state. In all cases, a vessel may possess only one attribute state from an attribute class, thus these attributes are multi-state nominal scale data.

Those attributes considered relevant for use in the analysis include temper type and size, exterior and interior surface treatment, the presence or absence of decoration, rim profile, the presence or absence of rim thickening, rim thickening technique, rim height, estimated rim diameter, lip profile, lip plan view, lip preparation, the presence or absence of lip decoration, lip thickness, and collar thickness. Those attributes that were recorded during the analysis but eliminated from the cluster procedure due to their perceived irrelevance to the analysis include color and the presence or absence of food char. Paste type, hardness, method of manufacture, vessel shape and function were not recorded simply because they were so difficult to assess in the majority of cases. In sum, a total of 33 attributes were recorded and used in the cluster procedure. Following analysis and recording of vessel attributes, the data was entered into a statistical computer

program which could accommodate the cluster analysis. For this task, the SPSS statistical software package was chosen. All statistical procedures were run at Western Michigan University's Computing Services.

CHAPTER IV

THE DIEFFENDERFER CERAMICS

The primary goals of this section are to present the results of the cluster analysis and to produce a classification (i.e., typology) of the ceramic material from the Dieffenderfer site. This is necessary in order to determine the spatial and temporal distribution of specific ceramic wares (and types) at the site, to interpret the cultural history of the main occupations at Dieffenderfer and to delineate patterns of social interaction through time.

The typology presented here is based both on the results of the cluster analysis and a review of previously established ceramic wares in southwestern Michigan and adjacent areas. The ceramic material from the site is compared to existing ceramic wares and types previously established for southwestern Michigan and adjacent areas. Ware and type names attributable to other areas of the Midwest-Great Lakes region (including areas outside Michigan) are used in those cases where similar material has been identified in the assemblage.

Cluster Analysis Results

The results of the cluster analysis are presented visually as a dendrogram. The dendrogram produced during the cluster analysis is presented in Figure 7. The most distinct part of the dendrogram is the split in the sample that occurs between five ceramic clusters (consisting of 18 vessels) at the bottom left of the tree, and three clusters (consisting of 60 vessels) at the bottom right. Each of these clusters is significant in terms of establishing a useful typology. The dominant attributes of each of these clusters change

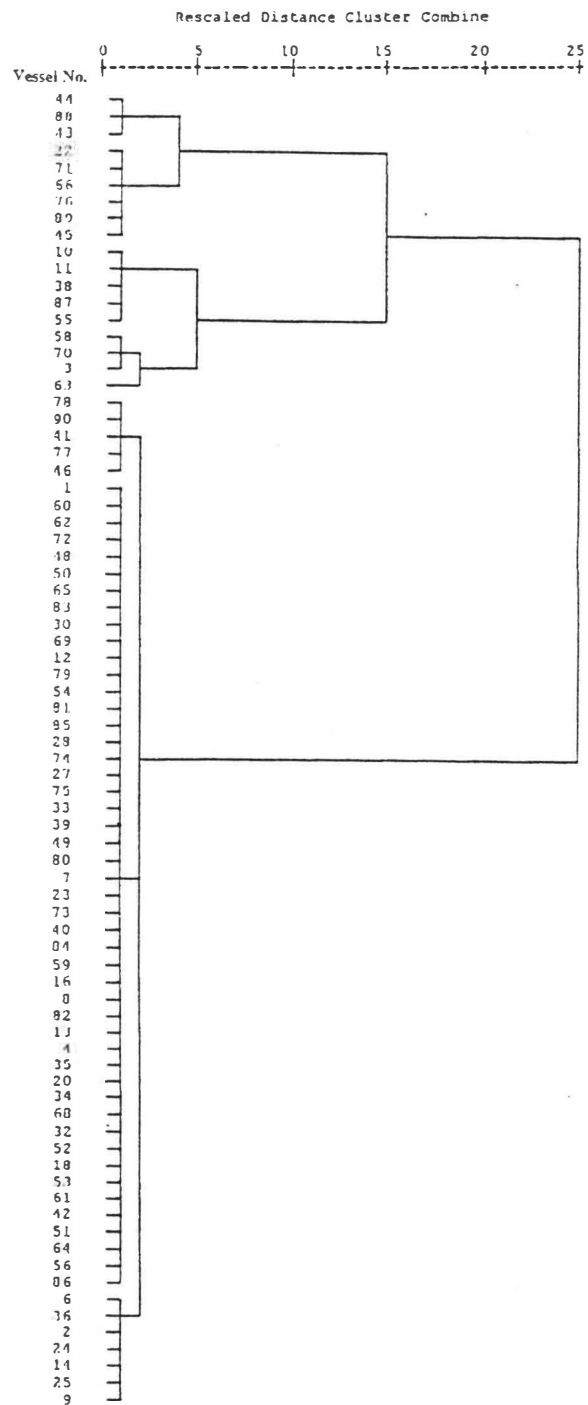


Figure 7. Cluster Analysis Dendrogram Using Ward's Method.

as one moves vertically or horizontally on the dendrogram. It is the dominant attributes of each cluster which essentially define the group and form a basis for establishing type definitions. The types established by the dendrogram can be delineated by determining where the tree should be cut and identifying those clusters which appear most likely to represent individual ceramic groups (or types). As discussed previously, this is indicated by those points on the dendrogram where within-group homogeneity and between-group heterogeneity is greatest.

The most logical point to cut the tree formed by the cluster run is between 6.0 and 8.0 on the distance scale (indicated to the left of the dendrogram); this is an optimal point to cut the tree because at this point on the dendrogram the clusters formed are usable as types and distances between the clusters are not as great when compared to those formed later in the cluster procedure. Beyond this point the clusters begin to lose their defining characteristics as clusters formed during previous stages are agglomerated and overall group size and heterogeneity increases. As a result, it becomes increasingly difficult to define specific types as clusters from previous stages are joined together and within-group homogeneity diminishes. This will become more apparent during a discussion of the clusters formed at various stages in the cluster procedure.

Stage 1

Stage 1 in the cluster analysis is indicated in the dendrogram at a distance of approximately 1.0. At this distance, eight ceramic clusters were formed. These are represented at the bottom of the dendrogram. In each case, some attributes are not pertinent (i.e., irrelevant) in cluster definition because they are missing from the cluster or are absent in some cases. Each cluster is described below in terms of its dominant, or defining ceramic attributes.

The first cluster formed during stage 1 consists of three vessels (Vessels 43, 44, 88) which share 21 attributes in common. Of these, 14 define the cluster and seven are considered irrelevant. Those attributes which define Cluster One are as follows: presence of exterior decoration on the rim (in the form of a single row of oblique decoration); absence of exterior decoration on the neck; absence of decoration on the interior rim and neck region; absence of decoration on the lip; absence of secondary neck decoration; vertical surface preparation on the neck exterior; flat, castellated lips; vertical rim profile; rim thickening in the form of a rolled/folded collar; and temper consisting of a mixture of black and white grit. When decoration is present on the exterior rim/collar area, it is produced by either impressing the end of a sharp, pointed implement in a push-pull-like manner (two vessels) or pressing the edge of a corded tool into the wet clay (one vessel). These vessels most frequently exhibit plain/smooth rims, lips and interiors, cordmarked necks, and fine grit temper. The thickness of the lip ranges between 4-6 mm, rim height is under 15 mm, and collar thickness is between 6-10 mm. Rim diameter could not be accurately determined in the majority of vessels analyzed.

The second cluster is comprised of six vessels (Vessels 22, 45, 66, 71, 76, 89). These vessels have 17 attributes in common, of which 13 define the cluster and four are considered irrelevant. Defining Cluster Two are: exterior decoration on the rim and lip utilizing a corded tool; absence of decoration on the neck and interior areas of the vessel; vertical surface preparation on the neck; vertical rim profile; rim thickening in the form of a rolled/folded collar; and coarse grit tempering. Decoration occurs most frequently on the rim as a single row of decoration, applied in either a vertical or oblique manner, using a punctate or impressed technique. On the lip, decoration is a continuation of the rim motif, produced by impressing or punctating, and is applied either parallel, oblique or perpendicular to the lip. These vessels most frequently are cordmarked on the exterior rim and neck area in a vertical fashion, exhibit plain/smooth interiors, display plain,

flattened lips, are either flat or castellated in planview, and are tempered with a mixture of black and white grit. In general, collar thickness is greater than 15 mm, the lip between 4-6 mm, rim height between 16-30 mm and rim diameter ranges from 16-30 cm.

The third stage one cluster consists of five vessels (Vessels 10, 11, 38, 55, 87) having 21 attributes in common. Of these, 14 define the cluster and seven are considered irrelevant. Those attributes which define Cluster Three include: exterior decoration on the neck consisting of a horizontal motif produced with a sharp, pointed tool; absence of exterior decoration on the rim, lip and interior of the vessel; vertical exterior surface treatment on the rim and neck; flat (i.e. uncastellated) lip; vertical rim profile; rim thickening in the form of a collar; rim height between 16-30 mm; and collar thickness between 11-15 mm. Decoration occurs most frequently on the neck as a row(s) of horizontally trailed line(s) immediately below the collar. The single exception is a vessel with a horizontal row of punctates at the base of the collar accompanied by a single horizontally trailed line below the punctates. The tip of a pointed tool or object appears to have been used to create the decorative motif on these vessels. They are most frequently characterized by cordmarked or smoothed over cordmarked exteriors, smoothed over cordmarked and flattened lips, and either rolled/folded or molded collars. Lip thickness ranges between 4-6 mm. Rim diameter could not be determined. Temper is mostly coarse and is comprised of a mixture of white and pink grit, with minor occurrences of white grit, mixed black and white grit, and black grit.

The fourth cluster created is composed of three vessels (Vessel 3, 58, 70). These have 14 attributes in common, all of which define the cluster, and include: exterior decoration on the rim/collar and the neck in the form of an oblique motif; corded tool impressions on the rim; absence of interior rim decoration; vertical surface treatment on the neck; castellations; vertical rim profile; rim thickening in the form of a molded collar; absence of secondary neck decoration; and temper consisting of black and white grit.

Decoration most frequently occurs on the rim as a single row of oblique impressions created with a corded tool. On one vessel, however, the obliques have been opposed so as to form a right-pointing chevron-like motif. The tool and decorative method used on the neck area appears to vary somewhat from that used on the rim. On the vessel with chevron rim decoration, the same tool has been used to create a single row of oblique impressions immediately beneath the collar. On another vessel, the tip of a corded tool has been applied just below the collar to create a horizontal row of oblique punctate-like impressions. The last vessel exhibits trailing created by dragging the end of a pointed tool across the neck in an oblique manner. Lip decoration is absent from this cluster save for this same vessel which has been impressed with a cordwrapped cord. The cord impressions run parallel to the lip margins and encircle the lip of the vessel. It also displays interior decoration on the neck in the form of a series of vertically oriented cordwrapped tool impressions, which duplicate the dominant motif on the exterior rim area. Vessels are vertically smoothed over cordmarked on the exterior rim and neck area and plain/smooth on the interior and lip areas. Lips are predominantly flat in profile, but with one vessel featuring rounded lips. Temper is predominately coarse. Collar and lip thickness vary, rim height is generally over 30 mm, and rim diameter ranges between 16-30 cm.

The fifth cluster formed during this stage consists of a single vessel (Vessel 63). It is defined by a unique constellation of attributes including: presence of exterior decoration on the rim in the form of a horizontal row of hollow reed-like punctates; exterior decoration on the neck in the form of complex incising; decorated lip using an incised crosshatched motif; interior decoration on the upper rim and neck areas in the form of crosshatched incising; castellation; everted rim profile; molded collar; and a mixture of black and white grit temper. Because this vessel is unique, a more complete description and discussion are presented below.

The sixth cluster is comprised of five vessels (Vessels 41, 46, 77, 78, 90) having

14 attributes in common, of which three are considered relevant. Those which define Cluster Six include: absence of interior decoration on the rim and lip and a flat (i.e., uncastellated) lip. One vessel displays exterior decoration on the upper rim area in the form of series of vertically oriented impressions produced with a plain circular tool. It is included in this cluster because it lacks a collar (as do most vessels in this cluster), is uncastellated, exhibits a rounded lip and the decorative technique is unlike others in the assemblage. Vessels are most frequently smoothed over cordmarked in a vertical fashion on the exterior. Lips tend to be plain/smoothed. Interiors are similarly treated. Lips typically are flat in profile, although two cases of rounded lips do occur. Rims are mostly vertical in profile and for the most part do not appear to be thickened in any manner. Lip thickness tends to range between 7-9 mm. Temper tends to be coarse and is most frequently comprised of white grit, with lesser amounts of pink grit, black/white grit, and white/pink grit.

The seventh cluster consists of a total of 48 vessels (Vessels 1, 4, 7-8, 12-13, 16, 18, 20, 23, 27-28, 30, 32-35, 39-40, 42, 48-54, 56, 59-62, 64-65, 68-69, 72-75, 79-86) and is the largest cluster formed in the dendrogram. Vessels in this cluster have a total of 15 attributes in common. Those attributes which define the cluster include: absence of exterior and interior rim decoration; presence of rim thickening in the form of collaring; vertical surface treatment on the neck exterior; lack of interior and exterior neck decoration; vertically cordmarked exteriors; and plain/smooth interiors. Further, vessel lips tend to be undecorated and either smoothed over cordmarked or plain/smoothed and, in a minority of instances, have been cordmarked. Lips are most frequently flat in planview, although, in one case castellation is visible. Lips are mostly flat with minor occurrences of rounded and thickened varieties. Rims tend to be mostly vertical with smaller numbers of inverted and everted forms. Rim thickening occurs on all vessels in the form of collaring, with molded collars predominating and a lesser number of rolled/

folded collars. Vessels tend to be most frequently tempered with a mixture of black and white grit with lesser occurrences of white grit, mixed white and pink grit, and black grit, respectively. Temper size is predominantly coarse. Collar thickness ranges between 6-15 mm, lips between 4-9 mm, and rim height between 16-30 mm. Rim diameter typically falls between 16-30 cm.

The eighth cluster formed in stage one is comprised of seven vessels (Vessels 2, 6, 9, 14, 24, 25, 36). These vessels have 18 attributes in common. Those attributes which define Cluster Eight include: an absence of exterior and interior decoration on the rim and the lip region, a flat (i.e., uncastellated) lip, a vertical rim profile, the presence of rim thickening, and collar thicknesses between 11-15 mm. Further, these vessels lack interior and exterior neck decoration, and display either vertical or oblique cordmarking, fabric impression and plain/smooth exterior surface treatments. Lips tend to be cordmarked. Interiors in all instances are plain/smoothed. Lips are flat, with the single exception being rounded. Rim thickening occurs as either a rolled/folded collar or molded collar. Temper is predominantly coarse, with minor occurrences of medium size temper, and is composed primarily of a mixture of black and white grit. Minor occurrences of white grit and mixed white and pink grit also occur. Lip thickness is most frequently between 7-9 mm, rim height between 16-30 mm, and rim diameter between 16-30 cm.

Stages 2, 3 and 4

At Stage Two of the clustering procedure, at a distance of approximately 2.0, two new ceramic clusters are formed. The first cluster agglomerates Clusters Four and Five from stage one and combines them to form a single cluster. Cluster 1 consists of four vessels. These vessels have a total of eight attributes in common, all of which define the

cluster. This cluster is defined by the presence of exterior decoration on the neck and rim/collar area, vertical neck surface treatment, a castellated lip, rim thickening in the form of a molded collar, and temper comprised of a mix of black and white grit.

The second cluster formed during Stage Two consists of a total of 60 vessels and incorporates clusters six, seven and eight from Stage One of the procedure. These vessels have a total of eight attributes in common; however, only one is considered relevant in cluster definition. This cluster is defined by an absence of interior decoration on the rim/collar area.

At Stage Three, at a distance of approximately 4.0, a single cluster is formed. This cluster consists of nine decorated vessels from Clusters 1 and 2 from Stage One. These vessels have 13 attributes in common, nine of which are relevant in definition of this cluster including the presence of exterior decoration on the rim/collar area, an absence of decoration on the neck and interior areas of the vessel, vertical surface treatment on the neck, a vertical rim profile, and rim thickening in the form of a rolled/folded collar.

At Stage Four, at a distance of approximately 5.0, another cluster is formed. This cluster consists of nine vessels and incorporates Cluster 3 from Stage One with Cluster 1 from Stage Two. The defining characteristics of this cluster are the presence of exterior decoration on the neck area, vertical surface treatment on the neck, and the presence of rim thickening (i.e., collaring).

The next cluster formed occurs on the dendrogram at a distance of approximately 17.0. This cluster consists of 18 vessels and incorporates those clusters formed at Stage Three and Stage Four of the clustering procedure. The defining attributes of this cluster are vertical surface treatment on the neck and the presence of collaring. At this point, all vessels with exterior decoration have been incorporated into a single cluster.

At Stage Six, located at a distance of approximately 25.0, the cluster formed incorporates all 78 vessels used in the procedure. At this point on the distance scale, the

cluster is too large to be useful because all of the vessels have been agglomerated into a single group.

The cluster analysis performed here has identified internal variability and relationships within the Late Woodland ceramic assemblage from Dieffenderfer. It has revealed structure in the data by forming significant attribute clusters; these clusters essentially define the assemblage. These attribute clusters form the basis for type definitions and, ultimately, the framework for a classification of the assemblage. Classification involves both comparison with other assemblages in the region and interpretation of the material. While there is some degree of individual judgment and subjectivity by the researcher during the analysis of the material these comparisons are based on objective criteria.

The following discussion examines the differences and similarities between produced by the analysis and those specific ware and type categories known to have been produced in the Midwest Riverine-Great Lakes region during the Late Woodland period. In the majority of cases, however, the vessels in the Dieffenderfer assemblage could not be assigned to an existing ceramic ware or type simply because they do not resemble or fit into the range of established Late Woodland ware categories. The frequency with which this occurs in the assemblage is overwhelming, suggesting that a new ceramic ware is represented in the assemblage. For this reason, a new ware category is defined in which these "atypical" but distinctive vessels could be described. Vessels which could not be confidently assigned to a known or new ware category are described but not named. A discussion of those vessels assigned to earlier occupations at the site is presented first, followed by the Late Woodland material described in the cluster analysis. This is followed by a discussion of those vessels believed to be attributable to cultural influences derived from areas outside the St. Joseph valley, namely in the form of Mississippian contact or interaction to the southwest.

Middle Woodland Ceramics

Five vessels, accounting for 5.3% of the total assemblage, have been identified as Middle Woodland in origin based on the presence of diagnostic Middle Woodland characteristics. These Middle Woodland vessels were not included in the cluster procedure since they were clearly distinctive both temporally and stylistically from the Late Woodland material. All were classified according to established Middle Woodland ceramic types. Two Middle Woodland wares appear to be represented at the site, including Sumnerville ware and Hopewell ware. A brief description and discussion of each vessel follows.

Sumnerville Ware

Four of the Middle Woodland vessels in the assemblage display characteristics similar to Sumnerville ware. The first vessel (Vessel 21) is represented by a small upper rim fragment (Appendix B: Fig. 8A, Fig. 27A). The rim was recovered within the first level of Test Unit 35. It displays a plain, lightly smoothed interior and exterior surface. The lip area also appears lightly smoothed over. The paste is very fine in composition and somewhat silty in texture. The very few temper particles observed in the paste were classified as medium to slightly coarse in size. The rim profile is straight to slightly everted and the lip is rounded. The rim is thickened slightly in the form of a small, very subtle folded collar which has been insufficiently smoothed over on the exterior surface. Decoration is visible on the exterior in the form of a series of arching, horizontally-oriented rocker stamp impressions in the area joining the collar and the neck. The rocker stamping appears to have been applied in a side to side sweeping motion using a very fine edged, curved object, such as the side of a shell. The impressions are closely spaced together and create a “zig-zag” effect. The rocker stamping does not appear to be

bordered by a distinct line demarcating it from the undecorated portion of the vessel but a zoned motif is suggested by its placement. No additional form of decoration was observed on the rim.

Three body sherds with a similar decorative motif as that found on Vessel 21 were also identified in the assemblage. These body sherds do not appear to be from the same vessel based on their ceramic attributes and are probably representative of individual vessels. The first of these vessels, Vessel 94, is represented by two sherds. They were collected within the first and second levels of Test Unit 18, located roughly ten meters to the northwest of the unit where the rim fragment from Vessel 21 was recovered. Both sherds exhibit plain, relatively unmodified exterior surfaces. The paste is composed of a fine silty sand; temper is sparse and is composed of a fine grit. The rocker stamp impressions are finer and more lightly applied than Vessel 21, but the motif is very similar. The third Sumnerville vessel (Vessel 95) is represented by a single body sherd. This sherd is similar to Vessel 21 in terms of its paste and temper characteristics, its exterior surface treatment and its rocker stamped decorative motif. It has been tentatively assigned to a separate vessel given the fact that it was recovered approximately 20-25 meters northwest of Vessel 21 in the third level of Test Unit 122.

The fourth vessel in the assemblage assigned to the Sumnerville Ware category is Vessel 67. This vessel is represented by a small upper rim fragment (Appendix B: Fig.8B, Fig.27B). This rim sherd was recovered from the third level of Test Unit 104, less than five meters east of Vessel 21. It is characterized by a lightly smoothed exterior and a plain interior surface. The lip area has also been lightly smoothed over. Paste is generally fine to somewhat silty in texture. Temper consists of crushed rock of medium to coarse size and is of low density. The rim is straight-sided with no apparent signs of eversion. The lip is somewhat rounded and is distinctive for the presence of a rim fold on the interior of the rim. The rim exhibits no visible signs of decoration on the exterior,

interior or lip areas. Save for the absence of decoration, this rim is similar to Vessel 21 in terms of paste, temper, surface treatment, and overall form.

The presence of rocker stamping on three of these vessels suggests they are Middle Woodland in origin. Rocker stamping, in particular, is believed to be a diagnostic attribute of the Middle Woodland period in southern lower Michigan (Rogers 1971:72). These vessels have their closest affinity with Sumnerville ware, a Middle Woodland ceramic ware. Sumnerville ware has been defined as “all pottery in western Michigan that appears to be locally made, grit-tempered copies of classic Hopewell ware” (Kingsley 1990:216). Sumnerville ware is characterized by rims which are straight or cambered and display a diverse range of decorative modes and methods of application. Like their more classic Hopewell counterparts, crosshatched, rocker stamped and incised rim bands accompanied by a row of bordering punctates are common. In addition to this attribute, Sumnerville ware may be characterized by either zoned and/or non-zoned decorative motifs on vessel bodies. In the majority of cases, plain and dentate rocker stamping, as well as incising, are the predominant decorative techniques utilized on Sumnerville ware vessels. The range of decoration found on classic Hopewell ware from the Illinois valley is matched by Sumnerville ware; however, as Kingsley (1990:217) states, a more diverse range of variation characterizes the latter.

Sumnerville ware is a category Kingsley suggests encompasses locally made, grit tempered copies of classic Hopewell ware (Kingsley 1990). At present, it is an ill-defined ware category in need of further study and additional clarification based on its relationship with other Middle Woodland wares in the region. Sumnerville ware has close relationships with Green Point ware recovered from sites in the Saginaw valley where similar decorated and undecorated varieties have been reported (Fitting 1972). Most Green Point vessels tend to be crudely fashioned and decorated. The Dieffenderfer vessels differ from Green Point ware in that they appear to be better constructed and

decorated, suggesting they are more closely related to Sumnerville ware, which is distributed in western Michigan. Some affinity with “classic” Hopewell ware is also evident, most notably on the ceramic type “Hopewell Rocker variety Plain,” as defined by Griffin in the lower Illinois valley (Griffin 1952: Plate XXXV:L). These vessels differ from the classic imported Hopewell forms in that they lack the diagnostic features which define the ware, most notably the “classic” Hopewell rim, limestone temper, and very fine craftsmanship (Griffin 1952:118).

Kingsley introduced the Sumnerville ware concept based on Quimby’s (1941) original identification of Sumnerville Incised (referred to as Type II-C) at several Middle Woodland components in western Michigan, including the Sumnerville component in Cass County, the Scott component in St. Joseph County, the Norton and Converse components in Kent County, and the Brooks component in the Muskegon River valley. Sumnerville ware has also been identified in the lower Kalamazoo valley at the Hacklander site (Kingsley 1977:76-77, Plate 1:A) and the Armintrout-Blackman site (Spero et al. 1991:238, Figure 7:9), and in undated contexts in the Grand River valley at the Spoonville and Battle Point sites (Janet Brashler, personal communication). The temporal range for Sumnerville ware in western Michigan is suggested to be from A.D. 100-300, which encompasses the later part of the Middle Woodland Norton phase and the early Converse phase in western Michigan (Kingsely 1990:224). This range follows the introduction of classic Hopewell ware into western Michigan, believed to have occurred sometime between A.D. 100-200 (Griffin 1979), and the decline of Hopewellian influence at or around A.D. 300 (Griffin et al. 1970:1).

Hopewell Ware

One vessel in the assemblage is reminiscent of the ceramic type Brangenburg

Plain, a form of Hopewell ware. This vessel (Vessel 57) is represented by a small rim fragment (Appendix B: Fig. 8C, Fig. 27C). The sherd was recovered from the second level of Test Unit 92, in the same general vicinity as some of the Sumnerville vessels. The rim displays a smooth exterior and interior surface. The top of the lip has also been smoothed over. Paste is characterized by a silty, very fine light colored sand; no visible particles of crushed rock or tempering material were identified in its matrix. Decoration is visibly absent on the exterior, interior and lip areas, and no unusual wear patterns are indicated. The rim is relatively straight-sided and vertically oriented. The lip is unique in that it displays a thickened t-shaped lip profile. The lip is approximately 0.9 to 1.0 cm in width. The thickness of the neck tapers slightly below the lip to approximately 0.5 to 0.7 cm, and then it curves inward, suggesting it may be from a small bowl.

Brangenburg Plain was originally identified at the Brangenburg Mounds site in Calhoun County, Illinois (Baker et al. 1941) and was later defined by Griffin in the Illinois valley (1952:119). A diagnostic attribute of this type is a broad, flat T-shaped lip. Most vessels take the form of a small bowl although a minority of jar forms have been identified (Morgan 1985:202). Brangenburg Plain vessels are tempered most frequently with limestone although grog and grit tempered vessels are also known. The Dieffenderfer rim was tested for the presence of limestone using a dilute hydrochloric acid solution but the results of the analysis were negative. Decorated and undecorated vessels are variants of the type. Negative painted lips have been identified on Brangenburg vessels at several sites in Illinois, including the Clear Lake site in Mason and Tazewell Counties in the central Illinois valley and the Snyders Mound group in Calhoun County in the lower Illinois valley (Fowler 1952:171; Griffin 1952:119).

In addition to those sites mentioned previously, Brangenburg Plain vessels have a fairly wide distribution throughout the Illinois region. This type has been recovered at the Hubele Mounds and Village site in White County located in the lower Wabash valley

(Neumann and Fowler 1952:239), the Smiling Dan site in the lower Illinois valley (Morgan 1985:202) and the Holding site in the American Bottom (Maher 1989:45). Brangenburg Plain vessels have also been recovered at several Middle Woodland sites in the Ohio valley including the Rockhold Mound site, the Hopewell Mounds site, and the Mound City group (all in Ross County), the Fort Ancient Hilltop enclosure in Warren County, and the Turner site in Hamilton County (Prufer 1968). The occurrence of this ceramic type is unusual for southwestern Michigan and the St. Joseph valley. A similar lip form was identified on a vessel recovered from the Sumnerville Mounds site in Cass County, but this material displays more affinity with early Late Woodland material from the lower and central Illinois valley than it does with Brangenburg Plain (Garland 1990a:191).

Brangenburg Plain appears to have been most popular during the middle and late Hopewell period (Griffin 1952:115). Fowler (1952:171) suggests a similar temporal range at the Clear Lake site, which was occupied from the late middle through the late Hopewell period. At sites in the central and lower Wabash valley, Brangenburg vessels were recovered from sites associated with the Middle Woodland Allison culture, which is contemporaneous with the middle-late Hopewell period in the Illinois valley (Stephens 1974:50-51; Winters 1967). At the Holding site, radiocarbon dates suggest a temporal placement for the Middle Woodland occupations sometime between 50 B.C. and A.D. 250 (Maher 1989).

Late Woodland Ceramics

Seventy eight vessels have been classified as Late Woodland based on distinctive paste, temper and decorative ceramic attributes. These vessels account for approximately 82.1% of the total assemblage. All 78 vessels were used in the cluster analysis. Of these,

59 (or 75.6%) were assigned to a specific Late Woodland ware category. A total of 18 (or 30.5%) were assigned to a Late Woodland ware based on their affinity with material from southwestern Michigan (including Allegan ware, Moccasin Bluff ware, and Spring Creek ware). However, the majority of the Late Woodland vessels used in the analysis, 41 (or 69.5%), exhibit characteristics atypical of these wares and have been tentatively assigned to a new Late Woodland ware category. This new ware category is herein referred to as Dieffenderfer ware. The remainder of the Late Woodland vessels, 19 (or 24.4%), could not be confidently assigned to a specific ware category and have been classified as miscellaneous Late Woodland. A brief description and discussion of the material which was identified according to a specific Late Woodland category follows.

Dieffenderfer Ware

Dieffenderfer ware is represented by 41 vessels and accounts for 69.5% of all Late Woodland material in the assemblage. There appear to be two accompanying types represented in the assemblage. The first type is defined as “Dieffenderfer Decorated.” This type is represented by 13 vessels and accounts for 31.7% of those vessels identified as Dieffenderfer ware. There appear to be four variants which define this type. These variants exhibit decoration on the exterior rim/collar area, the neck and the lip and have been defined on the basis of the dominant decorative technique employed: these include variant corded tool impressed, variant corded tool punctate, variant push-pull (or jab-drag), and variant incised.

Dieffenderfer Decorated, variant Corded Tool Impressed. This decorated variant is represented by seven vessels (Vessels 3, 22, 43, 58, 66, 70, and 71). These vessels were grouped with Clusters 1, 2 and 4 in stage one of the clustering procedure and are represented almost exclusively by rim sherds (Appendix B: Fig. 9A-G, Fig. 28A-G)

recovered from various areas of the site, including test units and features in the immediate vicinity of the 1993 and 1995 housefloor areas (Zones A and B, respectively) and in Feature 13 (Test Unit 100) in Zone C.

This variant is characterized by vessels with exterior decoration on the rim/collar area and, in some cases, neck (n=3) and lip (n=4) decoration. Decoration occurs most frequently on the exterior collar as a single row of oblique cordwrapped tool impressions (n=5) or, as represented on two vessels, a double row of opposed obliques in the form of a right-pointing chevron motif. Neck decoration, when it occurs, takes the form of either a single row of oblique corded tool punctates (n=1) or corded tool impressions (n=1) immediately below the collar or, in one case, a series of oblique, parallel trailed lines. Lip decoration occurs on four vessels and is produced either by a corded tool (n=3) or a cordwrapped cord (n=1). When the lip is impressed with a corded tool the impressions are placed either in an oblique fashion (n=2) or, less frequently, perpendicular (n=1) to the lip. Cordwrapped cord impressions are placed parallel to the exterior and interior lip margins so that they encircle the rim. In all cases, save one, interior decoration is absent. The exception displays a single row of corded tool impressions on the interior neck area of the vessel.

The exterior rim and neck area is most frequently cordmarked or smoothed cordmarked, with one example of a plain rim. Lips are either cordmarked or plain with one vessel exhibiting a smoothed over cordmarked lip. Lips are predominately flat (n=5) with minor occurrences of rounded (n=2) forms occurring. Additionally, they may be either castellated (n=4) or flat (n=3) in planview. When castellated, lips display either low, rounded castellations (n=2) or more pronounced, peaked rims (n=2). Lips are generally 4-6 mm thick (n=4), with a minority of forms somewhat larger. Rims are vertical and thickened by some form of collaring, including examples with rolled/folded collars (n=4) and molded "true" collars (n=3). Collar thickness ranges from 6-10 mm

(n=2) to 11-15 mm (n=2) to those over 15 mm with more massive collars (n=3). Rim height ranges from 16-30 mm, with smaller and larger forms occurring, and rim diameter estimates most frequently fall between 16-30 cm when measurable. Temper is generally coarse (n=6) and is comprised of a mixture of black and white coarse grit (n=6); one vessel exhibits the use of coarse pink grit tempering.

Dieffenderfer Decorated, variant Corded Tool Punctate. This decorated variant is represented by three vessels (Vessels 45, 76, and 89). These vessels were grouped with Cluster 2 in Stage One of the clustering routine. They are represented by rim sherds collected from two main areas at the site (Appendix B: Fig. 10A-C, Fig. 29A-C), including the 1993 housefloor area in Zone A and Feature 17 (Test Unit 111) in Zone C. This variant features exterior decoration on the rim/collar area and the top of the lip. Decoration occurs on the rim in the form of a single row of vertically oriented corded tool punctates. The lip has been treated in a similar fashion with the punctates running parallel to the lip margins. Decoration is absent on the interior. The exterior rim and neck area is either plain (n=1), vertically cordmarked (n=1) or smoothed over cordmarked (n=1). The lip is plain, flat, exhibits low, pointed castellations and, most frequently, ranges between 7-9 mm in thickness (n=2), with one example just over 9 mm thick. Rims are vertical in profile and thickened by a rolled/folded collar. Collars generally are between 11-15 mm thick with one vessel over 15 mm. Rim height is between 16-30 mm and rim diameter, when measurable, falls most frequently between 16-30 cm. Temper is consistently coarse and is composed most often of white grit (n=2), with one example displaying a mixture of black and white grit.

Dieffenderfer Decorated, variant Push-Pull. This decorated variant is represented by two vessels (Vessels 44 and 88) grouped with Cluster 1 in Stage One of the clustering procedure. These vessels are represented exclusively by rim sherds collected from the 1993 housefloor area (Appendix B: Fig. 11A-B, Fig. 30A-B). The variant is

characterized by vessels with exterior decoration confined to the rim/collar area. Decoration occurs on the rim as an oblique row of push-pull impressions created with a sharp, pointed object. Exterior rim surfaces are plain, and the neck appears to be lightly cordmarked in a vertical fashion. Lips are plain, flat and are suggestive of low, pointed castellations. Lip thickness ranges between 4-6 mm. Rims are vertically oriented and thickened by a rolled/folded collar. Collar thickness ranges between 6-10 mm, and rims are under 15 mm in height. Temper is fine and is composed of a mixture of black and white grit.

Dieffenderfer Decorated, variant Incised. This decorated variant is represented in the assemblage by the one vessel (Vessel 63) comprising Cluster 5 in Stage One of the clustering routine. It is represented by rim sherds and body sherds collected from Feature 10 (Test Unit 100) located in Zone C (Appendix B: Fig. 12A, Fig. 31A). This vessel is characterized by exterior decoration on the rim/collar, neck and shoulder area, the lip, and the interior rim and neck region. Decoration occurs on the exterior portion of the rim as a single horizontal row of circular, punctate-like impressions at the base of the collar, created with the tip of a hollowed object (possibly a reed). On the neck and shoulder area, the vessel has been incised using a sharp, pointed object, creating a very unique and complex zoned motif. This motif consists of incised triangles and rectangles filled with combinations of parallel and oblique lines. Lip decoration occurs as crosshatched incising possibly created with the same tool. The interior rim and neck has been similarly treated with crosshatching and occurs as an extension of the lip decoration. The exterior rim and neck region has been treated with a cordwrapped paddle and then subsequently lightly smoothed over in areas. The lip has been lightly smoothed prior to decoration and is flat. The lip area displays low, pointed castellations. Lip thickness is between 4-6 mm. The rim is everted in profile and is thickened with a molded collar. Rim height ranges between 16-30 mm. Rim diameter was difficult to assess, but appears to range between

16-30 cm. Temper is composed of a mixture of black and white coarse grit.

The second type of Dieffenderfer ware is defined as “Dieffenderfer Undecorated.” This type is represented by 28 vessels and accounts for 68.3% of those vessels identified as Dieffenderfer ware. This type also appears to be represented by four variants. These variants lack decoration and have been defined primarily by the type of surface treatment used on the exterior of the vessel. These variants include: variant smoothed over cordmarked, variant cordmarked, variant fabric impressed and variant plain.

Dieffenderfer Undecorated, variant Smoothed Over Cordmarked. This undecorated variant is represented in the assemblage by 13 vessels (Vessels 4, 33, 36, 39, 53, 61, 65, 68-69, 73, 75, 79-80). These were grouped with Clusters 7 and 8 in Stage One and are represented by rim sherds and body sherds recovered from test units and features in Zones A, B and C (Appendix B, Fig. 13A-E, Fig. 14A-H, Fig. 32A-E, Fig. 33A-H). This variant is characterized by vessels which lack decoration on the exterior and interior rim/collar area and the top of the lip, and in most instances, appear to lack decoration below the collar on the neck. Vessel exteriors exhibit predominantly vertical smoothed over cordmarking on the rim and neck area. In some cases, the cordmarked impressions are nearly obliterated due to intensive smoothing of area. Lips are plain/smoothed (n=7) or smoothed over cordmarked (n=6). Lips are mostly flat (n=11), with a minority of rounded (n=2) forms. In all instances, lips are uncastellated. Lip thickness most frequently ranges between 4-6 mm (n=10), with the lips on three vessels falling between 7-9 mm. Rims are vertical and thickened by a rolled/folded collar (n=4) or, most frequently, a molded collar (n=9). Collars are typically between 11-15 mm thick (n=10), with one between 6-10 mm and two over 15 mm. Rim height is predominantly between 16-30 mm (n=10). Temper is usually coarse (n=9) and is composed of a mixture of black and white grit (n=5), mixed white and pink grit (n=3), white grit (n=3), and black grit (n=2).

Dieffenderfer Undecorated, variant Cordmarked. This undecorated variant is

represented by 11 vessels in the assemblage (Vessels 8, 23, 32, 52, 59, 72, 81-82, 84-86) originally grouped with Cluster 7 in Stage One during the cluster analysis. They are represented by rim sherds collected from test units in Zones A, B and C (Appendix B, Fig. 15A-K, Fig. 34A-K). This variant is characterized by vessels which lack exterior and interior rim decoration and, in most instances, appear to lack neck and lip decoration. Vessels exhibit either vertical cordmarked (n=9) or oblique cordmarked (n=2) exterior rim/collars and vertically cordmarked necks. Interiors are plain/smoothed. Lips are most frequently plain/smoothed (n=6), with minor occurrences of smoothed over cordmarked (n=3) and cordmarked (n=2) treatments. Lips are predominantly flat (n=10), with one rounded lip present. Lips are between 4-6 mm thick (n=7) on most examples. Rims are mostly vertical (n=7), although some slightly inverted forms (n=4) also occur. Rims are thickened and collared, occurring as either a rolled/folded collar (n=6) or a molded collar (n=5). Collars most frequently range between 11-15 mm in thickness (n=8), with smaller forms ranging between 6-10 mm (n=3). Rim diameter, in most instances, was not measurable; those that were ranged between 16-30 cm in diameter. Temper is mostly coarse (n=7), with medium size particles also occurring (n=4). Temper consists of either white grit (n=6) or a mixture of black and white grit (n=5).

Dieffenderfer Undecorated, variant Fabric Impressed. This undecorated variant is represented by three vessels (Vessels 2, 14, and 24). These were grouped in Cluster 8 of Stage One. They are represented by rim sherds collected from test units and features in Zones A and B (Appendix B: Fig. 16A-C, Fig. 35A-C). This variant is characterized by vessels which lack exterior and interior decoration on the rim and neck areas and the top of the lip. They most frequently exhibit fabric impressed rims and necks (n=2), although one example with an oblique cordmarked rim and fabric impressed neck was identified. In all instances, lips appear to have been cordmarked. Lips are flat, uncastellated and most frequently are 7-9 mm thick. One example with a slightly thicker

lip (over 9 mm) was measured. Rims are vertical, and rim thickening occurs as either a molded collar (n=2) or a rolled/folded collar (n=1). Collar thickness, in all cases, ranges between 11-15 mm. Rim height is over 30 mm in two instances and between 16-30 mm in the third example. Temper is coarse and is composed predominantly of a mixture of black and white grit, although one vessel with a mixture of white and pink grit was observed.

Dieffenderfer Undecorated, variant Plain. This undecorated variant is represented in the assemblage by one vessel (Vessel 25). It was grouped with Cluster 8 in Stage One of the clustering procedure. Rim fragments from this vessel were collected from test units in Zone B near the 1995 housefloor (Appendix B: Fig.17A, Fig.36A). This variant is characterized by a lack of exterior and interior decoration on the rim and neck region as well as the top of the lip. Both the rim and neck region have been left plain and unmodified. The lip area has been similarly treated. The lip is flat, uncastellated, and is approximately 7-9 mm thick. The rim is vertical and is thickened by a rolled/folded collar. Collar thickness ranges between 11-15 mm. The rim is slightly over 30 mm in height and rim diameter suggests a vessel orifice between 16-30 cm. Temper is coarse and consists of a mixture of black and white grit.

The exact cultural relationships of Dieffenderfer ware is unknown. This material is unlike ceramics produced in southwest Michigan during the Late Woodland period. This is especially apparent in collaring. Collars on Allegan and Spring ware are not like collars on Dieffenderfer ware. Rather, they have smooth junctures with the vessel neck while Dieffenderfer collar-neck junctures are abrupt and sharply angled. The stylistic attributes exhibited by these vessels appear to be more closely related to Iroquoian ceramic developments in the Straits of Mackinac area, southeast Michigan, and southern Ontario. Also, there also may be some form of cultural ties with groups in central Indiana.

Material attributable to the Oliver Phase in central Indiana shares a number of

close, yet distinctly unique, stylistic similarities with the Dieffenderfer material. This phase is documented by material recovered from sites in Marion County (Bowen, Oliver, Jose, Bosson, Haueisen) and Hamilton County (Strawtown, Conner Trading Post), located immediately north of Indianapolis (Dorwin 1971; Griffin 1966). The type Bowen Collared, defined at the Bowen site, exhibits attributes found on the Dieffenderfer ware vessels (Dorwin 1971:267-268; Plates 24-28). This type is described as a grit tempered, cordmarked form. Collars are present and decoration is limited to the collar and the lip. When applied to the collar, decoration takes the form of 3 or 4 parallel horizontal rows circling the rim produced by corded tool impressions or by the "punch and drag" technique (i.e., push-pull). Horizontal rows of circular punctates and knotted-cord impressions may also be applied to the collar area. Less frequently, rows of corded tool impressions, applied in a chevron-like motif, are present. Lips are generally flat and are decorated with transverse cord impressions, channeled cord impressions or channeled punch and drag punctations. Vessel bodies typically are elongate-globular shaped with rounded bases (Dorwin 1971:268). Kellar (1973:54) suggests the material from Bowen is evidence of some form of interaction with groups to the north.

A vessel from the Strawtown site, located north of Bowen in Hamilton County, is also very similar to the Dieffenderfer material, particularly Vessels 22 and 70 (Griffin 1966:Plate CLVII: Figure 4). This vessel exhibits corded tool impressions in an oblique, opposed motif which form a right-pointing chevron motif like that found on the Dieffenderfer pot. Other material identified in the area also appears to be closely related to the vessel recovered from the Strawtown site (Griffin 1966: Plate CLVI: Figure 1-24). Griffin attributes this material to Late Woodland groups residing in northcentral Indiana who were possibly related to the Iroquois in Ontario (Griffin 1966:266).

A relationship also can be seen to material associated with Western Basin Tradition (formerly Younge) Springwells Phase (ca. A.D. 1200-1400) groups in the

western Lake Erie region, including areas both in southeast Michigan and northwest Ohio (Stothers 1975, 1978; Stothers and Graves 1983; Stothers and Pratt 1981) and southwest Ontario (Murphy and Ferris 1990). Some of the Macomb Linear material that has been referred to as “Western Basin Ware” by Stothers and Pratt (1981:93) is comparable with Fitting’s (1965) Riviere ware category and has some general similarity to Dieffenderfer ware. Springwells Phase vessels are believed to be closely related to ceramic developments occurring in the Uren-Middleport Phases of the Ontario Iroquoian tradition (see Dodd et al. 1990:321-359; Murphy and Ferris 1990:209).

Springwells Phase vessels typically are predominantly cordmarked or smoothed over cordmarked, display straight (sometimes outflaring), weak to well-developed rims and collars, exhibit large castellations, and flattened lips (Stothers and Pratt 1981:96). Collars are decorated in one of two ways. Most frequently, on the collar and/or directly below one or more bands of horizontal motifs are present; a band or bands of oblique stamped impressions and combinations of the above may also occur. In most examples, these decorative motifs are confined to the collar although neck decoration in the form of obliques, triangles or plaits created by stamping or incising may occur. Collar decoration may also be implemented by cord-roughening, fabric or net impressions. Decoration occurs on the lip as a series of punctations or transverse stamped impressions. Interiors generally are not decorated. During Springwells, push-pull (drag-jab) increases as does incising and trailing; dentate stamping is popular during this time and cord impressing, tool impressing and punctating may also be used (Stothers and Pratt 1981:97). A point of departure from the Dieffenderfer material is that Springwells Phase vessels display extremely longate and bag-shaped vessel forms; Dieffenderfer ware vessels exhibit slightly constricted necks and globular-shaped (i.e. rounded) bodies more consistent with western Michigan Late Woodland pottery in general (Stothers and Pratt 1981:96, Figure 5).

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This material shares no affinity with Sandusky Tradition (see Stothers and Graves 1993) and Whittlesey Tradition groups (see Brose 1994) in the lower Lake Eries basin area. These traditions demonstrate closer ceramic ties to Mississippian Ft. Ancient peoples to the south in the Ohio valley during the Late Woodland period in southern Michigan (Rutter 1984:220; Stothers and Pratt 1981:14).

The distinctive attributes of Dieffenderfer ware compared to other known types suggest some form of Iroquoian contact or influence at the site. While no direct analogs exists, the closest cultural relationship for this material appears to be with groups related to the Huron. The term "Huron" has been used most recently to designate not only historic and late prehistoric archaeological sites in Huronia, itself, but also a large number of prehistoric and protohistoric sites distributed throughout southcentral Ontario dating between A.D. 1400-1600 (Ramsden 1990:361). Huron ceramics are described as being of typical Iroquoian form, exhibiting rounded, globular bodies, slightly constricted necks and slightly flared, collared rims. Exteriors are most frequently well-smoothed, with minor occurrences of cordmarking. Collars are generally short (10-30 mm), with higher collars occurring, and are sharply demarcated from the neck. Decoration is present on Huron vessels in distinct zones. It may occur on the interior rim area, the lip, the exterior collar region, the neck, the shoulder or the body. Those decorative techniques most frequently used include incising, trailing, stamping, or punctation. Other techniques which occur, albeit less frequently, include corded-tool impression, dentate stamping, push-pull, modeling (or applique) and painting (Ramsden 1990:365).

The collar, neck, and shoulder areas on Huron vessels appear to be the most popular areas for vessel decoration (Ramsden 1990:365-366). Collar decoration generally occurs as straight line motifs comprised of a combination of vertical, oblique and horizontal lines. Secondary decoration may be applied by gashes or punctates at the top or bottom of the collar or between decorative panels.

Some collar decorative motifs may vary chronologically and spatially. Opposed and horizontal motifs are considered diagnostic of the early part of the Huron sequence, with verticals and obliques more popular later in the sequence. Neck decoration also may be equally sensitive to space and time considerations, with decorated necks most popular early in the sequence and undecorated necks later. Interior rim decoration, when it occurs, is more common earlier rather than later in the sequence. Lip decoration usually consists of transverse or oblique incised lines; punctates may also occur (Ramsden 1990:368).

In general, lip decoration tends to increase through time. Castellations are also spatially and temporally sensitive. Those “early” Huron vessels typically display castellations with simple pointed or rounded forms, characterized by simple peaks along the collar region; “later” Huron vessels tend to be considerably more elaborate in style, projecting outward and overhanging the neck. Huron forms may have one castellation or appear as multiple projections along the rim (Ramsden 1990:368).

Ceramic material attributable to Huron influence has been found at sites located throughout northern and southern Michigan. Material from the Beyer site, located near St. Ignace in Mackinac County, Michigan, is notable for its close similarities to some of the decorated Dieffenderfer ware vessels (Fitting and Clarke 1974). A vessel from this site is decorated with a band of right pointing horizontal chevron tool impressions on the rim, exhibits a plain surface, a square/squat collar, and a square (i.e., flat) lip. It also appears to display low, rounded castellations on the upper rim area. The decorative motif expressed on this vessel is very similar to that displayed on the exterior rim area of Vessels 22 and 70. It is perhaps significant that a similar decorative motif has been identified on material from the nearby Juntunen site, located on Bois Blanc Island in the Straits of Mackinac (McPherron 1967: Figure 11). At the Hacklander site, located in the lower Kalamazoo valley, a vessel with a similar rim theme has been identified (Kingsley 1977: 92, 142, Plate 25a). This vessel is unclassified and exhibits a folded rim, corded-tool

impressions on the lip and castellations (attributes found in combination on the Dieffenderfer vessels); a notable distinction between this vessel and those recovered at Dieffenderfer is that the Hacklander vessel displays a thin, weakly pronounced collar.

Another vessel from Beyer exhibits a single row of oblique corded-tool impressions on the exterior rim/collar area and on top of the lip (Fitting and Clarke 1974:243, Figure 36:L). This vessel lacks a collar and appears uncastellated, but the decorative motif expressed on the exterior rim and lip areas is not unlike those found on Vessels 66 and 71. In the lower Kalamazoo valley, a similar decorative motif was identified on a vessel from the DeBoer site (Kingsley and Garland 1980: Plate 7). This vessel is similar to the Dieffenderfer pots in that it is collared and displays a horizontal row of oblique impressions on the exterior rim and lip areas. A relationship is also suggested based on the occurrence of similar material from Hacklander (Kingsley 1977: Plate 26c-f). Similar material was also identified at the Whorley Earthwork site (20BR6), located on the edge of a bluff overlooking Gilead Lake in Branch County (Speth 1966: Plate II:C3-5), immediately east of the Dieffenderfer site. Three of the vessels from Whorley exhibits corded tool obliques on the exterior collar and rim area with one displaying similar treatment on the lip.

A vessel with vertical corded-tool impressions on the exterior collar area (as opposed to a row of obliques) was also identified at Beyer. This vessel is similar to those previously described for Beyer in that it exhibits a plain exterior, a distinctive square/squat collar, and a square lip. It also exhibits castellations. The interior lip area has been notched, and the area immediately below the collar displays a row of punctates created with the end of a stick. The impressions on the exterior collar region have been produced with a corded-tool. This vessel shares affinity, in a number of different ways, with material from Dieffenderfer, most notably vessels 3, 43 and 58. The main difference between the Beyer vessel (and the others at this site) is the presence of cord wrapped-cord

impressions on the lip area of one of the Dieffenderfer vessels. This decorative treatment has been identified on material from sites in the Straits area (i.e., Juntunen), the lower Kalamazoo valley, and in southeastern Michigan on the Riviere ware type Macomb Linear-Corded (Fitting 1965: Plates XIV-XV).

The use of corded-tool punctates on the exterior collar (and lip) of three of the Dieffenderfer pots (Vessels 45, 76, 89) and the two vessels with oblique impressions suggestive of a push-pull method (Vessels 44, 88) appear to be closely related to these same vessels in terms of the decorative motif used on the rim area; the primary difference is that a different decorative technique was probably utilized in its application.

The incised decorated variant represented at Dieffenderfer (Vessel 63) is the most interesting vessel in the assemblage. Although no exact correlate could be found during a review of the literature, this vessel appears to be most closely related to material from sites located in southern Ontario attributable to Iroquoian, most notably the Huron. The single, horizontal row of punctates, located at the base of the collar, is a decorative motif typically found on Huron and related Iroquoian vessels in southern Ontario (Ramsden 1990:366). The use of elaborate neck decoration exhibited on this vessel is also evidence of some Iroquoian ceramic influence. Complex, incised neck motifs, consisting of combinations of triangles and others shapes, frequently occur on Iroquoian pottery. The most notable is Black Necked, an early Huron ceramic type (MacNeish 1952:36).

The undecorated Dieffenderfer ware material is equally interesting. While lacking any diagnostic evidence of decoration attributable to a particular type, the smoothed over cordmarked, cordmarked and plain variants are very similar in vessel rim form (i.e., profile) to Iroquoian pottery from southern Ontario, as illustrated by MacNeish (1952: Figure 24). These vessels appear to be most closely related in form to material associated with the Huron. Other cultural relationships are also evident. The three fabric impressed vessels from Dieffenderfer are similar in surface treatment, collaring and rim

form to a vessel from Kline I attributable to the Riviere ware type “Springwells Net Impressed” (Quattrin (1988:62-63). This type was originally defined by Fitting (1965) in southeastern Michigan as a product of the Younge tradition; it was most popular during the Springwells phase (ca. A.D. 1200-1400) in this region.

The idea of Iroquoian influence in the Straits area was suggested by McPherron (1967) in his interpretation of the ceramics from Juntunen. He suggested that during the Juntunen phase (ca. A.D. 1200-1400) influence from southwestern Ontario increased dramatically in the form of Iroquoian-style pottery development. He noted the adaptation of Iroquoian pottery traits during this period such as developed collars, castellations, and rounded bottoms, as well as the use of linear punctation and drag-and-jab/push-pull (both applied in horizontal bands on collars), interior rim decoration and lip decoration. Decoration below the collar occurs less frequently. Fitting and Clarke (1974) classified the material previously described from Beyer as “Huron-like” based on its similarities to ceramics from late prehistoric and early historic (i.e., contact) period sites in Ontario (Fitting and Clarke 1974:22). They suggest these vessels are “intrusive” and represent “local re-interpretation of Huron design elements” (Fitting and Clarke 1974:242). Their argument is based on the fact that this material could not be attributed to a specific Huron ceramic type, as defined by MacNeish (1952) and Wright (1966); nonetheless, they suggest a relationship exists based on a similar constellation of decorative attributes on these pots.

Kingsley (1977:92) suggests the material from the Hacklander site with general affinities to Dieffenderfer ware is representative of some form of contact with, or influence from, Lake Forest peoples in the Straits area or Iroquoian groups to the east. A similar situation is inferred at DeBoer. The collared, corded-tool impressed DeBoer pot (like other material at the site) is described as being very atypical of collared Allegan ware in the region. Kingsley and Garland suggest the DeBoer vessel is more like Lake Forest

material in the Straits area in terms of its exterior rim and lip decoration and collaring (Kingsley and Garland 1980: 12). They attribute the occurrence of this pottery at DeBoer to “some form of interaction between Allegan tradition peoples and groups located to the north” sometime during the Late Allegan phase (ca. A.D. 1000-1350) in the lower Kalamazoo valley (Kingsley and Garland 1980:16).

Allegan Ware

Five of the Late Woodland vessels used in the cluster analysis are representative of Allegan Ware, a locally-produced Late Woodland ware commonly found in southwestern Michigan (Rogers 1972). These vessels were grouped with Clusters 6 and 7 in Stage One. Allegan ware accounts for approximately 8.5% of all Late Woodland ceramics at the site. These vessels are similar to the Allegan ware type Allegan Undecorated. Two variants of this type are represented: Undecorated Lip and Undecorated Lip/Collared.

Allegan Undecorated, variant Undecorated Lip. This type is represented by two vessels. The first, Vessel 78, consists of a single rim sherd fragment recovered in the first level of Test Unit 116, located in Zone B of the site (Appendix B: Fig.18A, Fig.37A). The second vessel, Vessel 90, consists of a small rim sherd recovered during excavations at the site by Mr. Jones in Zone A (Appendix B: Fig.18B, Fig.37B). Both of these vessels are very similar in terms of their ceramic attributes. Both are tempered with a coarse grit, exhibit a vertical rim profile, are relatively thin and lack evidence of rim thickening and castellations, exhibit no evidence of decoration on the exterior, interior and lip areas, and are characterized by a flat lip. The primary difference between these vessels is surface treatment and temper. Vessel 78 displays a smoothed over cordmarked lip, a vertical smoothed over cordmarked exterior and pink colored grit temper. Vessel 90 is

characterized by a cordmarked lip, an oblique cordmarked exterior and a mixture of white and pink colored coarse grit temper.

Allegan Undecorated, variant Undecorated Lip/Collared. This type is represented at the site by three vessels. The first vessel, Vessel 49, is represented by two rim sherds and two body sherds recovered from Feature 4-B located in Test Unit 53 (Appendix B: Fig. 18C, Fig.37C). This vessel is characterized by a vertically cordmarked exterior and plain/smooth interior. The lip has been similarly treated with a cordwrapped paddle. No signs of decoration are visible on the vessel. The lip is thin, flat in profile, and uncastellated. In profile, the rim is vertically oriented, thickened slightly by a very subtle molded collar, and is noticeably flared in profile at the shoulder. Temper is a mixture of medium sized black and white grit.

The second vessel, Vessel 64, is represented by 16 rim and six attached body sherds (Appendix B: Fig.18E, Fig.37E). The sherds were recovered from Feature 10 (Test Unit 100) and level two of Test Unit 122, both located in Zone C. The exterior is characterized by a very coarse, vertically cordmarked rim and neck area. The interior of the vessel is plain and unmodified. The lip displays similar treatment as that applied on the exterior. The vessel displays no evidence of decoration on the exterior, interior or lip areas. The rim is vertically oriented and is thickened by a small molded collar. In profile, the lip is thin, flat and uncastellated. Temper consists of a coarse white grit.

The third vessel, Vessel 42, consists of 25 rim sherd fragments collected from Features 4-A and 4-B in Test Unit 53 (Appendix B: Fig. 18D, Fig.37D). The exterior of the vessel is vertically cordmarked. The interior is plain. The lip has also been treated with a cordwrapped paddle. The vessel exhibits no evidence of decoration on the exterior, interior or lip region. The rim is vertical and thickening occurs in the form of a good collar. The lip is flat and displays no signs of being castellated. Temper is comprised of a coarse white grit.

Allegan ware is described as a coarsely grit tempered ceramic ware typified by vessels with vertically and obliquely cordmarked exteriors, smoothed interiors, and an absence of decoration. Lips are frequently cordmarked, undecorated, mostly flat in cross section, lack castellation and rim thickening in the form of collaring, and exhibit straight, vertically-oriented rims (Brashler 1981:329, 353). The type Allegan Undecorated was proposed by Brashler (1981) in her regional analysis of early Late Woodland ceramics in southern lower Michigan. Brashler derived this type from three sources: Roger's (1971, 1972) original definition of Allegan Ware from material collected at the Fennville and 46th Street sites in the lower Kalamazoo valley (defined as "Allegan Cordmarked"); similar material from the Moccasin Bluff site, defined by Bettarel and Smith (1973) as "Moccasin Bluff Cordmarked;" and material from the Hacklander site in the lower Kalamazoo, defined as "Allegan Undecorated Cordmarked" (Kingsley 1977).

Allegan ware is a product of Allegan tradition people, as defined by Kingsley (1977). The geographical distribution of Allegan ware at that time was primarily confined to the Kalamazoo River valley, although it now appears to have extended as far south as the St. Joseph valley. Allegan ware and its counterpart in the St. Joseph valley, Moccasin Bluff ware, appear to share a number of close similarities. The nature of the relationship between these two wares remains to be explained (Brashler 1981:353). Allegan ware also demonstrates some affinity with Spring Creek ware (and the Spring Creek tradition) in the Grand and Muskegon drainages to the north and lesser ties to Wayne Ware, concentrated in eastern Michigan. The relationship of Allegan Ware to early Late Woodland ceramics in Illinois and Wisconsin is suggested but very poorly understood. Brashler (1981:353) suggests Allegan ware has a long temporal history in southern lower Michigan, beginning around A.D. 500 and terminating at the end of the 13th century.

Moccasin Bluff Ware

Twelve Late Woodland vessels exhibit characteristics similar to Moccasin Bluff ware. This ware accounts for 20.3% of the classified Late Woodland material at the site. Moccasin Bluff ware is represented in the assemblage by two types. These types are Moccasin Bluff Collared and Moccasin Bluff Impressed Exterior Lip.

Moccasin Bluff Impressed Exterior Lip. This type is represented at the site by one vessel (Vessel 46). This vessel is represented by an upper rim sherd and seven body sherd fragments (Appendix B: Fig. 19F, Fig. 38F). Both the rim and body sherds were recovered from Feature 4 (Test Unit 53). Temper is composed of a white, medium size grit. The rim exhibits a smoothed over cordmarked exterior and a smoothed interior; the body sherds are characterized by a cordmarked exterior and smoothed interior. Decoration is visible on the exterior of the rim in the form of a series of half inch vertical, parallel impressions beginning at the exterior edge of the lip. The impressions appear to have been applied using the edge of a circular-shaped tool. No other form of decoration was present on the rim or the body sherds from this vessel. The lip is uncastellated, rounded in profile and displays a plain, unmodified surface. The rim is vertically oriented and exhibits no signs of thickening, such as collaring.

The type Moccasin Bluff Impressed Exterior Lip was originally identified and defined from material at the Moccasin Bluff site (Bettarel and Smith 1973:61, Plates 22-25). This type is most popular during the Moccasin Bluff Phase (ca. A.D. 1050 and A.D.1200) at the site (in conjunction with shell tempered, cordmarked Fisher-like material from northeastern Illinois and northwestern Indiana) and is considered a diagnostic type of the phase. This type is most closely affiliated with Upper Mississippian Fisher material and shares a more distant relationship with Langford and Oneota-related Huber material in the same region (Bettarel and Smith 1973:114-115). The exterior lip

decoration found on this type is possibly the result of influence and/or contact with Mississippian-related groups during this period.

The type Moccasin Bluff Impressed Exterior Lip has been recovered at sites throughout southwestern Michigan. At the Kline I site, located in the Middle St. Joseph valley, a rim sherd similar to this type has been identified in the ceramic assemblage (Quattrin 1988:67). Most of the ceramic material recovered from Kline I has been attributed to the early thirteenth century, based on radiocarbon dates from features at the site. Similar material has also been recovered at the Schwerdt site, a Berrien Phase (ca. A.D. 1400-1600) occupation located on the lower Kalamazoo River in Allegan County, Michigan (McAllister 1980:39-43, Plates 2-5). Schwerdt supports the persistence of this ceramic type in the region into late prehistory.

Moccasin Bluff Collared. This type is represented at the site by eleven vessels; there appear to be two variants in the assemblage. The first variant, consisting of five vessels, displays exterior decoration on the neck region (Appendix B: Fig.19A-E, Fig.38A-E). Rim fragments from these vessels were recovered in test units in the vicinity of the 1993 housefloor area, save for one vessel recovered in Test Unit 91, located in Zone B. These vessels (Vessels 10, 11, 38, 55, 87), all display vertically cordmarked or smoothed over cordmarked exteriors, plain/smoothed interiors, either a cordmarked, smoothed over cordmarked or plain lip, predominantly flat lips (although one vessel with a slightly thickened lip was observed), vertical rim profiles, an absence of castellation, and rim collaring in the form of either a folded collar or a molded true collar. Decoration is present on five of the vessels on the exterior neck area immediately below the collar in the form of horizontal trailing created by a pointed tool. In one case, the trailed motif is accompanied by what appears to be a horizontal row of punctate-like impressions immediately above. Lip and interior decoration are noticeably absent from these vessels. The second Moccasin Bluff Collared variant, consisting of six vessels (Vessels 1, 9, 12,

35, 48, 51), are undecorated (Appendix B: Fig.20A-F, Fig.39A-F). Rim sherds from five of these vessels were also recovered in the general vicinity of the 1993 housefloor. The single exception is the vessel collected from Test Unit 67 in Zone B. These vessels are nearly identical to those previously described, save for the absence of decoration on the neck area.

Moccasin Bluff Collared is presently poorly defined in southwestern Michigan. Bettarel and Smith describe the collared material from Moccasin Bluff as part of a series of ceramic developments occurring in the region, beginning sometime around A.D. 1000, with a movement from “weakly developed, small collars and thinner vessel walls to thicker and more massive collars” (Bettarel and Smith 1973:113-114). They identify two groups of collared Moccasin Bluff ware. The first group (Group A) they associate with earlier developments at the site, noting similarities between this material and vessels from the Brems site in northwestern Indiana and the Spring Creek site in Muskegon County, Michigan. The second group (Group B) they associate with later ceramic trends occurring throughout the Midwest, identifying similarities between this material and such types as Aztalan Collared from Wisconsin (Baerreis and Freeman 1958) and Starved Rock Collared in northern Illinois (Hall 1962). Both Aztalan Collared and Starved Rock Collared types are suggested to date sometime around A.D. 1200.

While not totally dismissing the category Moccasin Bluff Collared in her analysis of the material from the Moccasin Bluff site, Brashler does suggest that some of the collared material from the site is more closely related to Allegan ware (Brashler 1981:244). She argues that a more complete data set is ultimately needed to resolve the relationship between Allegan ware and those ceramics in the St. Joseph valley which have been previously presented as the product of a separate cultural tradition (Brashler 1981:327). Brashler has examined the Dieffenderfer vessels and believes that these eleven are more like Moccasin Bluff Collared than Allegan ware (Janet Brashler,

personal communication). This similarity is especially apparent in the thickness, collaring and the profile of the rims.

Spring Creek Ware

A single Spring Creek Undecorated vessel (Vessel 62) accounts for a mere 1.7% of the classified Late Woodland material from the site. This vessel consists of a single upper rim fragment recovered from level two of Test Unit 99 in Zone B (Appendix B: Fig.21 A, Fig.40A). The rim displays a vertically cordmarked exterior and a plain/smooth interior. The lip area also is cordmarked. No evidence of decoration was observed on the interior, exterior or lip areas. The rim is thickened in the form of a very subtle collar which appears to have been created by molding. In cross section, the rim is slightly everted. The lip is flat in profile and displays no indication of being castellated. Temper is comprised of a coarse mixture of black and white grit.

Spring Creek is a Late Woodland ware commonly found in the Grand and Muskegon River drainages. The ware was originally defined by Brashler (1981) from material recovered at the Spring Creek site in Muskegon County and the Spoonville and Zemaitis sites located on the Grand River in Ottawa County. Spring Creek ware is a product of the Spring Creek ceramic tradition (Brashler 1981:331). Several key attributes characterize this ceramic tradition, including a low frequency of exterior decoration, and a high frequency of rolled and collared rims, and everted rims.

Collaring was originally a defining attribute for the type Spring Creek Collared, as proposed by Fitting. Fitting believed this type was “representative of a widespread cordmarked collared horizon in the early Late Woodland” (Fitting 1968:23). Both Fitting and Brashler (1981:325-326) suggest a similar developmental sequence for collared Spring Creek ware, noting that folded collars occur earlier in the sequence and true (or

molded) collars appear later during the early Late Woodland period. Brashler suggests collared forms of Spring Creek ware are quite common in southern Michigan, but she feels that they do not “constitute a mutually exclusive ceramic type or variant” (Brashler 1981:354). In her analysis, Brashler identifies and defines two constituent types of Spring Creek ware: Spring Creek Decorated and Undecorated.

The relationship of Spring Creek ware to other early Late Woodland ceramics is not completely understood. Fitting originally identified similarities between material at Spring Creek and Wayne ware from southeastern Michigan. Brashler feels that while this southeastern Michigan relationship can be supported, Spring Creek ware is more closely related to Allegan ware (and the Allegan tradition) in the Kalamazoo River drainage. Brashler also suggests possible connections with early Late Woodland material from northern Michigan, identified as Bowerman ware. She (1981:354) suggests Spring Creek ware was being produced in southern Michigan between A.D. 500 and A.D. 1000, and possibly somewhat later. This date is supported by collared material from the Spring Creek site associated with a radiocarbon date of A.D. 960 (Fitting 1968:67) and similar material from the Moccasin Bluff site dating to this same period (Bettarel and Smith 1973:114).

Miscellaneous Unclassified Late Woodland Vessels

A total of 19 (or 24.4%) Late Woodland vessels used in the cluster procedure could not be confidently assigned to a specific ware category (Appendix B: Fig. 22A-J, Fig. 23A-I, Fig. 41A-J, Fig. 42A-I). These vessels (Vessels 6, 7, 13, 16, 18, 20, 27, 28, 30, 34, 40, 41, 50, 54, 56, 60, 74, 77, 83) have been defined as “Miscellaneous Late Woodland” given their attributes which include grit tempering, cordmarked exteriors and collaring. All nineteen vessels are visibly void of decoration. These vessels may possibly

fall within the range of Dieffenderfer Undecorated, variants cordmarked and smoothed over cordmarked or may be related to Allegan or Moccasin Bluff ware. However, the small size and fragmented condition of the sherds precludes an accurate identification for these vessels.

Mississippian/Upper Mississippian Ceramics

Three vessels were classified as Mississippian or Upper Mississippian in origin based on their ceramic attributes; they were excluded from the cluster analysis in light of their cultural relationship. All appear to share affinity with established Mississippian or Upper Mississippian ceramic types. Two of these display characteristics like Upper Mississippian forms from the Kankakee valley in northeastern Illinois and northwestern Indiana, attributable to the Fisher culture (Faulkner 1972). The third vessel exhibits traits more suggestive of ties to Middle Mississippian groups located in the Illinois valley and the American Bottom. A brief discussion of each of these vessels and their cultural relationships follows.

Fisher Ware

One vessel in the assemblage displays attributes similar to Fisher Trilled, an Upper Mississippian ceramic type attributed to Fisher Ware. Vessel 17 is represented by an upper rim section consisting of three small rim sherds and a single neck sherd fragment (Appendix B: Fig.24B, Fig.43B). One of the rim sherds was recovered from within the limits of the 1993 housefloor (Feature 4); the two remaining rim fragments and the body sherd were collected from the second level of Test Unit 17 situated approximately 10 meters east of the housefloor area. The rim is characterized by a plain, lightly smoothed exterior and interior surface. The lip has been similarly treated. Temper is composed of

medium sized particles of a white grit. Decoration is visible on the exterior surface of the rim in the form of a curvilinear, arch-like motif (i.e., festoon) consisting of two lines; the placement of the motif appears to encircle the vessel. The motif was created by incising/trailing using a sharp edged or pointed implement. On the neck area is a horizontal row of punctates produced by impressing the end of a cordwrapped tool lightly into the clay. The punctates are very subtle and do not penetrate the wall of the vessel; they do not create a noded effect on the interior surface. No evidence of decoration is visible on the lip or the interior of the vessel. The rim is slightly to moderately everted in profile and exhibits no evidence of thickening or castellations. The lip is rounded in cross section. The orifice of the vessel is estimated to range from 16-30 cm in diameter.

Fisher Trailed is an Upper Mississippian form produced by Oneota-related Fisher groups in the Kankakee valley region of northeastern Illinois and northwestern Indiana (Faulkner 1972:177; J. W. Griffin 1946:14-16). Fisher ware was originally identified by George Langford (1927:177) at the Fisher site in Will County, Illinois, near the confluence of the Kankakee and DesPlaines Rivers. Fisher Ware is predominantly a shell tempered form, although some grit tempered forms are known (see below). The decorative motif employed on Fisher Trailed, and Fisher ware in general, is a curvilinear festoon or arch located between the neck and the shoulder of the vessel. In some instances, a combination of widely spaced vertical and perpendicular lines bordered by elongated punctates are used to complement the motif (Faulkner 1972:61). Rims may take many different forms. Vessels may be either flaring (i.e., excurvate), slightly flaring, straight, slightly cambered and/or collared. Aside from some lip notching and/or appendages, most rims are undecorated.

Fisher Trailed is closely related to the Illinois ceramic type Heally Trailed (Faulkner 1972:189). Heally Trailed is different from Fisher Trailed in that vessels more typically are cordmarked and display a single "meander" accompanied by reed and stick

punctuation. Fisher Trailed is also distantly related to the later Fisher type "Fifield Trailed" (Faulkner 1972:189). Fifield Trailed lacks the more curvilinear decoration which typifies Fisher Trailed forms in favor of closely spaced, vertical and horizontal trailed lines intervened by interrupted chevrons, horizontals and punctuation. Generally speaking, Fifield Trailed is more intimately related to classic Oneota ceramic forms from Wisconsin than the types Fisher Trailed and Heally Trailed (Faulkner 1972:189).

Fisher Trailed-like forms have been recovered at sites throughout the Upper Illinois and Kankakee drainages, including the Griesmer and Yahl sites in Lake County, Indiana (Faulkner 1972:61), the Plum Island site in LaSalle County, Illinois (Fenner 1963:55), the Lawrence site in Whiteside County, Illinois (Faulkner 1972:159), and the Fisher site (J. Griffin 1966: Plate CXXXVI, Plate CXXXVIII). Fisher Trailed forms have also been recovered in southwestern Michigan at the Allegan Dam site (Spero 1979), the Hacklander site in the lower Kalamazoo valley (Kingsley 1977) and the Moccasin Bluff site in the St. Joseph valley (Bettarel and Smith 1973). This vessel is atypical of Fisher ware in that it is grit as opposed to shell tempered; however, the decorative motif strongly suggests Fisher influence. Similar grit tempered Fisher-related forms have been identified in central Indiana (see Griffin 1966) and at the Hacklander and Moccasin Bluff sites and at the Fisher site. Kingsley suggests the material from Hacklander is "indicative of a small or transient occupation by a Mississippian or Oneota-related people" (Kingsley 1977:141).

The chronological position of Fisher Ware is fairly well established. The majority of Fisher-related sites in northeastern Illinois date between A.D.1250-1350 (Jeske 1989:388). The earliest dates for Fisher Trailed pottery were obtained on material from the Lawrence site, with dates clustering between A.D. 1160 to A.D. 1270 (Faulkner 1972:190). This temporal range is consistent with the radiocarbon date of A.D. 1222 from the 1993 housefloor at Dieffenderfer where portions of this vessel were recovered,

strengthening the interpretation that this vessel may be Fisher-related.

The second vessel with affinity to Upper Mississippian ceramics is Vessel 93. This vessel is currently unclassified, but shares affinity to the Fisher ware type Fisher Cordmarked. It is represented by a very small, shell tempered cordmarked body sherd (Appendix B: Fig.24C, Fig.43C). The sherd was recovered from Feature 4 in Test Unit 53. The paste is composed of very fine material tempered with laminar-shaped flakes of crushed shell. It appears to be an upper neck sherd based on its angularity. It displays an unmodified cordmarked exterior and a smooth interior. There is no evidence of decoration on the sherd.

This vessel may share some affinity with material recovered at the west knoll of the Wymer site, where several shell tempered, cordmarked and undecorated vessels have been recovered (Garland 1991:3-4, Figure 4). Garland has likened this material to the Upper Mississippian ceramic type Fisher Cordmarked. The primary difference, she notes, is that the Wymer vessels lack the typical Fisher decorative motifs and appendages (Garland 1991:5). Garland (1991) also notes similarities between the Wymer material and cordmarked, shell tempered vessels at Moccasin Bluff, believed to have been present at the site sometime around A.D. 1050 (Bettarel and Smith 1973:153). She notes the presence of lip notching on the Moccasin Bluff material and an absence of lip notching on the material from Wymer. Because lip notching more frequently occurs on material from Moccasin Bluff that can be assigned to the later Berrien Phase, she feels that this is evidence for the Wymer material being earlier than the ceramics from Moccasin Bluff. Radiocarbon dates at Wymer, ranging from A.D. 985 to A.D. 1150, tend to support her conclusions (Garland 1991:4).

Middle Mississippian

One vessel in the assemblage appears to be of Middle Mississippian origin. This vessel (Vessel 5) is represented by a very small upper rim sherd and 44 body sherd fragments (Appendix B: Fig.24A, Fig.43A). The rim was recovered in the second level of Test Unit 4 located immediately north of the housefloor (Feature 4) in Test Unit 53. Of the body sherds represented, the majority (n=21) were retrieved from Feature 4-A, a small depression within the limits of the floor. The remaining body sherds were recovered from either Test Units 1 and 4 or they were found in units located further to the east (e.g., Test Units 26 and 35) of this structure.

Vessel 5 is tempered with very finely crushed, laminar-shaped shell fragments. The shell has been subsequently leached from most of the sherds following their deposition in the ground, resulting in a platy texture. In a few instances, particles of shell are still visible in cross section. The body sherds are quite thin (approximately 2 mm) and are characterized by a blackened, heavily burnished (i.e., polished) exterior. No evidence of decoration is visible on the body sherds. The exterior surface of the rim is also heavily smoothed, but unlike the body sherds it displays a subtle reddish tint suggestive of red-filming or paint. The lip also displays evidence of smoothing and filming. The interior is void of decoration. The lip is flat in planview and slightly thickened. The rim displays some indication of incurving (i.e., inversion), but an accurate description is not possible given the size of this specimen. The contour of the rim and the curvature of the body sherds are suggestive of a small bowl form.

Vessel 5 shares affinity with the Middle Mississippian ceramic type Powell Plain. Powell Plain is a shell tempered, burnished, typically undecorated Mississippian ceramic form. Vessels of this type are typically jars although some bowl forms do occur. This type is intimately related to Mississippian ceramic developments in the American Bottom,

most notably at the Cahokia site. Powell Plain was “introduced” during the Lohmann phase (ca. A.D. 1000-1050) and achieved its greatest popularity during the Stirling phase (ca. A.D. 1050-1150) in the American Bottom region (Fowler 1991:24). Powell Plain is connected to Ramey Incised, a decorated variant; both are considered diagnostic markers of the Stirling phase (Fowler and Hall 1975). The Dieffenderfer vessel is unlike Ramey Incised in that none of the sherds associated with this vessel appears to display the incised decorative motifs which characterize this type.

It was during Lohmann, Stirling and the subsequent Moorehead phase (ca. A.D. 1150-1250) that these Middle Mississippian ceramic types were distributed northward from Cahokia into the Upper Mississippi valley and beyond (Kelly 1991a:87). Both Powell Plain and Ramey Incised vessels have been recovered at a number of sites extending from the upper Great Lakes region south to Mississippi and from southwestern Ohio west to northwestern Iowa and eastern Oklahoma (Kelly 1991b:67). In Michigan, material similar to Ramey Incised and Powell Plain has been recovered at the Juntunen site in the Straits of Mackinac (McPherron 1967) and the Sand Point site in Baraga County (Dorothy 1981).

*Also Dunn
Farm (Brook
87?)*

A Powell Plain-like vessel was recently recovered from the Wymer site in the St. Joseph valley (Garland 1991:5). This vessel, represented by three small shell tempered sherds, is described as a smoothed surface, black-colored burnished vessel. The Wymer vessel is unlike the Dieffenderfer pot in that it does not exhibit evidence of red-filming on its exterior; however, as Garland notes, red-filmed ceramics is evident on a plain, shell tempered body sherd and two shell tempered rims at Wymer. Red-filming is a surface treatment which originated in the Middle Mississippi valley. Garland notes similarities between the Wymer red-filmed material and pottery at the Hoxie Farm (see Herold et al. 1990:34) and Anker sites (see Bluhm and Liss 1961:106-107) in the upper Illinois valley and the Moccasin Bluff site (Bettarel and Smith 1973: Plate 80).

Garland attributes the presence of the Powel Plain-like vessel at the Wymer site to influence or direct contact with Middle Mississippian groups in the upper Illinois valley or the Wabash valley to the south, sometime between A.D. 1000 and A.D. 1100, where Powell Plain vessels more frequently occur (Garland 1991:7). The presence of a Powell Plain-like vessel at Dieffenderfer suggests a somewhat later date at the site based on its recovery in Feature (the 1993 housefloor); the late 12th and 13th century radiocarbon date obtained on this feature suggests this vessel may be coeval with the Moorehead phase during the decline of Middle Mississippian influence.

Miscellaneous Unclassified Ceramics

A total of nine vessels from the assemblage were not included in the cluster analysis because they could not be confidently assigned to a specific period. Eight of the vessels (Vessels 15, 19, 26, 29, 31, 37, 47, 91) were precluded from the analysis because they appear to represent miniature-like “finger” pots (Appendix B: Fig. 25A-H). They are represented by very small, rather non-descript rim sherd fragments which appear to lack any diagnostic attributes. Four of these vessels (Vessels 15, 19, 26, 37) are grit tempered, exhibit small collars, cordmarked exteriors, and are undecorated; these vessels are suggestive of a Late Woodland placement (Fig. 25:A-C, F). The remaining vessels (Vessels 29, 31, 47 and 91) display a very fine, silty paste, are temperless, have plain, undecorated exteriors and are collarless. These vessels maybe related to the Middle Woodland occupation of the site (Janet Brashler, personal communication)

The remaining vessel (Vessel 92) was excluded from the analysis because it is represented in the assemblage only by two body sherds (Appendix B: Fig. 26). It is briefly mentioned here in light of its atypical ceramic attributes, namely tempering. Vessel 92 consists of two limestone tempered, cordmarked body sherds collected during excava-

tions at the site by Mr. Jones. These sherds were easily identified during the analysis because they exhibit a very distinct white temper resembling limestone. The sherds were tested for the presence of limestone by applying a diluted hydrochloric acid solution to the exposed surfaces. When the solution was applied both sherds proved positive. Both of the sherds exhibit cordmarked exteriors, lightly smoothed interiors and an absence of decoration. These sherds represent the only material at the site which display limestone tempering.

Although this vessel cannot be classified according to an established ware or type based on its meager representation in the assemblage, this vessel is suggestive of some form of contact with Woodland cultural groups in the Illinois valley (Janet Brashler, personal communication). Limestone tempering is virtually absent in southern lower Michigan; the nearest source (or outcrop) for limestone is the Kankakee River valley in Illinois or possibly the Rock River Valley in northcentral Illinois, where Burlington limestone outcroppings are plentiful. Limestone temper is indicative of a Middle Woodland temporal placement, as most classic Hopewell ware in the Illinois valley is tempered with limestone, but the presence of exterior cordmarking suggests that this vessel may be Late Woodland in origin.

Summary

In sum, the distribution of ceramics at Dieffenderfer are as follows. Of the 95 minimum vessels in the current collections from the site, five (5.3%) are classified as Middle Woodland. The dominant Middle Woodland ware in the assemblage is Sumnerville ware, represented by four vessels (80%). Three of these Sumnerville ware vessels are decorated and one is undecorated. The remaining Middle Woodland vessel in the assemblage has been classified as Hopewell type Brangenburg Plain.

The Late Woodland material clearly dominates the assemblage, represented by 78 vessels, or 82.1% of the assemblage. The majority of this material, 59 (75.5%), was classified according to a specific Late Woodland ware category; the remainder of the Late Woodland material could not be confidently assigned to a specific ware, 19 (24.4%). Of the Late Woodland material which could be assigned, Dieffenderfer ware occurs most frequently, represented by 41 vessels (69.5%). This ware is represented by two types: Dieffenderfer Undecorated (28 or 68.3%) and Dieffenderfer Decorated (13 or 31.7%). Each of these types is accompanied by four variants. Dieffenderfer Undecorated is represented by variant Smoothed Over Cordmarked (13 or 46.4%), Cordmarked (11, 39.3%), Fabric Impressed (3 or 10.7%), and Plain (1 or 3.6%). Dieffenderfer Decorated occurs as variant Corded Tool Impressed (7 or 53.8%), Corded Tool Punctate (3 or 23.1%), Push-Pull (2 or 15.4%), and Incised (1 or 7.7%). This ware is followed in frequency by vessels attributable to Moccasin Bluff ware, 12 (20.3%). Of this ware, two types are present in the assemblage. These include 11 vessels of Moccasin Bluff Collared (91.7%) and one vessel of Moccasin Bluff Impressed Exterior Lip (8.3%). Of the collared vessels, 6 (54.5%) are undecorated and 5 (45.5%) are decorated. Allegan ware also occurs, comprising 8.5% of the Late Woodland assemblage; this ware is represented by 5 vessels of the type Allegan Undecorated and is accompanied by two variants including variant Undecorated Lip (n=2) and Undecorated Lip/Collared (n=3). The remainder of the Late Woodland material, represented by one vessel, was assigned to Spring Creek ware (1.7%) and is represented by the type Spring Creek Undecorated.

Three vessels in the assemblage have been classified as Mississippian (3.1%). These include one vessel of Middle Mississippi Powell Plain and two vessels assigned to Fisher ware. The Fisher ware in the assemblage is represented by two types including both Fisher Trailed and Fisher Cordmarked. The remaining vessels in the assemblage, 9 (or 9.5%) are regarded as unclassified. These include 8 miniature pots, four of which

may be Middle Woodland and four possibly Late Woodland; the remaining vessel is a cordmarked, limestone tempered pot with affinity to Woodland period ceramics in the Illinois valley.

CHAPTER V

DISCUSSION

The purpose of this chapter is to utilize the ceramic typology devised in the previous section to delineate the different cultural occupations represented at the Dieffenderfer site (including both Middle and Late Woodland) and to determine their relative temporal placement. Because of its predominance in the assemblage, particular attention will be given to the Late Woodland material. The primary goal is to interpret the cultural history of the site and attempt to assess its significance in relationship to other Late Woodland sites in the St. Joseph valley. The interpretation presented here is based on radiocarbon dates from the various occupations of the site and the spatial distribution of specific wares and types at the site.

Ceramic Distribution at Dieffenderfer

In order to facilitate an intra-site comparison of the ceramics from Dieffenderfer it was necessary to delineate the site area into zones. As previously discussed, these zones correspond to and demarcate those areas of the site where occupational activity (i.e., features) and ceramic density appear to be greatest. Determining the location of these zones and their approximate boundaries was accomplished by plotting those test units with relatively high sherd counts onto a site map. An arbitrary density above 15 sherds per unit was established as a minimum for inclusion in the sample. The sample chosen for assessment were those test units excavated during the 1993 and 1995 field seasons. The distribution of ceramic material in features at the site was estimated separately so as not to skew the results. Those sherds recovered by Mr. Jones were not included in the

sample simply because their exact provenience is not known.

The 1993/1995 ceramics are concentrated in three main areas or zones at the site; these have been identified as Zones A, B and C. These zones are comprised of a total of 26 test units (Test Units 1, 3-4, 7, 9-10, 35, 39-40, 48, 53, 68, 87, 91-93, 97, 99-100, 104, 107, 110-111, 116, and 122-123). Each of these zones is also associated with a cluster of features. In aggregate, these test units account for 6,677, or 96.8% of all sherds (6,900) recovered during the 1993/1995 field seasons. A discussion of each of these zones is presented below in terms of the distribution of body sherds and specific ceramic wares and types represented. This is followed by an interpretation of the zones as they relate to the cultural history of the site as a whole.

Zone A Ceramics

Zone A includes ten test units located in the extreme western area of the site, including Test Units 1, 3, 4, 7, 9, 10, 48, 53, 87 and 97. These units account for approximately 39.5 square meters, or approximately 16.9% of the total site area excavated to date. In sum, 2,989 sherds were recovered from these units. Of this number, 126 are rim sherds and 2,863 are body sherds. Over half of the body sherds from this zone (1,555 or 54.3%) were concentrated in Features 4, 4-A and 4-B, the housefloor area located in Test Unit 53. The remainder of the body sherds (1,308 or 45.7%) were recovered from test units surrounding the house. The distribution of material in this zone is problematic in that earlier backhoe excavation has no doubt altered the stratigraphic occurrence of pottery. Nonetheless, not all test units in this zone display evidence of prior disturbance suggesting some general statements can be offered regarding ceramics within this zone.

The distribution of the body sherds in Zone A in terms of surface treatment is

provided in Table 2 in Appendix C. Zone A is represented ceramically in Levels 1-4 (1-40 cm). The most intense occupation or activity is associated with the upper three levels, particularly Level 1. Each of these three levels exhibits a relatively equal distribution of body sherds; the average sherd count per level in this zone is 410 sherds. This figure drops off considerably in the lowest level (Level 4), with only 78 sherds represented.

Some changes in surface treatment are evident through time in this zone. Unmodified cordmarked surfaces predominate Levels 3 and 4. In contrast, this form of treatment is reduced in Levels 1 and 2, accompanied by a dramatic increase in sherds with smoothed over cordmarked surfaces. Smoothing also occurs in this zone as do sherds with plain exteriors; however, in terms of their distribution, they do not appear as popular as the cordmarked treatments. Both smoothed and plain exteriors decrease through time, occurring most frequently in level three. Fabric impression is present in Levels 1-4 and appears to be most popular later in time, comprising approximately 3-4% of levels one and two. A discrepancy occurs in Level 4 where fabric impressed sherds account for 19.2% of all sherds. This figure may be skewed by the fact that only 78 sherds occur in this level and most, if not all, are possibly from a single vessel. In sum, Zone A is dominated by body sherds with smoothed over cordmarked treatment (21.7%) and unmodified cordmarked exteriors (15.1%). Less frequently, smoothed (5.5%), fabric impressed (3.8%) and plain (2.5%) treatments occur. Unfortunately, unidentified sherds account for a very high percentage of those body sherds recovered from this zone, comprising 51.3% of the sample.

No distinct patterns in temper and decoration could be discerned from the distribution of sherds through Levels 1-4 of Zone A. Almost all of the body sherds recovered are grit tempered (1,295 or 99.0%), with only 13 (1.0%) specimens exhibiting shell temper. The latter are associated with all four levels in this zone and appear to be from a single vessel (Elizabeth Garland, personal communication). Of those body sherds

represented in Zone A, only three decorated specimens were identified. These include one sherd with a horizontal row of corded tool impressions on the interior wall of the vessel, a smoothed over cordmarked sherd with exterior trailing, and one cordmarked sherd with chevron-shaped corded tool impressions on the exterior. The first two sherds were recovered from the first and second levels of Test Unit 1 and may be from Vessel 3. The last sherd, identified in the Jones collection, exhibits a similar decorative technique and motif and may be from this same vessel.

Only three features are represented in Zone A; all are associated with the 1993 housefloor area (Features 4, 4-A, and 4-B). The total count for these features is 1,555 sherds, or 54.3% of all body sherds recovered in Zone A. The average count per feature is 518 sherds. In general, the distribution of ceramics in these features tends to parallel developments occurring in Levels 1 and 2 of this zone. The distribution of body sherds by surface treatment for those features in Zone A is provided in Table 3 in Appendix C.

Feature 4 is represented by 697 body sherds. Smoothed over cordmarking occurs most frequently, comprising 29.1% of those sherds collected from the housefloor. The remaining sherds are comprised of a slightly smaller percentage of specimens with unmodified cordmarked exteriors (18.8%) and much lower percentages of smoothed (5.5%), fabric impressed (2.7%), and plain (0.9%) sherds. Unidentified sherds account for 43% of all sherds from Feature 4. Nearly all of the body sherds in this feature are grit tempered (690 or 99%), with a minority of shell tempered sherds present (7 or 1%). Almost all body sherds are undecorated; the exception being one cordmarked sherd with exterior trailing.

Feature 4-A, a small pit, is associated with Feature 4 and is comprised of 546 body sherds. Smoothed over cordmarking appears most frequently (23.1%), followed by lower numbers of sherds with unmodified cordmarking (16.3%), smoothing (3.8%), and plain exteriors (0.6%). Noticeably absent from this feature are sherds with fabric

impressed exteriors. Body sherds with unidentified exteriors account for 56.2% of all sherds from Feature 4-A. Almost all of the body sherds from this feature are grit tempered (525 or 96.2%), with a very small percentage of shell tempered occurring (21 or 3.8%). None of the body sherds analyzed from this feature is decorated.

Feature 4-B, a small firepit (or hearth) associated with the housefloor, is represented by 312 body sherds. This feature exhibits a slightly different distribution than Features 4 and 4-A in that smoothed over cordmarked exteriors occur less frequently (17.3%) than unmodified cordmarked exteriors (47.1%). This difference may be due to the fact that a smaller number of sherds (and possibly vessels) appears to be represented in the feature as a whole. The remaining sherds exhibit smoothed exteriors (3.2%) and fabric impression (1.0%). Sherds with unidentified exteriors account for 31.4%, and sherds with plain exteriors are absent. All of the sherds are grit tempered; shell tempering has not been observed. Only one body sherd with exterior decoration was identified, consisting of a sherd with a plain, possibly lightly smoothed exterior and very finely detailed zoned decoration, applied with a pointed implement. This sherd is unique in the assemblage in that its form is suggestive of a lug or strap handle. This sherd could not be positively assigned to a particular vessel in the assemblage due to its small size and the fact that none of the other vessels recovered from Dieffenderfer has handles.

A total of 34 vessels are represented in Zone A, including Vessels 1-14, 17, 33-49, 53, and 93. All of the rim and body sherds attributable to these vessels appear to be associated with the house (Feature 4). By far, the Late Woodland ceramics predominate the sample from this area of the site. Of those wares represented, Dieffenderfer ware is the most frequent, consisting of 12 vessels (or 35.3% of those vessels in Zone A). Of those types present, Dieffenderfer Undecorated accounts for the majority of the vessels (8 or 66.7%) in the sample. The Dieffenderfer Undecorated variants present are smoothed over cordmarked (n=5); fabric impressed (n=2); and cordmarked (n=1). Dieffenderfer

Decorated (4 or 33.3%) is represented by three variants, including corded tool impressed (n=2), corded tool punctate (n=1), and push-pull (n=1).

Moccasin Bluff ware also occurs in Zone A, although somewhat less frequently (26.5%) than Dieffenderfer ware. It is represented by 9 vessels of two types. The first type, Moccasin Bluff Collared, occurs as two variants. The first lacks decoration (n=5) and the remaining vessels (n=3) represented a decorated variant. The type Moccasin Bluff Impressed Exterior Lip is also present (n=1). Allegan ware occurs in the form of two vessels (5.9%) classified as Allegan Undecorated variant undecorated lip/collared.

There is also a small sample of Mississippian-related ceramics represented in Zone A, consisting of 3 vessels (or 8.8%). Two of these are shell tempered; the remaining vessel is grit tempered. These vessels represent two different wares. The first ware is represented by examples of Upper Mississippian Fisher ware. This ware is evidenced by two vessels, each representing a different type, Fisher Trailed and Fisher Cordmarked. A small Middle Mississippian bowl, possibly Powell Plain, is also present. The remainder consists of two (5.9%) small miniature vessels and six (17.6%) Late Woodland vessels which could not be confidently assigned to a specific ware category. This latter group includes one vessel exhibiting limestone temper and a cordmarked exterior.

Zone B Ceramics

Zone B is delineated by twelve test units located at the eastern end of the enclosure including Test Units 35, 39, 40, 68, 91, 92, 93, 99, 104, 107, 116 and 123. These units account for approximately 43.1 square meters, or 18.4% of the total site area excavated to date. In aggregate, 2,880 sherds were recovered from these units. Of this total, 153 are rim sherds and 2,727 are body sherds. Most of the body sherds were recovered from

test unit levels (2,606 or 95.6%). Those remaining body sherds were recovered from feature contexts (121 or 4.4%). The distribution of body sherds by level, in terms of surface treatment, is provided in Table 4 in Appendix C.

Zone B is represented ceramically in Levels 1-6 (1-60 cm). The most intense occupational activity in this zone appears to be in the upper levels, and most notably in Levels 1 and 2. The average body sherd count for these two levels is 1,250; proportionately less intense activity is suggested by the distribution of sherds through levels 3-6 as sherds steadily decline in frequency. Analysis of sherds from the upper levels of Zone B suggests that unmodified cordmarked surfaces predominate in Levels 2 and 3 (approximately 25%), with a decline in level one as smoothed over cordmarking becomes more frequent. Smoothed surfaces appear in the upper three levels of this zone and occur most frequently in Level 1, comprising 9.5% of the sample. Fabric impressed sherds also occur in Levels 1, 2 and 3 and account for approximately 8-11%. Plain surfaces occur rather infrequently in the upper levels, being most common in the lower levels of this zone. In sum, this zone is dominated by body sherds with smoothed over cordmarked treatment (21.5%), followed by unmodified cordmarking (19.7%), smoothed (6.1%), fabric impressed (9.4%), and plain (2.7%). Unidentified sherds account for a considerable percentage, comprising 40.6% of the sample.

There appears to be no distinct pattern for tempering in Zone B. Grit temper accounts for the majority of the material represented in this zone (2,590 or 99.4%). Sand tempering is represented by 13 (0.5%) specimens, and shell tempered sherds (0.1%). Shell tempered sherds were identified in Levels 2 and 3, and sand tempering appears in sherds recovered from Levels 1, 2, 3, and 5. In most instances, they comprise less than 1% of the sample from each of these levels. None of the Zone B body sherds exhibit any form of decoration on the interior or exterior surface. It is notable that a large fragment of fired clay identified as daub was recovered from Level 6 in Test Unit 40. The specimen

has a fine, sandy paste and no identifiable temper inclusions; it appears to have been bonded or mixed with a fibrous material, possibly wood. It is tempting to suggest that this material was used to construct the house located in this zone (Feature 16). However, similar material was not identified in any other units or features in this zone. Alternatively, it may simply represent a discarded piece of clay unintentionally fired during pottery manufacture at the site.

A total of six features are represented ceramically in Zone B, including Features 7, 9, 8, 12, 14, and 16-B. The distribution of body sherds within these features is presented in Table 5 in Appendix C. As stated previously, all features are notable for a low frequency of ceramics, accounting for a mere 4.4% of all body sherds recovered in this zone. The average body sherd count per feature in this area is 20. Given this low frequency, it is extremely difficult to make meaningful comparisons and interpretations. However, some general statements can be offered. The two features (Features 7 and 9) with the most ceramic material revealed a high percentage (45%) of fabric impressed specimens. This observation may be biased by the fact that between both pits a single vessel is probably represented. Cordmarking occurs in all features represented in this zone. There may be a preference for smoothed over cordmarked treatment, but this is unclear given the small sherd counts. Smoothing also occurs in all but Features 8 and 14. Only one plain body sherd was recovered from this area, having been recovered from Feature 14. All of the body sherds recovered from these features are grit tempered; no sand or shell tempered specimens were identified. Body sherds with exterior and/or interior decoration were also absent.

In sum, 30 vessels are represented in Zone B, including Vessels 20-32, 54-58, 61-62, 67, 70-74, and 77-80. Almost half (13 vessels, 43.3%) of the vessels recorded for this zone is comprised of Dieffenderfer ware. The type Dieffenderfer Undecorated occurs most frequently (n=9, or 69.2%) and is represented by four variants. These include:

variant smoothed over cordmarked (n=4); variant cordmarked (n=3); variant fabric impressed (n=1); and variant plain (n=1). Dieffenderfer Decorated is represented by four vessels (30.8%) and one variant, corded tool impressed.

Other Late Woodland material attributable to Zone B consists of vessels previously described for southwest Michigan. These include single examples of Moccasin Bluff Collared (decorated), Allegan Undecorated (undecorated lip/collared variant), and Spring Creek Undecorated (undecorated lip/collared variant). The remaining Late Woodland material comprises eight vessels (or 26.7%) which could not be assigned according to a specific ware category. Material other than Late Woodland includes three Middle Woodland vessels and three vessels representing miniature finger pots. Two of the Middle Woodland vessels are examples of Sumnerville ware. The remaining vessel is Hopewell ware type Brangenburg Plain.

Zone C Ceramics

Zone C is delineated by four test units situated at the northwestern end of the enclosure, including Test Units 100, 110, 111 and 122. These units account for 15.5 square meters, or approximately 6.6% of the total site area excavated to date. In sum, 808 sherds were collected from these test units. Of this number, 54 are represented by rim sherds and 754 by body sherds. Most of the body sherds from this zone are attributable to individual features (617 or 81.8%) as opposed to test unit levels (137 or 18.2%). The distribution of these sherds in terms of surface treatment is provided in Table 6 in Appendix C.

Zone C is represented ceramically by Levels 1-3 (1-30 cm). Overall, a very low frequency of sherds is indicated by distribution patterns, suggesting an occupation(s) of low intensity in this area. The low density of sherds throughout this zone precludes an

accurate interpretation; only some general statements can be offered. Of those sherds represented, smoothed over cordmarked treatment is preferred. This form of treatment is consistently the most popular, comprising roughly 48-77% of the sample, followed by smaller numbers of unmodified cordmarked sherds (17-22%). Smoothing initially appears in Level 2 and becomes more popular in Level 1. Fabric impression also appears in Level 2 and is most abundant in Level 1 (6.2%). Plain sherds are present in Levels 2 and 3 in low, but relatively equal numbers, but are notably absent from Level 1. In sum, Zone C is dominated by smoothed over cordmarked treatments (57.7%), with lesser amounts of unmodified cordmarking (20.4%), smooth (1.5%), fabric impressed (1.5%), and plain (2.9%) treatments. Unidentified specimens account for the remaining 16%. All sherds are grit tempered and lack decoration.

Three features with ceramics occur in Zone C. These are Features 10, 13 and 17. The distribution of body sherds between each of these features is generally comparable, but a much higher number of body sherds were recovered from Feature 10 (Appendix C: Table 7). The material recovered from these features tends to mirror observations occurring in the test units which include these features. Smooth over cordmarking is the preferred treatment, occurring on roughly 50-70% of identified sherds. Unmodified cordmarking appears less frequently, being absent from one feature (Feature 17), and with densities under 10% in the other two pits. Smooth and plain sherds are rare to non-existent and fabric impressed examples also occur infrequently, save for Feature 13 in which 37.5% of the sherds have been fabric impressed. This figure is probably skewed by the low sherd count (32) in the feature. The sherds recovered from these features are all grit tempered. No evidence of sand or shell tempering was identified during the analysis. All lack decoration, save for those body sherds assigned to Vessel 63 from Feature 10 (Test Unit 100).

A total of seven vessels are represented in Zone C, including Vessels 63-66, 75-

76, and 95. Of the Late Woodland material represented in the sample, Dieffenderfer ware predominates, comprising five vessels (or 71.4%). The three vessels of type Dieffenderfer Decorated (n=3) include variants incised, corded tool impressed and corded tool punctate. Dieffenderfer Undecorated is also present, being represented by two vessels of variant smoothed over cordmarked. The last Late Woodland vessel present in the sample from Zone C is an example of Allegan Undecorated (undecorated lip/collared variant). Finally, a pot of Sumnerville ware (plain rocker stamped) has also been identified in the sample from this zone.

Jones Collection

Although no provenience information is available, a description of the Jones collection is warranted in light of its recovery in close proximity to Zone A. The collection consists of 1,088 sherds; 1,024 (94.1%) are body sherds and 64 (5.9%) are rim sherds. The majority of the body sherds are smoothed over cordmarked (33.9%), followed in declining frequency by sherds with unmodified cordmarked surfaces (26.0%), plain (9.7%), fabric impressed (3.0%), and smoothed (0.8%); the remainder (26.6%) have been classified as unidentified. Almost all of the sherds are grit tempered (99.8%); two limestone tempered sherds are attributable to Vessel 92. Most of the sherds in the collection lack any decoration (983 or 96%); 41 sherds exhibit some form of exterior (n=39) or interior decoration (n=2). Of those sherds with exterior decoration, 35 display smoothed over cordmarked exteriors with mixed (i.e., variable) incising or trailing. Two of these are accompanied by a series of interior corded-tool impressions and have been attached to Vessel 3. Most, if not all of these exterior decorated sherds, may be from this same vessel. One cordmarked sherd in the collection exhibits corded-tool impressions in the form of a chevron motif on the exterior. Another sherd has a series of parallel

corded-tool impressions on a cordmarked exterior. Two smoothed cordmarked sherds display exterior crosshatched incising. Interior decoration exists on two smoothed over cordmarked sherds in the form of corded-tool impression.

There are a minimum of 12 vessels represented in the Jones collection; seven of these have been classified as Dieffenderfer ware. Both undecorated (n=5) and decorated (n=2) variants are present. Dieffenderfer Undecorated is represented by variant cordmarked (Vessels 81-82, 84-86). Dieffenderfer Decorated occurs as variant push-pull (Vessel 88) and variant corded tool punctate (Vessel 89). Also included in the collection are one vessel attributable to a decorated variant of Moccasin Bluff Collared (Vessel 87), one vessel of the type Allegan Undecorated (undecorated lip variant), two unclassified Late Woodland vessels (Vessels 83, 92) and a miniature finger pot (Vessel 91).

Ceramics and the Cultural History of the Dieffenderfer Site

Several factors make it difficult to interpret patterns of change and development through time, thus precluding an accurate interpretation of the cultural history of the Dieffenderfer site. To begin with, most of the ceramic material recovered from the site was recovered from test units at depths considered to be relatively shallow, most frequently between 1-30 cm beneath the surface. Below these depths, most units were culturally sterile. The fact that most of the ceramics were relegated to the first 30 cm suggests the site is not deeply stratified. Conversely, this increases the probability that cultural material is, at best, mixed. Related to this is the fact that specific areas of the site also evidence re-use (i.e., multiple occupations) over time. This has, no doubt, resulted in the disturbance of underlying occupations. This disturbance is indicated by a mixture of earlier and later ceramics within levels of various test units and, in some instances, prehistoric and historic material.

Additionally, less than one third (2,421 or 30.3%) of the total sherds collected from the site during the 1993 and 1995 field seasons were retrieved from feature context. The majority (5,572, or 69.7%) were recovered from test unit levels. Of those features which did contain ceramic material only three have been radiocarbon dated. This fact precludes an accurate temporal assignment for most of the features at the site. Further, an analysis of the lithic material from the site has yet to be undertaken, and information regarding seasonality and subsistence patterns from botanical and faunal analysis of flotation samples has not been completed. As a result, the interpretation presented here is based almost exclusively on analysis of the ceramic material and available radiocarbon dates.

Earlier occupations of the Dieffenderfer site are suggested to have occurred during the Archaic and Early-Middle Woodland periods. These occupations are represented by diagnostic lithic artifacts including an Archaic bifurcate base projectile point attributable to the LeCroy cluster and several side-notched and corner-notched or expanding stem forms of the Early and Middle Woodland periods (Cremin and DesJardins 1994:10). Most of this material, together with a number of unifacial endscrapers, was recovered in test units located in the central portion of the site in the vicinity of Zone B. An analysis of this material has not been completed and its significance is yet to be determined.

Of the earlier occupations, only the Middle Woodland period is represented by ceramic material. This occupation is evidenced by five vessels all but one of which were collected in the vicinity of Zone B. The four Sumnerville rocker stamped vessels and the single pot of Brangenburg Plain suggest occupation by a small, local Middle Woodland group with limited ties to Hopewellian groups in the Illinois valley. The occurrence of these vessels at the site suggests an occupation sometime between A.D. 100-300, which is coeval with the later end of the western Michigan Norton Phase. This phase is

contemporaneous with the occurrence of Brangenburg Plain during the middle-late Hopewell period (ca. A.D. 100-300) in the Illinois valley. None of the features identified in Zone B appears to be related to this Middle Woodland occupation; very little can be said about this occupation other than it does not appear to have been long-term or intensive based on its meager representation in the ceramic assemblage.

Thereafter, the site appears to have been unoccupied for an extended period of time. The next occupation is Late Woodland, occurring around A.D. 1000 or shortly thereafter. This occupation is represented by the cluster of features immediately west of the 1995 housefloor (excluding this feature and its associated features). Two of the features associated with this cluster (Features 9 and 12) are identified as bark-lined, cylindrical storage pits. Feature 9 was radiocarbon dated, yielding a calibrated age of A.D. 1025, with a range of 1004-1156. Feature 12 is probably contemporaneous with Feature 9 based on its very similar morphology. The other features (Features 3, 5, 7, 8, 14, and 18) in the immediate vicinity of these two features may be related to this particular occupation or may represent multiple reuse of this area over time. The precise function of Features 3, 5, 14 and 18 is unknown. Features 7 and 8 are interpreted to represent a hearth or firepit and a small food processing facility, respectively.

Not much can be said regarding the cultural relationships or ceramic developments associated with this occupation. The only feature containing diagnostic ceramic material is Feature 9. It contained upper rim and body sherds from Vessel 24, classified as Dieffenderfer Undecorated variant fabric impressed. The association of this vessel with this feature and radiocarbon date appears contradictory given the calibrated radiocarbon age of A.D. 1025. Rather, this vessel should relate to the later occupation of this zone associated with the housefloor (Feature 16), given the thickness of its collar and the higher frequency of fabric impressed sherds in the upper levels of this zone. It is possible that this vessel was included with the feature as a result of fortuitous

backfilling during multiple reuse of this area over time. The Spring Creek vessel (Vessel 62), collected from Test Unit 99 may be associated with this occupation given that the 14th century radiocarbon date obtained from the 1995 housefloor (Feature 16-B) is considered late for Spring Creek ware. However, this is purely speculation given that this vessel was not directly associated with any of these features.

The lack of datable radiocarbon samples precludes an accurate temporal assignment for these features. A Late Woodland temporal placement can be tentatively suggested for Features 7, 8, and 14 based on a mixture of cordmarked and smoothed over cordmarked body sherds in the context of feature fill; however, this association is based on the assumption that this material was not accidentally included with fill as well. It is notable that none of these features produced an appreciable number of ceramics, suggesting that occupation was neither intensive nor long term. It is possible that these features represent several occupations over time and may have been seasonal in nature. Alternatively, the low occurrence of sherds may be related to feature function. Analysis of flotation samples collected from these features may contribute towards a better understanding of seasonality and the subsistence behavior of the individuals responsible for this occupation.

Following occupation(s) of Zone B during the 11th and early 12th centuries, the occupation shifts to Zone A at the opposite end of the enclosure where a second house (Feature 4) and its associated features (Features 4-A, 4-B) occur. The calibrated radiocarbon age obtained for Feature 4-B, a small pit, is A.D. 1222 (with a range of 1165-1276). This date suggests that occupation of Feature 4 is contemporaneous with the later portion of the Moccasin Bluff phase (ca. A.D. 1200-1300) as defined by Bettarel and Smith (1973:153). This late 12th century and 13th century temporal assignment is supported by the ceramic material collected in the features, themselves, as well as in those test units located in the immediate vicinity of the house.

The ceramic material associated with this zone suggests interaction (i.e., contact or influence) with groups to the southwest and populations located either to the north or to the east. The strongest relationship appears to be with Lake Forest Late Woodland peoples in the Straits of Mackinac area associated with the Huron. This is suggested by a high frequency of Dieffenderfer ware (35.3%) in the sample of Late Woodland ceramics from this zone. This figure is probably higher given that the Jones collection is not included in the estimates for Zone A; Dieffenderfer ware accounts for nearly 60% of those vessels comprising the Jones collection. Possible influence from the north is also represented by the presence of two Allegan Undecorated (undecorated lip/collared) vessels in this zone, suggesting some form of relationship with Allegan tradition groups in the lower Kalamazoo valley.

A somewhat less intense relationship to the west, possibly with groups at Moccasin Bluff, is suggested by the presence of Moccasin Bluff ware in Zone A. Moccasin Bluff ware, including the types Moccasin Bluff Collared and Moccasin Bluff Impressed Exterior Lip, constitutes 26.5% of the vessels found here. The latter type occurs most frequently at Moccasin Bluff after A.D. 1100 (Bettarel and Smith 1973:114). A more distant cultural relationship with Upper Mississippian Fisher groups to the southwest is also indicated. Vessels with affinity to Fisher Trilled and Fisher Cordmarked suggest some form of interaction with groups along the Kankakee River in northwestern Indiana and northeastern Illinois. The occurrence of the shell tempered Powell Plain-like bowl possibly suggests a much more distant relationship with Middle Mississippian groups in the American Bottom.

The occupation represented in Zone A appears to be more intensive than the earlier occupation in Zone B. This is suggested by a much higher sherd to feature ratio and a higher frequency of sherds and vessels in test units in the immediate vicinity of the house area. Zone A appears to have been occupied by a small group perhaps consisting

of one or two families. This estimate is consistent with the size of the structure and the number of features associated with the house. The presence of children is suggested by the occurrence of two small mini-pots in this area. Evidence of a substantial house suggests some degree of permanence. A preliminary analysis of flotation samples collected from features associated with the house included nutshell, animal bone (possibly deer), fish remains (possibly sturgeon) and turtle. A warm weather occupation, possibly from spring through the fall, is tentatively suggested based on this evidence. A more detailed description of the botanical and faunal evidence should provide a better understanding of seasonality and the subsistence behavior of the occupants of Zone A.

Developments following the occupation of Zone A suggest Zone B was re-occupied at the end of the 14th century, immediately following abandonment of the house in Zone A. This is suggested by calibrated radiocarbon ages of A.D. 1315, 1347, and 1390 with a range of 1295-1408 for Feature 16-B, a hearth/firepit centrally located in the 1995 house (Feature 16). The calibrated ranges for the two housefloors do not overlap. This observation, combined with a different choice of living areas and houseforms, would seem to argue against a relationship, but the ceramic evidence suggests otherwise. Similar cultural relationships posited for the occupants of Zone A were continued by these Zone B residents.

While ceramic density per square meter excavated in this zone is proportionately less in comparison to Zone A, relationships with Lake Forest Late Woodland and/or Huron-related peoples appear to have been more pronounced in Zone B when compared to Zone A. This is evidenced by an increase in Dieffenderfer ware, comprising 43.3% of the sample, as compared with a frequency of 35.3% in Zone A. This increase is accompanied by a decline in both Allegan and Moccasin Bluff wares and an almost complete absence of shell tempered, Mississippian ceramic material in this zone. Thus, while interaction with groups to the north and/or east increased, relationships to the south

and west decreased substantially.

The Zone B occupation appears to have been as equally intensive as that represented in Zone A. This is suggested by a similar house size and a relatively equal ratio of ceramics and vessels per square meters excavated. The house was probably occupied by a group consisting of one or two families. Children appear to have been residents in this area as indicated by the presence of miniature vessels. The period of occupation appears to have been during the spring or summer months based on the presence of turtle remains in Feature 16-B; the absence of carbonized nutshell from the context of the housefloor tends to preclude occupation during the fall. Analysis of flotation samples from features associated with the Zone B house should allow for more meaningful statements regarding subsistence and seasonality of its occupants.

The cluster of features located in Zone C are problematic in that all are undated; however, the ceramic material associated with these features suggests they are probably related occupations of both Zones A and B. Most of the material from this zone is related to Dieffenderfer ware (71.4%). Feature 10, a refuse pit, evidences Dieffenderfer Undecorated and Decorated (variant incised) as well as Allegan Undecorated (undecorated lip/collared). Feature 13, a pit with a substantial quantity of mollusk (i.e., clam) shell, also contained Dieffenderfer Decorated (variant corded tool impressed). Feature 17, also identified as a pit, included one vessel identified as Dieffenderfer Decorated (variant corded tool punctate). Based on these ceramic associations a late 12th century through 14th century temporal placement can be assigned to these features. Seasonality is presently unknown for these features, but the quantities of clam shell in Feature 13 argue for a spring-summer occupation.

CHAPTER VI

CONCLUSIONS

Radiocarbon dates from Dieffenderfer (20SJ179) suggests that most of the occupations of the site are contemporaneous with the Late Woodland Moccasin Bluff phase (ca. A.D. 1050-1300/1400), as defined by Bettarel and Smith (1973:153) at the Moccasin Bluff site in the lower St. Joseph valley. However, based on an analysis of the ceramics, cultural developments and interaction patterns at the site were different compared to those sites in the lower valley during the Late Woodland period.

The Late Woodland ceramics from Dieffenderfer suggest that social ties with Iroquoian-related (i.e., Huron) groups to the north and/or east were pronounced during the 12th and 13th centuries; conversely, relationships with Mississippian groups to the west were minimal. This situation appears to change at or around A.D. 1300 as cultural ties with Iroquoian groups increase and ceramic evidence of Mississippian influence is completely absent from the site. At the Moccasin Bluff site, the situation is different. Here, Mississippian influence is more fully expressed in the ceramic assemblage, beginning sometime around A.D. 1100 and continuing into the later Berrien Phase (ca. A.D. 1400-1600). During this time, grit and shell tempered ceramics attributable to Mississippian Oneota influences (i.e., Fisher and Huber wares) predominate and, notably, no ceramic evidence suggesting contact with Iroquoian-related groups is present at Moccasin Bluff.

The developmental trends observed at Dieffenderfer also appear to be documented at other Late Woodland sites in the middle St. Joseph valley. The ceramics from Kline 1, dated to the 13th century, suggest some form of Younge tradition and/or

Iroquoian influence. Although a cordmarked, shell tempered vessel was identified in the Kline 1 assemblage, the vast majority of the material is clearly Late Woodland as represented by grit tempered cordmarked sherds. A fabric impressed vessel from the site, likened by Quattrin (1988:63) to the Riviere ware type Springwells Net Impressed, resembles the fabric impressed material from Dieffenderfer in terms of surface treatment, temper, collaring, and rim profile. Additional evidence from Kline 1 suggestive of eastern influence includes a Younge tradition-type burial and a lithic assemblage containing exotic raw material from Ontario and the New York area, as well as material from northern Michigan (Cremin, Quattrin and Walz 1990:31, 35).

Ceramic material from the Whorley Earthwork site, located south of the main river channel on a tributary lake in southern Branch County, is also suggestive of some form of Iroquoian influence or contact. The three corded tool impressed vessels from the site display a similar rim profile and decorative motif and technique as those on Dieffenderfer Decorated variant corded tool impressed (Speth 1966: Plate II: C3-5). This site has been dated at A.D. 1080 \pm 100 (uncalibrated), clearly placing it and the ceramics in the Late Woodland period (Speth 1966:220). The lithic assemblage shows a predominance of Late Woodland Madison points. This site is also notable for the presence of an earthwork. Unlike Dieffenderfer, the earthwork at Whorley appears to have been palisaded, ceramic material was extremely light within its confines, and no evidence of features (i.e., house stutcures, refuse pits, etc.) were encountered during the period of limited excavation at the site. Speth (1966:227) contends that this earthwork was probably ceremonial in nature based on the above evidence. No further information regarding this site is currently available.

The significance of the Dieffenderfer site, as well as other sites in the middle St. Joseph valley, appears to be their intermediate position between those sites in the lower St. Joseph valley which exhibit closer ties to Oneota-related Upper Mississippian groups

(i.e., Fisher-Huber) occupying the Kankakee valley in northwestern Indiana and north-eastern Illinois and those sites located further to the north and east which demonstrate a closer relationship to Iroquoian-related groups in southern Ontario. The idea of the St. Joseph River as an east-west corridor of interaction uniquely positions the Dieffenderfer site at a pivotal location geographically. The site is located a short distance above the St. Joseph-Kankakee portage in northern Indiana, a major connecting route between these two river systems and is also situated immediately north of the river crossing of the historic Sauk trail at Mottville (presently US-12). Dieffenderfer may represent evidence of these routes during prehistory. Its location was no doubt a contributing factor to the variation which is apparent in the ceramics from the site.

A similar example has been documented at the Root site (20IN2), an early Late Woodland site located on the Grand River near the headwaters of the Grand, Shiawassee, and the Kalamazoo in southcentral Michigan (Holman and Kingsley 1996:367-368). The site lies within the territory typically occupied by Spring Creek peoples but ceramically is represented by material attributable to the northeastern Wayne tradition and the Allegan tradition; the site also evidences Mackinac ware and Hacklander ware (Brashler 1981:274). The variation in the ceramics suggests heavy social interaction and/or population movement at the site. Holman and Kingsley (1996:367) attribute the variation in the ceramics at Root to risk buffering, a concept originally conceived by Spielmann (1986).

The concept of risk buffering is based on the premise that groups may institute cooperative or competitive interaction to alleviate the effects of periodic, localized food shortages due to stress (Holman and Kingsley 1996:343-344). According to Spielmann (1986:280-281, 283) groups may counteract these shortages by exchanging with other groups or dispersing and exploiting the territory of another group. During the Late Woodland, Holman and Kingsley feel that the groups which occupied Michigan most

often chose the latter strategy by relying on their neighbors (Holman and Kingsley 1996:344). Spielmann (1996:282-285) suggests that risk buffering may be either cooperative or competitive in nature.

Cooperative buffering is characterized by the sharing of resources of one territory with groups experiencing shortages elsewhere (Holman and Kingsley 1996:344; Spielmann 1986:282-285). This form of buffering creates a "network of loosely coupled and undifferentiated systems" and may be "activated in times of stress" (Holman and Kingsley 1996:344-345). Additionally, it solidifies relationships between groups that ultimately may be used in the future during shortages of resources. Such territories may infringe on adjacent resource areas at the periphery (Williams 1968:129) and there may be "neutral zones" which can be used by all groups at the same time (Pilling 1968:155). Alternatively, if these networks are not in place or cooperative effort fails, competition may be invoked (Spielmann 1986:283-284).

Risk buffering is evidenced archaeologically at sites in Michigan during the Late Woodland period (Holman and Kingsley 1996:350). This includes the presence of foreign artifacts, foreign components, or a combination of foreign artifacts and components at sites. Foreign artifacts includes both lithic and ceramic material found outside its normal geographic range in relatively culturally homogenous local components; these typically represent accidental meeting, a visit with kin, or exchange (Holman and Kingsley 1996:351). These forms of interaction typically involve interaction across social boundaries and may function as a means of solidifying ties between ethnic groups. Foreign components include the presence of a complete assemblage of artifacts at site and are representative of the "intrusion of a whole system or partial system" as opposed to an isolated find. Typically, these may represent the movement of a group into another group's territory or into a neutral zone, or they may be indicative of population dispersal and cooperative or competitive risk buffering efforts (Holman and Kingsley 1996:351).

When combined, foreign artifacts and components may occur together with local components (Holman and Kingsley 1996:351).

The relationship between Late Woodland sites in the lower St. Joseph valley, such as Moccasin Bluff, and those sites located in the middle valley, such as Dieffenderfer, Kline 1 and Whorley Earthwork, remains poorly understood. Analysis of the Dieffenderfer assemblage suggests those ceramics being produced (or exchanged) in the middle valley during the Late Woodland period were dramatically different from those sites in the lower valley. The evidence of similar material at Kline 1 and Whorley suggests this material was not limited to one site, but was more widespread. A similar process has been documented in the lower Kalamazoo with the infusion of Hacklander ware, which Kingsley (1989) suggests is the result of an influx of a culturally distinct ethnic group. The results of this analysis suggest that the Dieffenderfer material is representative of a new ware and, by extension, possibly was produced by an unknown cultural tradition which occupied the middle valley region during the Late Woodland. The Dieffenderfer site locality may be an example of a site in a "tension zone" or transition zone between two separate cultural traditions.

The permeability of this cultural boundary, so to speak, appears to have fluctuated at various times in the past. This is evident in the comparison of the ceramics from the two house areas at the site. Material attributable to Moccasin Bluff ware, Fisher ware and the Powell Plain-like vessel, indicative of contact with groups located to the south and west, are all present within the area surrounding the Zone A housefloor, which dates around A.D. 1200. Interestingly, such material is virtually non-existent in the later Zone B occupation, dating after A.D. 1300. This suggests that the boundary between east and west was somewhat permeable during the early 13th century than during the 14th century.

The virtual absence of Mississippian-related ceramics and an increase in Iroquoian-related material at Dieffenderfer around A.D. 1300 suggests relationships with Missis-

Mississippian groups were declining while ties with Iroquoian peoples were increasing gradually over time. It is interesting that while evidence of contact with Late Woodland groups at Moccasin Bluff (or a related site) is evident in the Dieffenderfer ceramic assemblage no evidence of Iroquoian influence is apparent in the assemblage from Moccasin Bluff. Perhaps some form of competitive interaction or buffering was occurring between Mississippian-related peoples in the lower valley and Iroquoian-related groups in the middle drainage. While currently lacking evidence of fortification, the ditch enclosure at Dieffenderfer may be evidence of conflict or hostility in this region. The exact nature of this competition, if indeed it existed, remains to be explained. The availability of prime alluvial soils in the valley and an increasing reliance on maize agriculture may have been contributing factors to such competition. This competition could have been fostered by the influx of Upper Mississippian peoples into the lower valley at or around A.D. 1100 and somewhat later in the lower Kalamazoo.

The interpretations presented in this section can only be confirmed or rejected after analyses of large ceramic data sets from sites located throughout the lower and middle segments of the St. Joseph River valley are completed and the results compared to one another. A better understanding of those ceramics being produced throughout the St. Joseph valley will be helpful in clarifying the relationship between those groups occupying the region. The definition of Dieffenderfer ware provided here contributes to this understanding. Only a few sites in the middle valley have been located which suggest this ware exists. A larger, more comparable ceramic data set is needed from sites in the middle drainage to further substantiate its existence.

In addition to testing sites in the middle drainage area, future clarification of the Late Woodland in northcentral Indiana is needed to further delineate cultural relationships between groups in this region and those along the St. Joseph. There exists some form of relationship between these two regions that currently is in need of better

understanding. The Late Woodland in northcentral Indiana, much like the middle St. Joseph, remains poorly understood. Perhaps those groups occupying the middle valley during the Late Woodland were participating in the same cultural tradition as those groups residing in areas immediately south. Or alternatively, perhaps sites in the middle valley, like Root in southcentral Michigan, were located in an area of transition between two ethnically different cultures. The analysis presented here should serve as a foundation from which future research can proceed to address the Late Woodland cultural dynamics in the St. Joseph River valley.

Appendix A
Dieffenderfer Site Features

Table 1
Dieffenderfer Site Features

Feature No.	Provenience (Test Unit)	Proposed Function
1	1, 2, 13, 28, 29, 47, 52, 55, 60, 64, 87, 89, 112, 120	Ditch
2	12	Postmold
3	32	Pit (Indet.)
4	53	Housefloor
4-A	53	Hearth/Firepit
4-B	53	Pit (Indet.)
4 (p1-p4)	53	Postmolds
5	35	Pit (Indet.)
6	70, 71	FCR Conc.
7	68	Hearth/Firepit
8	91, 92	Pit (Indet.)
9	68	Storage Pit
10	100	Midden/Refuse Pit
11	77, 88, 100	Pit (Indet.)
12	104	Storage Pit
13	100	Midden/Refuse Pit (Clam)
14	102, 104, 113	Pit (Indet.)
15	n/a	Historic Campfire
16	68, 107, 115, 116, 118	Housefloor
16-A (p1-p16)	107, 115, 116, 118, 124	Postmolds
16-B	107	Hearth/Firepit
16-C	107	Ceramic Conc.
17	111	Pit (Indet.)
18	56, 58	Pit (Indet.)

Appendix B

Dieffenderfer Site Ceramics

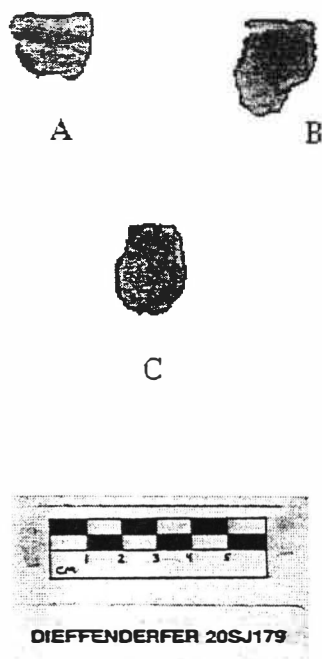
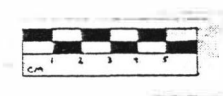
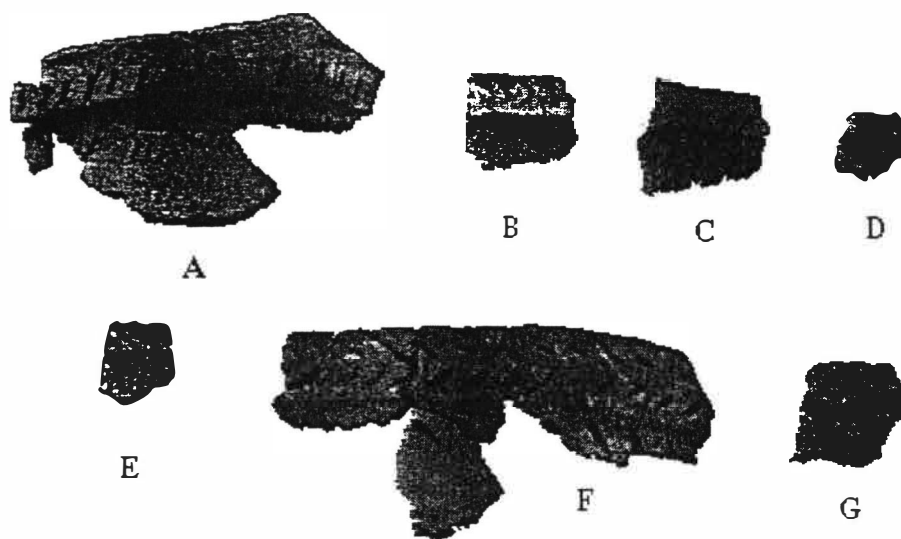


Figure 8. Middle Woodland Ceramics from Dieffenderfer.
A: Sumnerville Ware, Rocker Stamped Variety. B: Sumnerville Ware,
Plain/Undecorated Variety. C: Hopewell Ware, Brangenburg Plain.



DIEFFENDERFER 20SJ179

Figure 9. Dieffenderfer Ware Ceramics from Dieffenderfer.
A-G: Dieffenderfer Decorated. Variant Corded Tool Impressed.

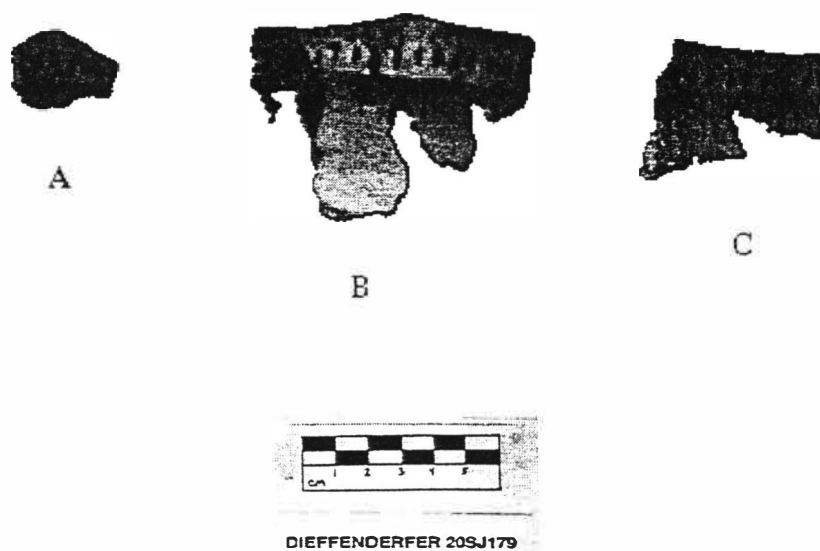


Figure 10. Dieffenderfer Ware Ceramics from Dieffenderfer.
A-C: Dieffenderfer Decorated, Variant Corded Tool Punctate.

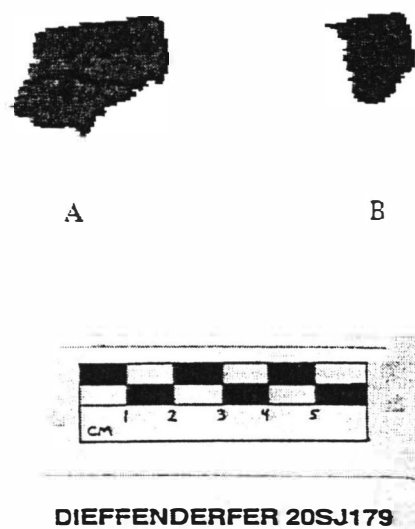
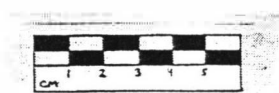


Figure 11. Dieffenderfer Ware Ceramics from Dieffenderfer.
A-B: Dieffenderfer Decorated, Variant Push-Pull.



DIEFFENDERFER 20SJ179

Figure 12. Dieffenderfer Ware Ceramics from Dieffenderfer.
A: Dieffenderfer Decorated, Variant Incised.

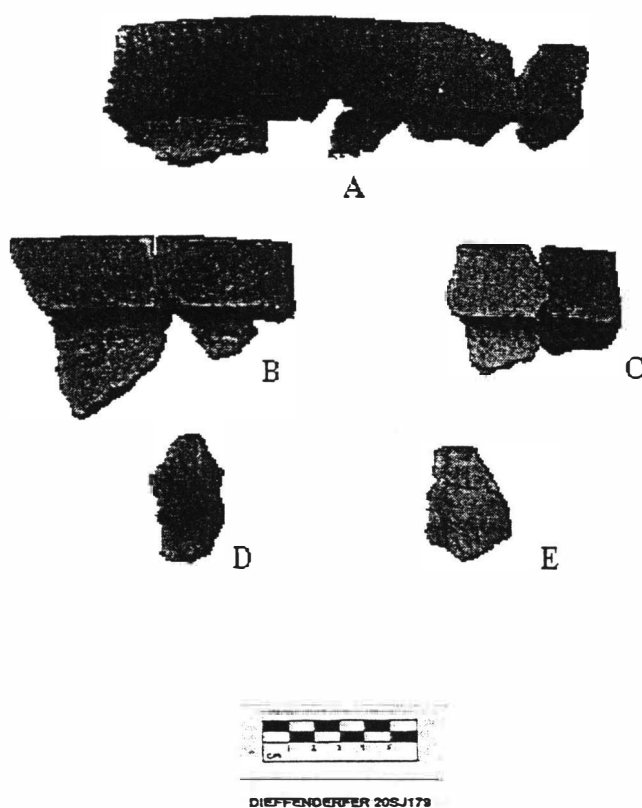


Figure 13. Dieffenderfer Ware Ceramics from Dieffenderfer.

A-E: Dieffenderfer Undecorated, Variant Smoothed Over Cordmarked.

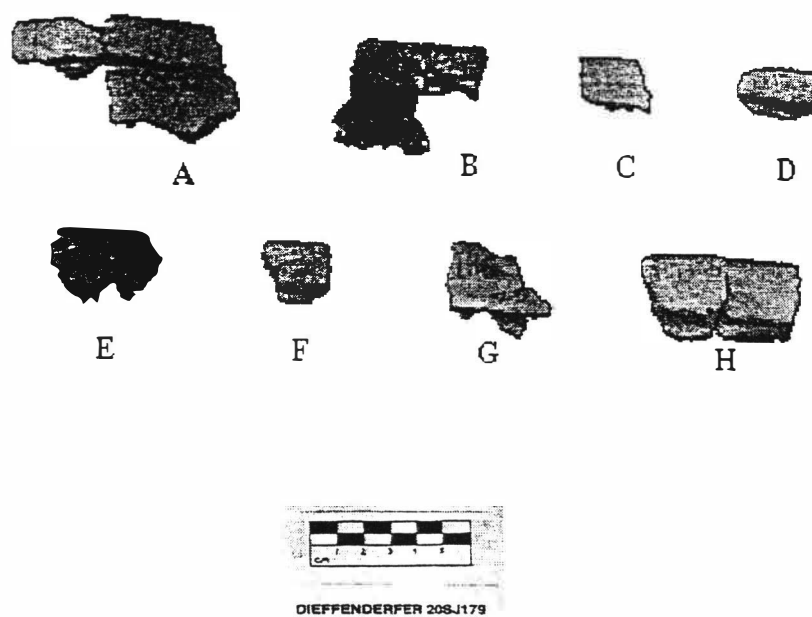


Figure 14. Dieffenderfer Ware Ceramics from Dieffenderfer.

A-H: Dieffenderfer Undecorated, Variant Smoothed Over Cordmarked.

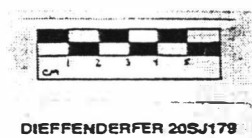
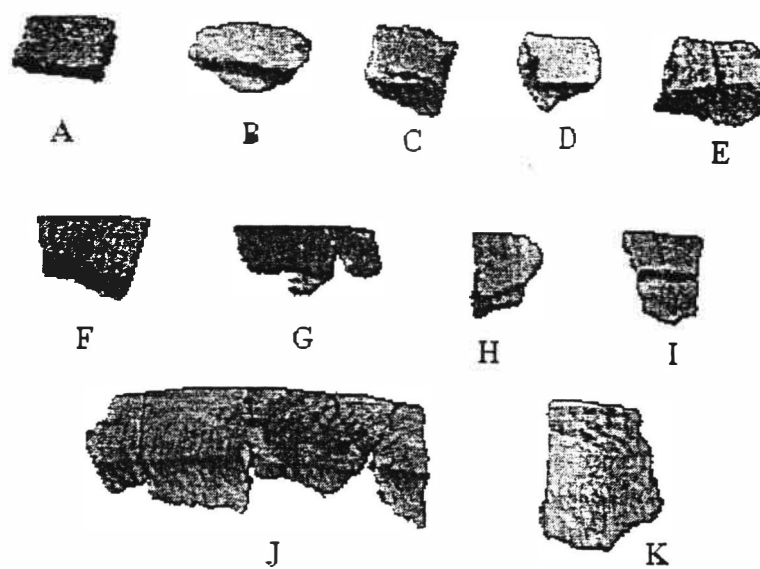


Figure 15. Dieffenderfer Ware Ceramics from Dieffenderfer.
A-K: Dieffenderfer Undecorated, Variant Cordmarked.

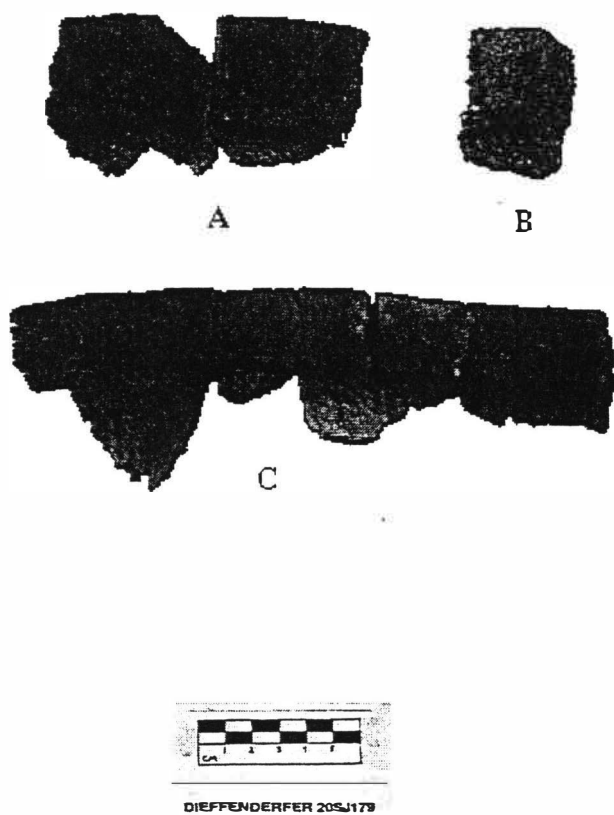


Figure 16. Dieffenderfer Ware Ceramics from Dieffenderfer.
A-C: Dieffenderfer Undecorated, Variant Fabric Impressed.



A



Figure 17. Dieffenderfer Ware Ceramics from Dieffenderfer.
A: Dieffenderfer Undecorated, Variant Plain.

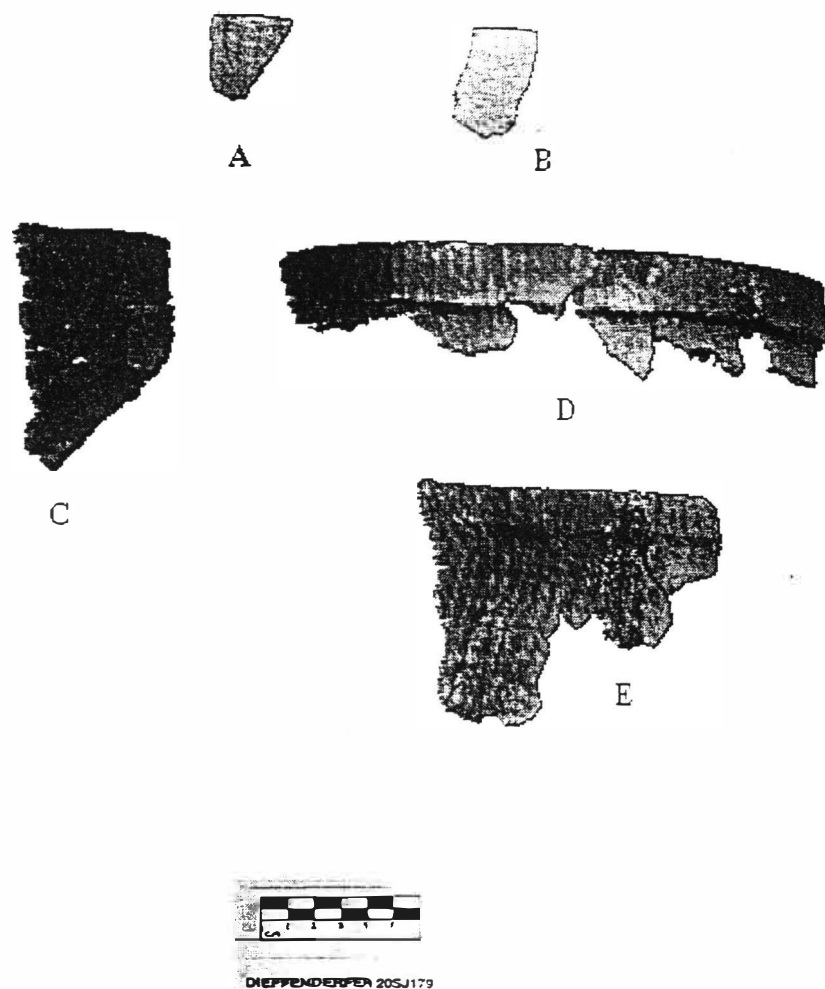


Figure 18. Allean Ware Ceramics from Dieffenderfer.
A-B: Allean Undecorated, Variant Undecorated Lip. C-E: Allean Undecorated, Variant Undecorated Lip/Collared.

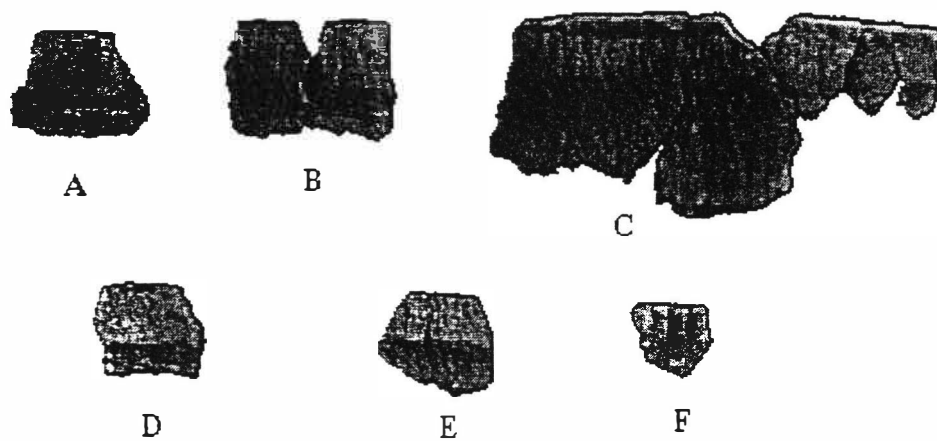


Figure 19. Moccasin Bluff Ware Ceramics from Dieffenderfer.
A-E: Moccasin Bluff Collared (Decorated). F: Moccasin Bluff Impressed
Exterior Lip.

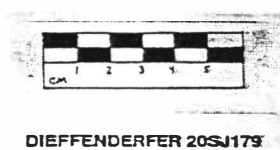
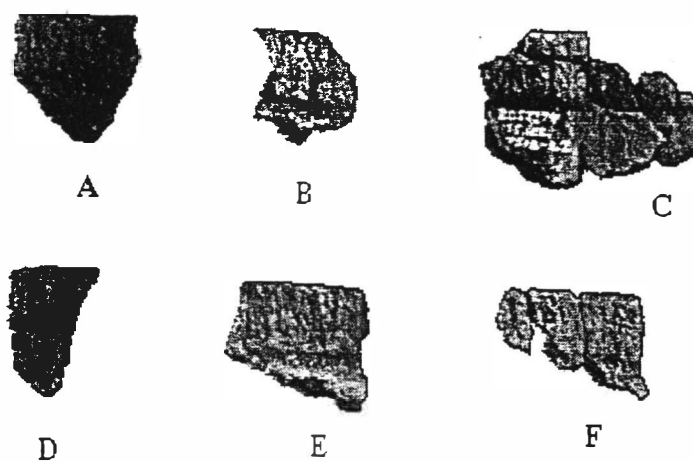


Figure 20. Moccasin Bluff Ware Ceramics from Dieffenderfer.
A-F: Moccasin Bluff Collared (Undecorated).

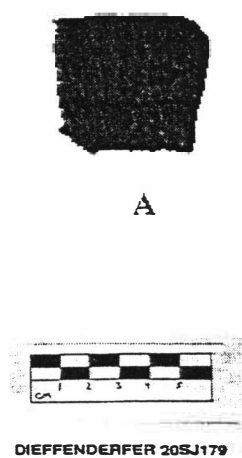


Figure 21. Spring Creek Ware Ceramics from Dieffenderfer.
A: Spring Creek Undecorated, Variant Undecorated Lip/Collared.

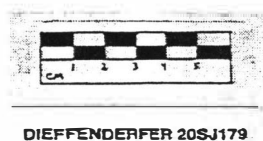
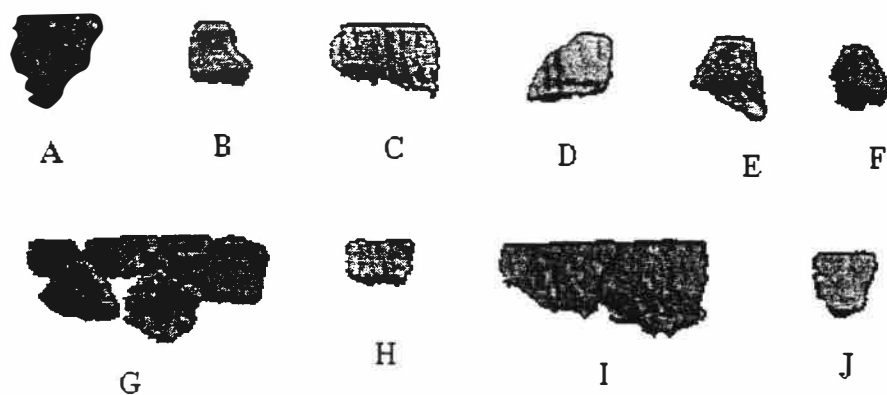


Figure 22. Unclassified Late Woodland Ceramics from Dieffenderfer.
A-J: Collared.

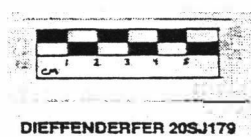
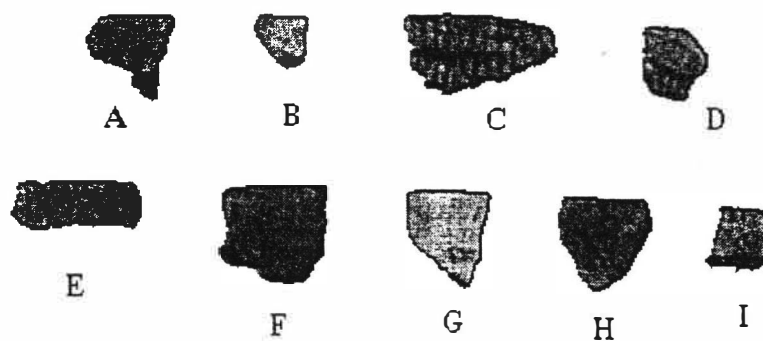


Figure 23. Unclassified Late Woodland Ceramics from Dieffenderfer.
A-G, I: Collared. H: Uncollared.

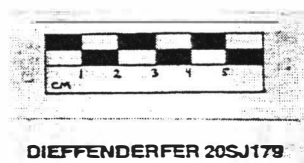
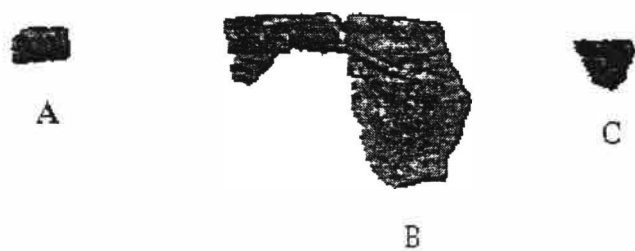


Figure 24. Mississippian Ceramics from Dieffenderfer.
A: Powell Plain. B: Fisher Trailed. C: Fisher Cordmarked.

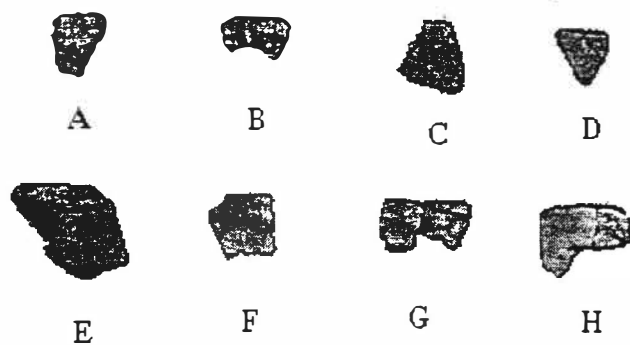


Figure 25. Miscellaneous Unclassified Ceramics from Dieffenderfer.
A-H: Miniature Vessels.

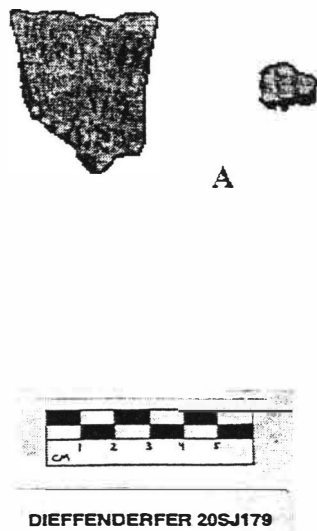


Figure 26. Miscellaneous Unclassified Ceramics from Dieffenderfer.
A: Limestone Tempered, Cordmarked Vessel.

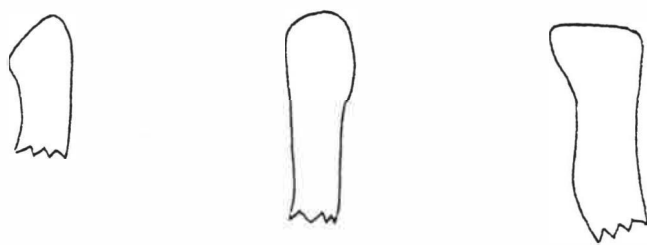


Figure 27. Middle Woodland Ceramic Profiles from Dieffenderfer. Profiles Correspond to Vessels in Figure 8, Exteriors to the Left.

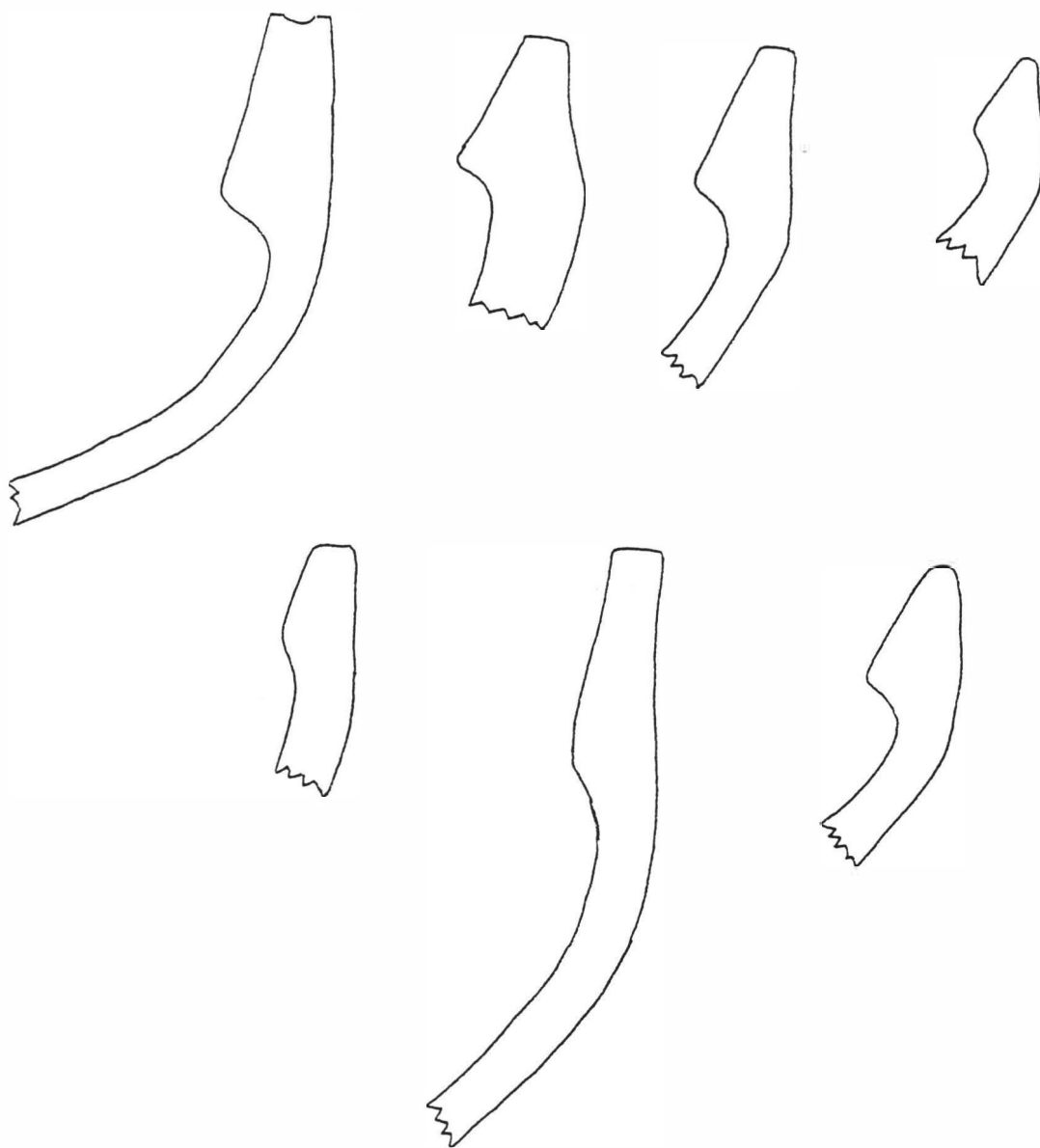


Figure 28. Dieffenderfer Ware Ceramic Profiles from Dieffenderfer. Profiles Correspond to Vessels in Figure 9, Exteriors to the Left.

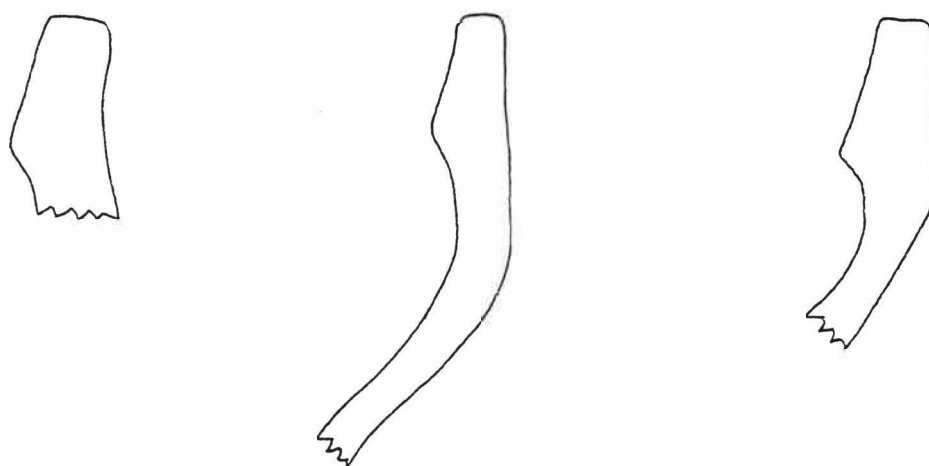


Figure 29. Dieffenderfer Ware Ceramic Profiles from Dieffenderfer. Profiles Correspond to Vessels in Figure 10, Exteriors to the Left.



Figure 30. Dieffenderfer Ware Ceramic Profiles from Dieffenderfer. Profiles Correspond to Vessels in Figure 11, Exteriors to the Left.

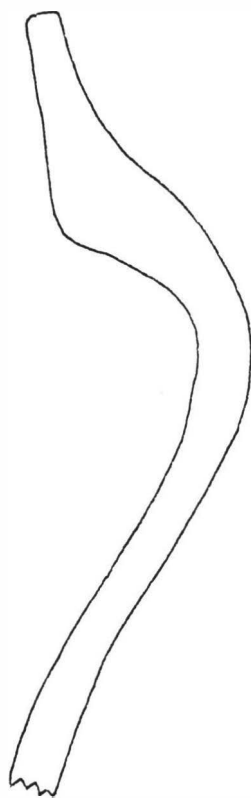


Figure 31. Dieffenderfer Ware Ceramic Profiles from Dieffenderfer. Profiles Correspond to Vessels in Figure 12, Exteriors to the Left.

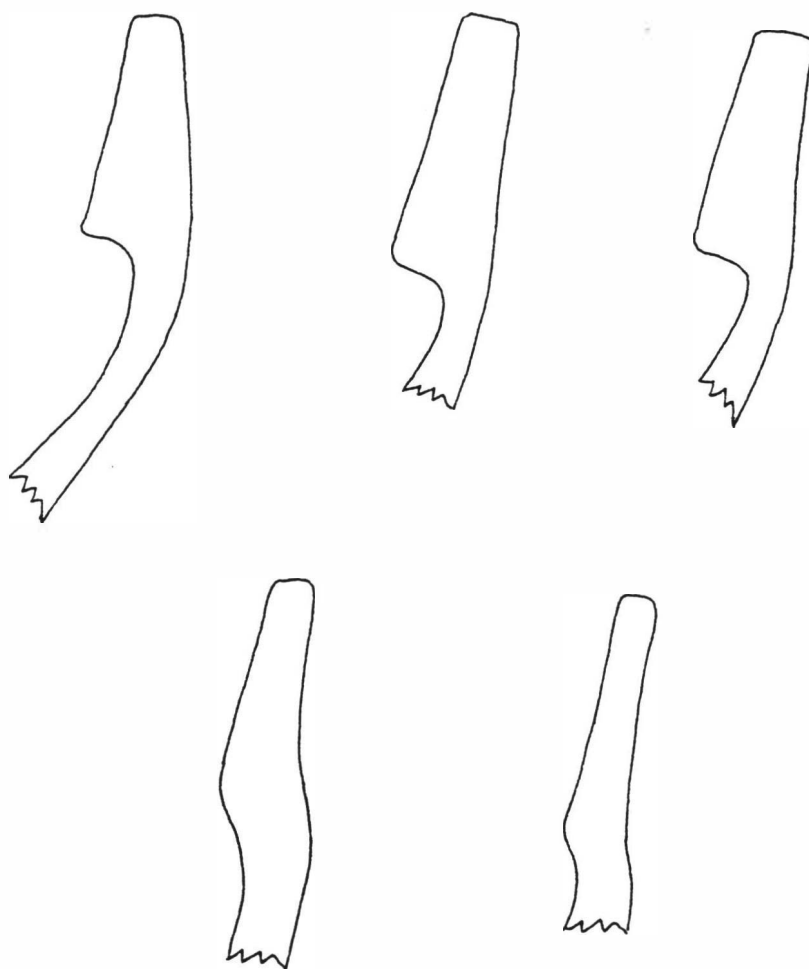


Figure 32. Dieffenderfer Ware Ceramic Profiles from Dieffenderfer. Profiles Correspond to Vessels in Figure 13, Exteriors to the Left.

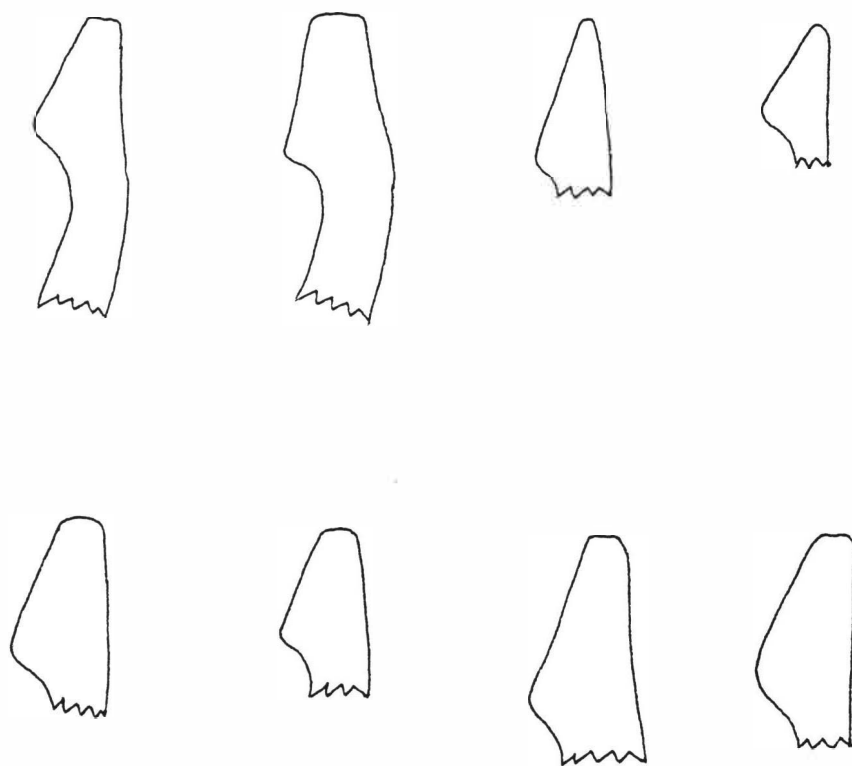


Figure 33. Dieffenderfer Ware Ceramic Profiles from Dieffenderfer. Profiles Correspond to Vessels in Figure 14, Exteriors to the Left.

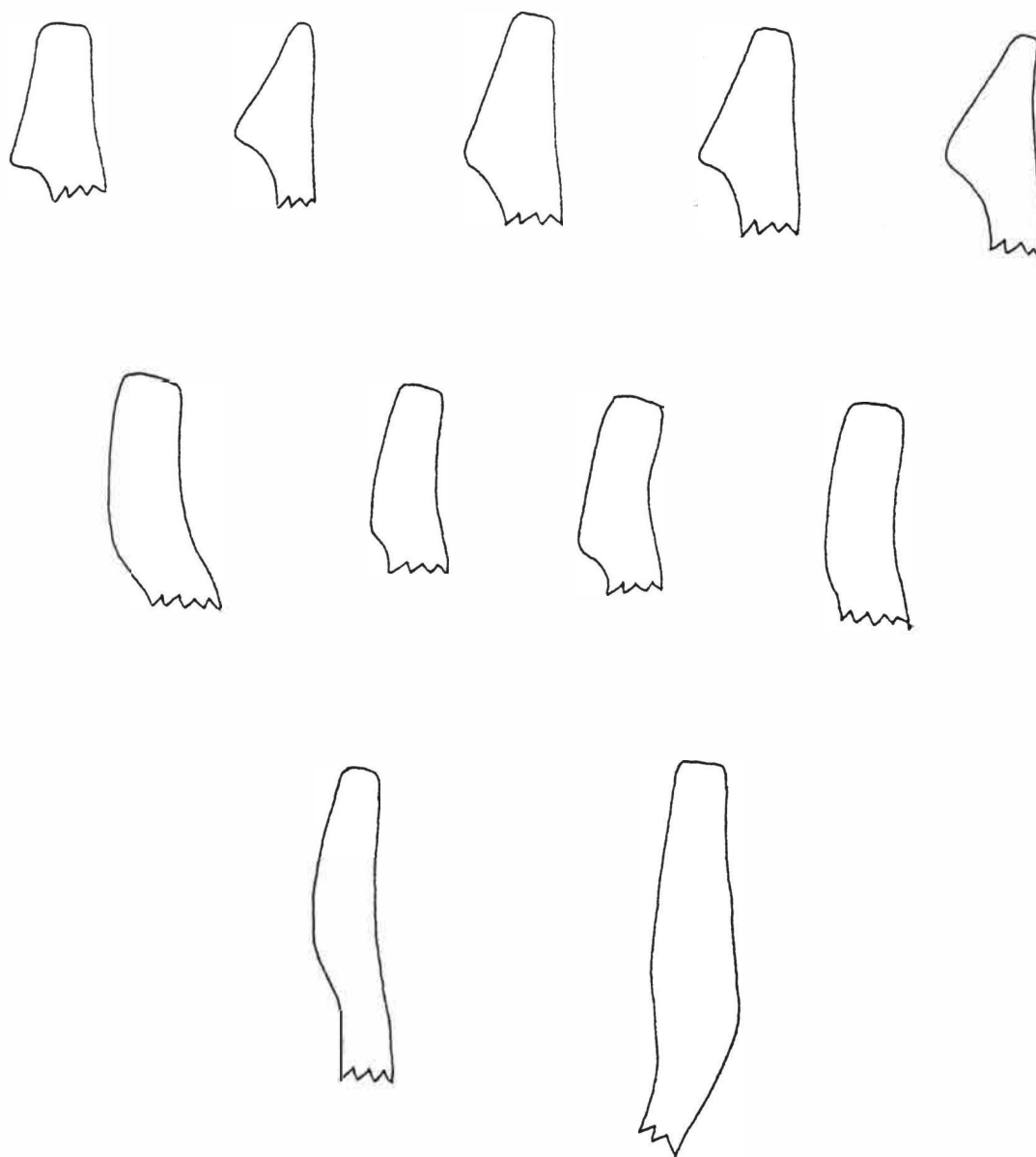


Figure 34. Dieffenderfer Ware Ceramic Profiles from Dieffenderfer. Profiles Correspond to Vessels in Figure 15, Exteriors to the Left.

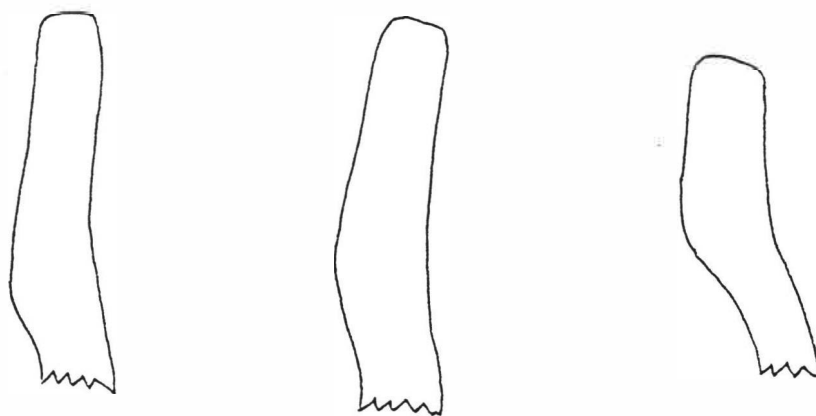


Figure 35. Dieffenderfer Ware Ceramic Profiles from Dieffenderfer. Profiles Correspond to Vessels in Figure 16, Exteriors to the Left.



Figure 36. Dieffenderfer Ware Ceramic Profile from Dieffenderfer. Profile Corresponds to Vessel in Figure 17, Exterior to the Left.

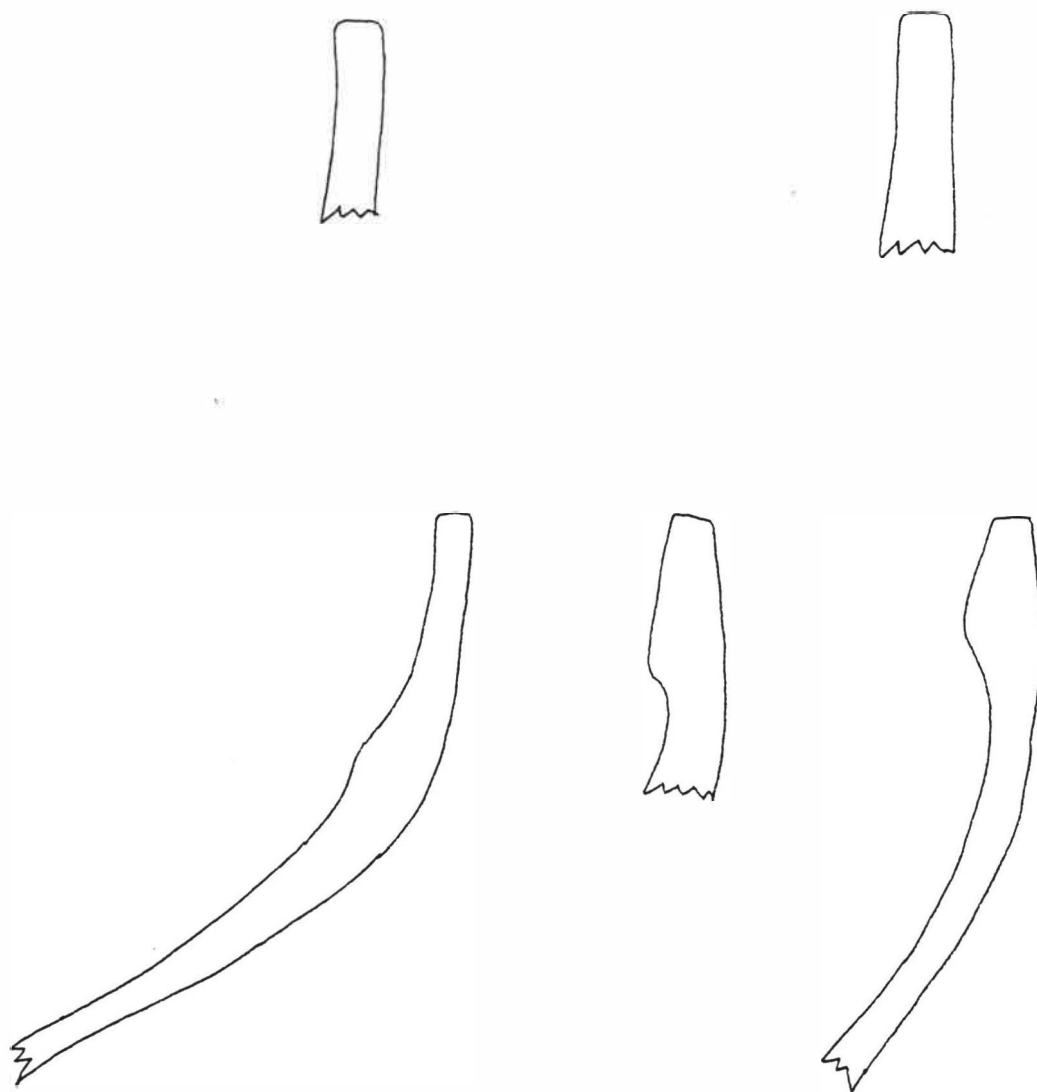


Figure 37. Allegan Ware Ceramic Profiles from Dieffenderfer. Profiles Correspond to Vessels in Figure 18, Exteriors to the Left.

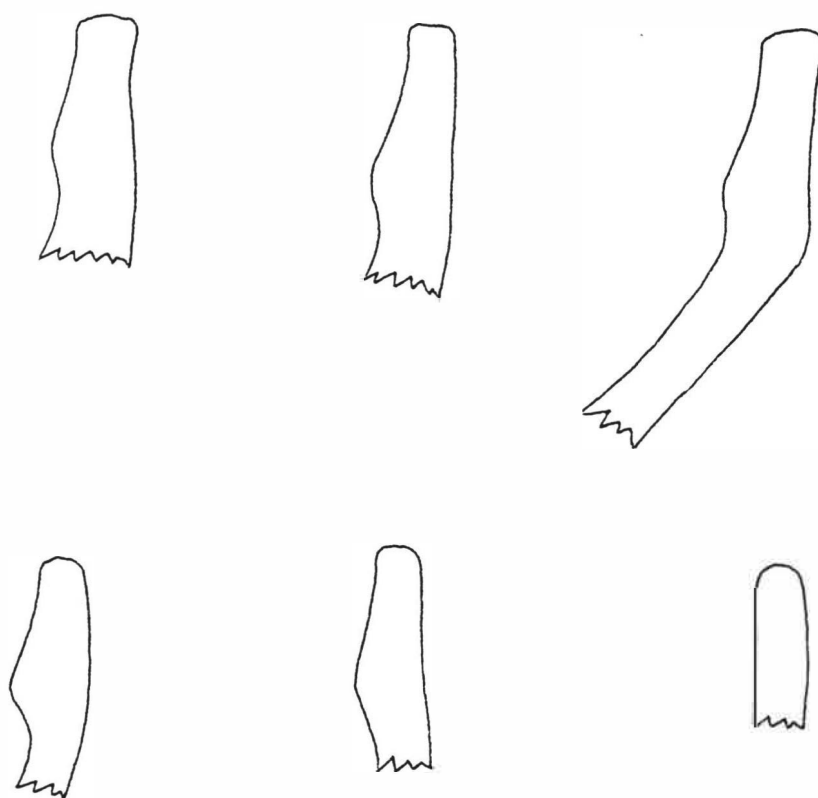


Figure 38. Moccasin Bluff Ware Ceramic Profiles from Dieffenderfer. Profiles Correspond to Vessels in Figure 19, Exteriors to the Left.

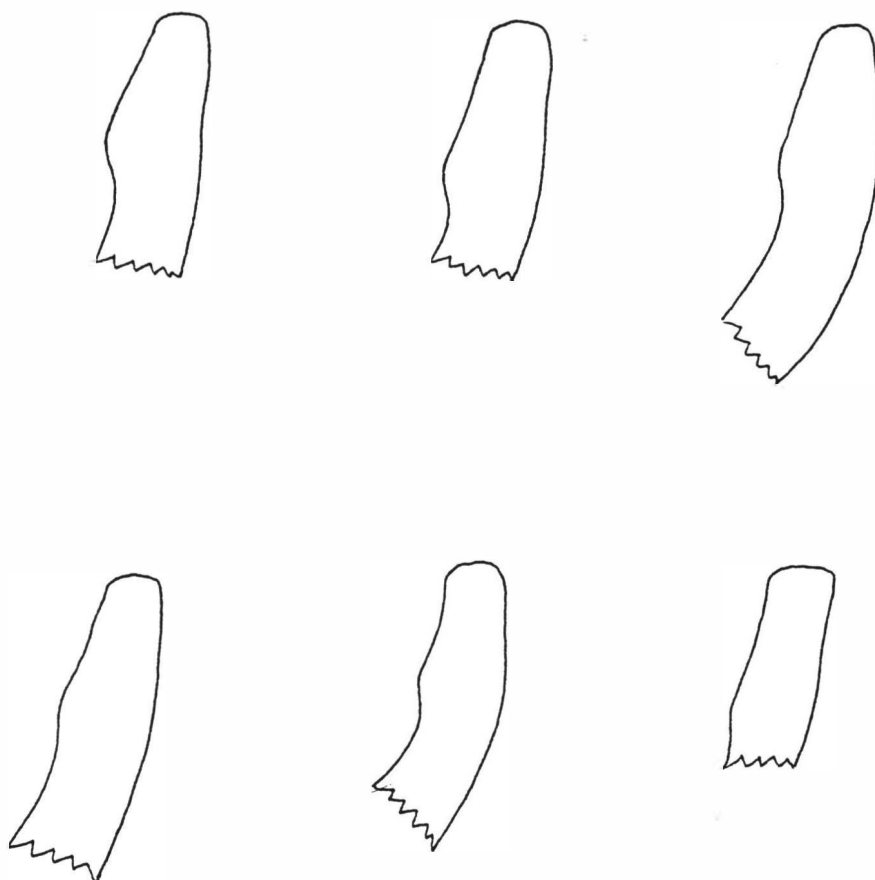


Figure 39. Moccasin Bluff Ware Ceramic Profiles from Dieffenderfer. Profiles Correspond to Vessels in Figure 20, Exteriors to the Left.



Figure 40. Spring Creek Ware Ceramic Profile from Dieffenderfer. Profile Corresponds to Vessel in Figure 21, Exterior to the Left.

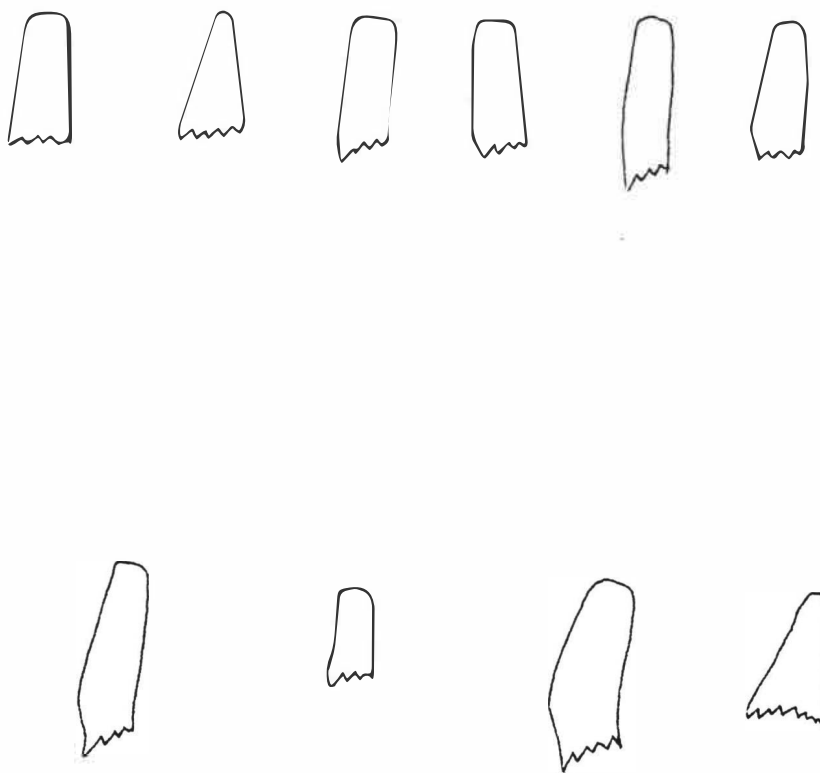


Figure 41. Unclassified Late Woodland Ceramic Profiles from Dieffenderfer. Profiles Correspond to Vessels in Figure 22, Exteriors to the Left.

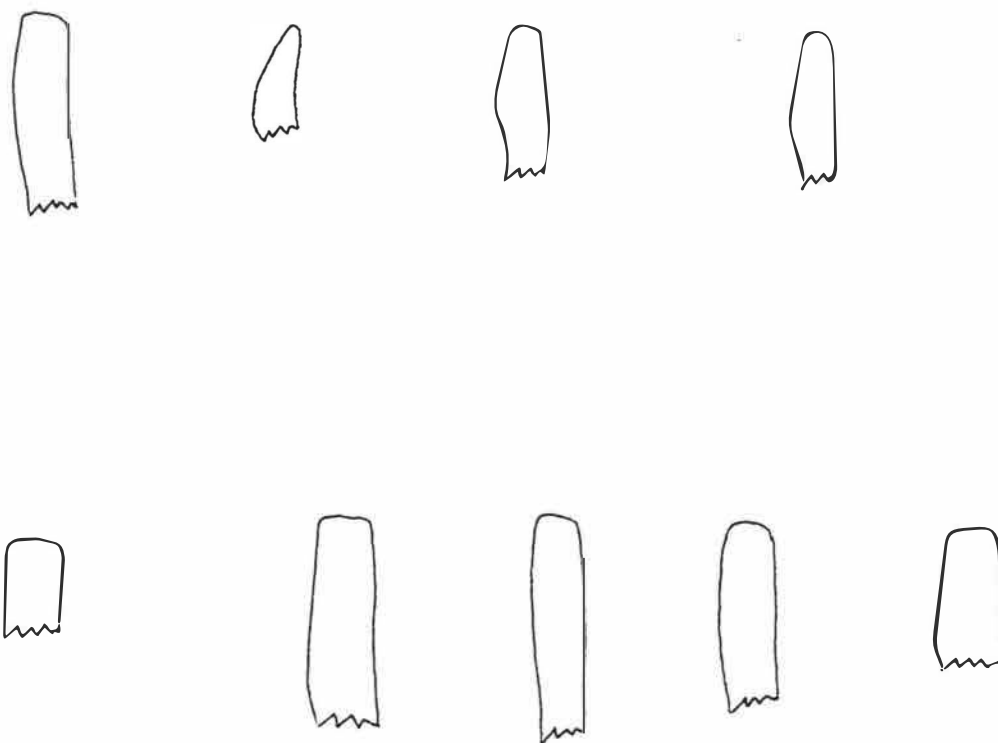


Figure 42. Unclassified Late Woodland Ceramic Profiles from Dieffenderfer. Profiles Correspond to Vessels in Figure 23, Exteriors to the Left.



Figure 43. Mississippian/Upper Mississippian Ceramic Profiles from Dieffenderfer. Profiles Correspond to Vessels in Figure 24, Exteriors to the Left.

Appendix C

Distribution of Body Sherds

Table 2

Zone A: Body Sherd Surface Treatment Distribution by Level

	Cdmk	Smth Cdmk	Smth	Fab Imp	Plain	Indet	Totals
L-I	56	151	30	14	6	234	491
(%)	11.4	30.8	6.1	2.9	1.2	47.6	100.0
L-II	58	87	17	17	10	208	397
(%)	14.6	21.9	4.3	4.3	2.5	52.4	100.0
L-III	71	37	24	4	17	189	342
(%)	20.8	10.8	7.0	1.2	4.9	55.3	100.0
L-IV	13	9	1	15	0	40	78
(%)	16.7	11.5	1.3	19.2	0.0	51.3	100.0
Totals	198	234	62	50	33	568	1308
(%)	15.1	21.7	5.5	3.8	2.5	51.3	100.0

Table 3

Zone A: Body Sherd Surface Treatment Distribution by Feature

	Cdmk	Smth Cdmk	Smth	Fab Imp	Plain	Indet	Totals
F-4	131	203	38	19	6	300	697
(%)	18.8	29.1	5.5	2.7	0.9	43.0	100.0
F-4-A	89	126	21	0	3	307	546
(%)	16.3	23.1	3.8	0.0	0.6	56.2	100.0
F-4-B	147	54	10	3	0	98	312
(%)	47.1	17.3	3.2	1.0	0.0	31.4	100.0
Totals	367	383	69	22	9	705	1555
(%)	23.6	24.6	4.4	1.4	0.6	45.3	100.0

Table 4

Zone B: Body Sherd Surface Treatment Distribution by Level

	Cdmk	Smth Cdmk	Smth	Fab Imp	Plain	Indet	Totals
L-I	166	311	113	131	22	441	1184
(%)	14.0	26.3	9.5	11.1	1.9	37.2	100.0
L-II	313	196	38	101	24	574	1246
(%)	25.1	15.7	3.1	8.1	1.9	46.1	100.0
L-III	29	25	8	13	8	30	113
(%)	25.7	22.1	7.1	11.5	7.1	26.5	100.0
L-IV	3	14	0	0	4	8	29
(%)	10.3	48.3	0.0	0.0	13.8	27.6	100.0
L-V	1	8	0	0	6	2	17
(%)	5.9	47.1	0.0	0.0	35.3	11.7	100.0
L-VI	2	6	0	0	6	3	17
(%)	11.7	35.3	0.0	0.0	35.3	17.7	100.0
Totals	514	560	159	245	70	1058	2606
(%)	19.7	21.5	6.1	9.4	2.7	40.6	100.0

Table 5

Zone B: Body Sherd Surface Treatment Distribution by Feature

	Cdmk	Smth Cdmk	Smth	Fab Imp	Plain	Indet	Totals
F-7	0	3	2	7	0	3	15
(%)	0.0	20.0	13.3	46.7	0.0	20.0	100.0
F-8	1	3	0	0	0	0	4
(%)	25.0	75.0	0.0	0.0	0.0	0.0	100.0
F-9	3	5	11	39	0	29	87
(%)	3.5	5.8	12.6	44.8	0.0	33.3	100.0
F-12	1	0	1	0	0	0	2
(%)	50.0	0.0	50.0	0.0	0.0	0.0	100.0
F-14	2	1	0	0	1	2	6
(%)	33.3	16.7	0.0	0.0	16.7	33.3	100.0
F-16-B	0	4	2	0	0	1	7
(%)	0.0	57.1	28.6	0.0	0.0	14.3	100.0
Totals	7	16	16	46	1	35	121
(%)	5.8	13.2	13.2	38.0	0.8	29.0	100.0

Table 6

Zone C: Body Sherd Surface Treatment Distribution by Level

	Cdmk	Smth Cdmk	Smth	Fab Imp	Plain	Indet	Totals
L-I	3	11	1	0	0	1	16
(%)	18.8	68.8	6.2	0.0	0.0	6.2	100.0
L-II	19	41	1	2	3	20	86
(%)	22.1	47.7	1.2	2.3	3.5	23.2	100.0
L-III	6	27	0	0	1	1	35
(%)	17.1	77.1	0.0	0.0	2.9	2.9	100.0
Totals	28	79	2	2	4	22	137
(%)	20.4	57.7	1.5	1.5	2.9	16.0	100.0

Table 7

Zone C: Body Sherd Surface Treatment Distribution by Feature

	Cdmk	Smth Cdmk	Smth	Fab Imp	Plain	Indet	Totals
F-10	40	319	15	14		3	476
(%)	8.4	67.0	3.2	2.9		0.6	100.0
F-13	1	16	1	12		0	32
(%)	3.1	50.0	3.1	37.5		0.0	100.0
F-17	0	77	0	4		2	109
(%)	0.0	70.6	0.0	3.7		1.8	100.0
Totals	41	412	16	30		5	617
(%)	6.6	66.8	2.6	4.9		0.8	100.0

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