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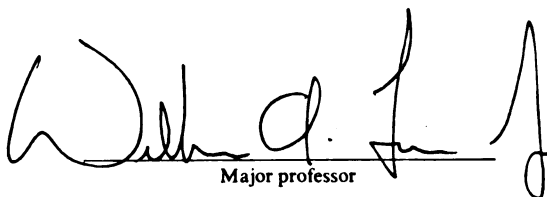
The Skegemog Point Site: Continuing Studies in
the Cultural Dynamics of the Carolinian-Canadian
Transition Zone

presented by

Michael Jay Hambacher

has been accepted towards fulfillment
of the requirements for

Ph. D. degree in Anthropology



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**THE SKEGEMOG POINT SITE: CONTINUING STUDIES IN THE CULTURAL
DYNAMICS OF THE CAROLINIAN-CANADIAN TRANSITION ZONE**

Volume I

By

Michael Jay Hambacher

A DISSERTATION

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ABSTRACT

THE SKEGEMOG POINT SITE: CONTINUING STUDIES IN THE CULTURAL DYNAMICS OF THE CAROLINIAN-CANADIAN TRANSITION ZONE

By

Michael Jay Hambacher

For the last thirty years, the interrelationship between the environment and cultural adaptations in the Upper Great Lakes has operated as a central orienting principle in the study of Late Woodland period cultural dynamics. Building on previous research, this study uses collections from the Skegemog Point site, Grand Traverse County, Michigan, as a focus for the examination of cultural boundaries within the Carolinian-Canadian transition zone.

First, cluster analysis is used to confirm and update the original intuitively based ceramic classification from the Skegemog Point site. This information is integrated with the spatial distribution of ceramics, lithics, and features at the site to gain a fuller understanding of the nature of the cultural adaptations in the region during the Late Woodland period. Factor analysis successfully separates the different components at the site and indicates that the site functioned as both a logistic and residential locale during this period.

The results from the first stage of analysis are then used as a reference point for the examination of ceramic stylistic similarities and differences among a series of sites located south of Grand Traverse Bay in the main body of the Carolinian-Canadian transition zone. Cluster analysis revealed the presence and changing nature of at least one cultural boundary within the region. Clear stylistic differences were identified between the Skegemog Point site and the region to the south during the early phase of the Late Woodland period. The expression of this stylistic boundary is less clear

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indicating the presence of a single style pool within the region in the succeeding phase of the Late Woodland period. These results indicate that distinct cultural adaptations to the unique environmental configuration of the Carolinian-Canadian transition zone are in place by the beginning of the Late Woodland period.

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Dedicated to Dr. William O. Hambacher and Dorothy J. Hambacher.

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CHAPTER 1

INTRODUCTION

INTRODUCTION

The influence of the environment on the distribution of cultures in the Upper Great Lakes and the nature of their adaptive strategies has long been recognized (Cleland 1966a; Fitting 1975; Griffin 1960; Hinsdale 1925, 1928a, 1932; Hubbard 1887; Mason 1981; Mueller 1980; Yarnell 1964). Initially, most of the archaeological research conducted in the region was descriptive in nature, lacking explanatory power. With the emergence of an evolutionary perspective in American archaeology in the post-war era and the focus on cultural processes and adaptation associated with the New Archaeology (Harris 1968; Willey and Sabloff 1974), explorations into the nature of the interaction between culture and the environment became more formalized and systematic. Interwoven in this ecologically based perspective are questions pertaining to the structure of prehistoric societies and the nature of the interactions and boundaries between them.

The transitional position of Michigan between the southern oak-hickory forests and the more northern coniferous forests in conjunction with its unique physiographic configuration affords an exceptional opportunity to examine the interplay between cultural processes and the environment. Formal explorations of the cultural adaptations to the post-Pleistocene environment in the state was initiated thirty years ago in the Saginaw Valley by the University of Michigan (Griffin 1960). Building on this research, Cleland (1966a) and Fitting (1966a) formally adopted the ecological concept of ecotones or transition zones between biotic provinces as an integrative device and

applied it to archaeological and ethnohistoric data. Although it was apparent that the historic and prehistoric inhabitants of Michigan were broadly adapted to the region's major biotic provinces (Cleland 1966a; Fitting 1966a; Quimby 1960; Yarnell 1964), the nature of the interactions between these two cultural traditions and the use of the intervening ecological transition zone were poorly understood.

Since the appearance of the first edge area reports (e.g., Cleland 1966b, 1967a, 1967b; Fitting 1966a; Fitting et al. 1968; Flanders 1965) a wide variety of archaeological and ethnographic data has been employed to investigate the patterns and processes of cultural adaptation across the region. Examples include the distribution of cultural groups at the time of European contact (Fitting and Cleland 1969), the exchange of raw materials and finished artifacts (Luedtke 1976), site locational and resource availability data (Holman 1978), and the distribution of ceramic decorative styles through time and space (Brashler 1981; Lovis 1973). Ironically, although the nature of the adaptations to the Carolinian-Canadian transition zone was a central question of the initial edge area studies, large portions of that region, specifically the western half, received only cursory examination.

After the completion of large scale excavations at the Skegemog Point site, the focus of research in northern Michigan shifted to the Traverse Corridor and Inland Waterway regions (Cleland 1967a, 1967b; Holman 1978; Lovis 1973, 1978a; Lovis and Cleland 1979). In southern Michigan, much of the research carried out under the aegis of the edge area project focused on sites located in the Carolinian biotic province (Fitting 1966a; Fitting et al. 1968; Flanders 1965). Work in the west central portion of the state was restricted to the examination of the Middle Woodland period in the central Muskegon Valley (Prah 1970, 1991) and a survey of the central Manistee Valley (Brunett 1966).

Following the inspiration of the early edge area studies, this study continues the exploration of the cultural dynamics in the Carolinian-Canadian transition

zone. Specifically, this research focuses on the western portions of the transition zone during the Late Woodland period. The distribution of ceramic decorative styles is used as the primary means to gauge the nature of the cultural adaptations and patterns of interaction within the study area. Several factors make such an investigation warranted at this time. First, as noted above, the cultural dynamics of this region remain poorly understood. Secondly, a number of additional Late Woodland ceramic assemblages have come to light since the original edge surveys were conducted. Lastly, the Skegemog Point site, located near the southern end of Grand Traverse Bay, has become available for re-examination. This site, with its extensive excavations and large Late Woodland ceramic assemblage, provides a critical analytic reference point for this study.

The remainder of this chapter will accomplish several goals. First, the physical and temporal parameters of the study area are defined. Secondly, previous research conducted within the study area is summarized. This provides a context for further discussion of the research problems examined in this document. Finally, the physiographic and ecological parameters of the study area are described. This provides a basis for evaluating linkages between the observed patterns of cultural variability and environmental factors.

Chapter 2 discusses the theoretical and logical underpinnings of the consideration of ceramic decorative styles carried out in this study. The development of this body of theory is briefly summarized. Recent research which views style as a dynamic, interactive, and behaviorally based phenomenon (Carr 1985a, 1985b; Carr and Rosenthal 1986; Voss and Young 1989; Wiessner 1983, 1984) is emphasized. Certain assumptions concerning ceramic vessels as an analytic unit are also discussed. This includes aspects of vessel function, their context of use, as well as their suitability to serve as conveyors of social information.

Analysis of the large ceramic assemblage from the Skegemog Point site is detailed in Chapter 3. The general importance of the assemblage and previous research employing the ceramics are summarized. The methods used for this segment of the analysis are then presented. Sherd weights grouped by surface treatment types are used as a measure of ceramic density across the site. Classification of the ceramic vessels is accomplished through the use of cluster analysis. The original classification (Cleland n.d.a.) is also briefly summarized, since it strongly influenced this stage of the analysis. This provides a contextual framework for the discussion of the attributes examined in this analysis and the results of the cluster analysis. The general structure of the original ceramic classification was confirmed by this process. Finally, temporal affiliation and general external relationships of the defined ceramic wares are discussed.

Chapter 4 presents an analysis of the organization of space at the Skegemog Point site. This stage of the analysis provides information concerning the nature of the social groups inhabiting the site and the types of activities carried out during those occupations. Through this process a better understanding of the contexts within which the ceramic vessels functioned is attained. Using contingency table analysis and simple factor analysis patterns of co-variation between ceramic types, stone tools, debitage, and features are explored. A discussion of the structure of the lithic technological subsystem is also presented. The results of this analysis are interpreted within the framework of a hearth-centered model of spatial organization. The place of these occupations within a broader settlement and subsistence system is also considered within the context of Binford's (1980) residential versus logistic patterns of settlement organization.

The final chapter places the ceramic design variability identified at the Skegemog Point site within a regional context. The focus of this stage of the analysis is the relationship between the Skegemog Point ceramic assemblage and the assemblages from a number of sites located in the Carolinian-Canadian transition zone in west

central Michigan. The degree of similarity or dissimilarity between these ceramic sets is viewed as one means of gauging the presence and relative strength of social boundaries within the region. Once again cluster analysis is employed as the primary analytic method to address this question. Results of the cluster analysis are considered in terms of hypothesized locations of social boundaries within the region suggested by Cleland (1990). The resultant patterns are also evaluated with respect to Voss and Young's (1989) six expectations for the interpretation of regional design attribute patterning.

RESEARCH UNIVERSE

A combination of physiographic and cultural features define the geographic limits of the study area (Figure 1). The location of earlier and current research projects also influences the limits of the study area. The shores of Lake Michigan form the western boundary of the study area. This feature served as an important transportation route, facilitating the north-south movement of people.

The southern end of the Traverse Corridor forms the northern boundary of the study area. North of this line, the Carolinian-Canadian transition zone becomes very narrow and is restricted to the coastal plain. The Traverse Corridor itself has been the subject of extensive archaeological investigation involving both in-depth survey (Brashler 1972; Cleland 1966b, 1967a, 1967b, 1973, 1974, n.d.b.; Lovis and Cleland 1979) and excavation (Cleland n.d.a.; Lovis n.d.a., n.d.b., 1971, 1973; Masters n.d.; McGonagle n.d.). The region has also figured prominently in several considerations of the regional settlement systems and interaction patterns (Holman 1978; Lovis 1973, 1978; Luedtke 1976).

The eastern boundary of the study area is located along the divide between the river systems flowing west to Lake Michigan, those flowing eastward to Lake Huron, and those flowing southeastward to Saginaw Bay. The headwater regions of the

Figure 1. The Study Area and Site Locations

Key to Site Locations:

1. Juntunen
2. O'Neil
3. Henderson Lamb
4. Schuler
5. Skegemog Point
6. Boven
7. Aetna I
8. Aetna II
9. Santer
10. Point Arcadia
11. Bear Swamp (Greene Collection)
12. McGlynn
13. Manistee Blacker Airport Site 3
14. Magoon Creek
15. Porter Creek North and South
16. Sheridan Township, Mason County
(Greene Collection)
17. Harrison Area Sites
(Cushman Collection)
18. Custer-Walhalla Survey,
Pere Marquette River
19. Dumaw Creek
20. Silver Lake
21. Little Pebawma Village
22. Juniper Beach
23. Spring Creek
24. 20GR91
25. Mocassin Bluff

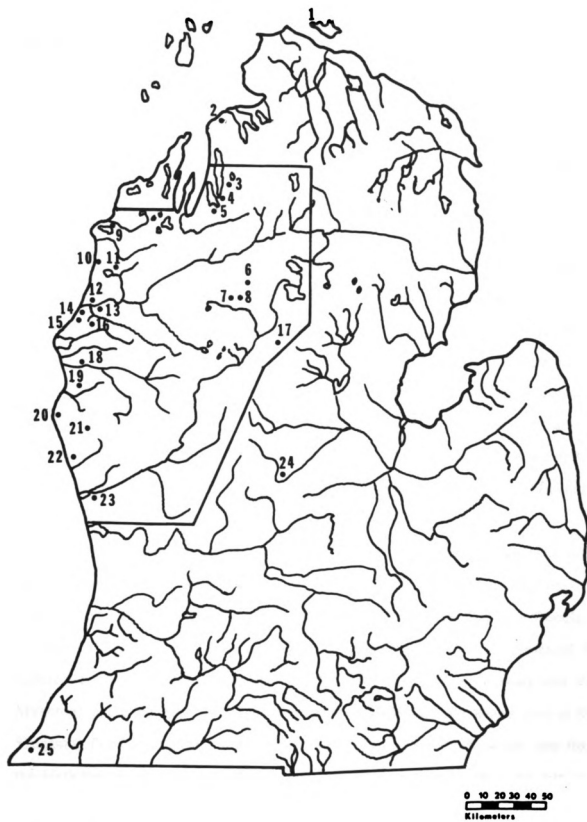


Figure 1.

Manistee and Muskegon Rivers provide the primary geographic reference points for this boundary. Further, research regarding the Woodland period adaptations in the region to the east of these drainage divides is currently being conducted by John O'Shea and Claire McHale-Milner, Museum of Anthropology, University of Michigan.

The southern boundary of the research area lies along the Muskegon River. The area to the south of the Muskegon River has received close attention in Brashler's (1981) study of early Late Woodland boundaries. This line also roughly corresponds to the northern extent of the Carolinian biotic province in western Michigan.

The temporal focus of this study is the Late Woodland period. Beginning around A.D. 600-700, the Late Woodland period extends to the advent of European contact in the early part of the seventeenth century (Fitting 1975; Mason 1981). The inception of the Late Woodland period is generally associated with significant changes in the adaptive strategies of cultural groups in the region. These changes are represented by shifts in the structure of the settlement systems, subsistence economies, and artifact inventories. (Cleland 1966a; Fitting 1975; Mason 1981; Mueller 1980). It is during this period that the development of general structure of the societies and patterns of cultural interaction initially encountered by the Europeans took place.

The Late Woodland period is typically subdivided into two phases. The early phase is most often simply referred to as the early Late Woodland period (Brashler 1981; Holman 1978; Lovis 1973), although Initial Late Woodland and Late Woodland I (Mason 1981) have also been used. A number of regional phases represented by different ceramic wares have been identified for this period. Within the study area, the Skegemog phase has been named after the primary early Late Woodland ware at the Skegemog Point site (Cleland n.d.a.; Lovis 1973:11). A single radiocarbon date from the ninth century A.D. has been associated with Skegemog wares from this site (see Appendix 1). Skegemog wares also show broad typological similarities with Mackinac ware to the north (McPherron 1967) and Spring Creek and Allegan ware to the south

(Brashler 1981; Fitting 1968) of the study area. Thus, the Skegemog phase is considered to span the period between A.D. 800 and A.D. 1100 (Lovis 1973:11).

Bowerman ware, the other early Late Woodland ware identified at Skegemog Point, has not been directly dated. Estimation of its age relies on typological affinities with better dated wares in the region. Broad similarities exist between Bowerman ware and the earlier variants of Allegan and Wayne ware. A date range between approximately A.D. 600/700 and A.D. 900/1000 is suggested for these ceramics. However, until additional samples are recovered in datable contexts, the age and relationship of Bowerman ware to other early Late Woodland ceramic wares will remain incomplete.

The late phase of the Late Woodland period is similarly referred to by several different terms: Terminal Late Woodland, Late Woodland II, and late Late Woodland. The latter usage is preferred here. In the Grand Traverse Bay area, the Traverse phase succeeds the Skegemog phase. Relying on several radiocarbon dates from the Skegemog Point site (see Appendix 1), Lovis (1973:12) dates the Traverse phase between A.D. 1200 and A.D. 1450. Typological similarities with other late Late Woodland ceramic types and radiocarbon dates from other Traverse phase sites indicate that the phase may begin in the eleventh century A.D. and persist into the sixteenth century or later.

BACKGROUND RESEARCH

This section summarizes the history of archaeological research in the west central part of Michigan. A number of studies conducted in adjoining areas that strongly influenced the orientation of this research are also discussed. The questions addressed in this study represent a continuing effort to understand Late Woodland adaptations and interaction patterns within an ecologically transitional area.

Archaeological research in the west central portion of Michigan has been limited in the past. The earliest accounts for the region generally consist of reports of mound excavations such as those along the Boardman and Manistee Rivers (Leach 1903) and in Cadillac, Michigan (Manktelow 1898a, 1898b). Although surveys had been initiated by the 1920s, most of the work was directed towards the southern portions of the state. The reports from this time can be characterized as brief, vague, and primarily antiquarian in orientation (Fitting 1966b:219).

The first surveys of western Michigan were coordinated by Wilbert Hinsdale, Curator of Great Lakes Archaeology, University of Michigan during the first several decades of the twentieth century. Work was conducted in northern and northwestern Michigan by Frank Vreeland (1924), in Oceana, Mecosta, and Newaygo Counties by Vernon Kinietz (1929), and in Oceana County by R. E. Southwick (1922). These surveys involved both field reconnaissance and collection of information from local informants. Much of this work was summarized and published by Hinsdale (1931) in An Archaeological Atlas of Michigan. Interestingly, Hinsdale's atlas indicates generally low densities of prehistoric sites in the majority of the counties in western Michigan. Notable exceptions occur in Newaygo and Grand Traverse Counties, and to a lesser extent in Missaukee County. This situation is still reflected in the listings of the site files for the state.

Excavations conducted in western Michigan during the first half of this century focused primarily on highly visible archaeological remains such as mounds and earthen enclosures. The University of Michigan's excavations at the West Twin Lake mound in Montmorency County, the Brooks mounds in Newaygo County (Hinsdale 1928b, 1930), and the Missaukee County earthworks (Greenman 1927a, 1927b; Hinsdale 1924, 1925) are the most prominent of these activities. After the hiatus in professional archaeological endeavors prompted by the Great Depression and World War II, the pattern of unsystematic survey and exploration of burial mounds and earthworks

resumed. The general neglect of northern Michigan by the professional community also continued.

Until the mid-1960s, most of the work in western Michigan was carried out by members of the Michigan Archaeological Society. In Missaukee County, the Aetna I and II earthworks were remapped and excavated further in the mid-1950s (Butterfield et al. 1955; Moll et al. 1958). Other mound and occupation sites were also investigated in the Manistee and Muskegon valleys by Gillis and Davis of the Wright L. Coffinberry Chapter (Gillis 1960; Gillis and Davis 1959, 1960, 1961a, 1961b; Prah 1970, 1980, 1991).

Davis and Gillis (1959) were also the first to report on investigations at the Eastport site in Antrim County. Shortly thereafter, further excavations were conducted at the site by the University of Michigan (Binford and Papworth 1963) as part of research correlating prehistoric occupations with post-Pleistocene lake elevations. Analysis of the lithic assemblage from this site represents one of the first systematic studies of lithic technology in the Upper Great Lakes region. Although these investigations indicated a Late Archaic age for the site, more recent investigations have confirmed the presence of a Late Woodland component as well (Cleland, personal communication 1991).

As a summer resident of the Pentwater area, George I. Quimby, then on the staff of the Chicago Field Museum of Natural History, was also adding to a slowly growing body of information for Oceana and Muskegon Counties. His efforts include reporting the results from excavations at the Stoney Lake Mounds, the South Flats Club enclosure, and the Spring Creek site (Quimby 1964, 1965), and an analysis of a collection from the Dumaw Creek site (Quimby 1966)

Importantly, it was also around this time that a major shift in the research orientation of Michigan archaeology began to take place. The University of Michigan, under the direction of James B. Griffin (1960), was conducting research in the Saginaw

Valley that would ultimately serve as a foundation for much of the subsequent research in Michigan. The basic orientation of archaeological investigation was no longer primarily culture historical in nature. Archaeological data was now being used as a means to explore cultural processes and to understand the nature of the cultural adaptation to the post-Pleistocene environments in the Upper Great Lakes (Binford 1972; Griffin 1976; Pebbles 1978). This approach was further refined by the adoption of the ecological concepts of biotic provinces (Dice 1943) and intervening ecotones or transition zones (Odum 1965) as an integrative device in several influential studies (Cleland 1966a; Fitting 1966a; Yarnell 1964).

In order to investigate the interrelationships between prehistoric cultural adaptations and the Carolinian-Canadian transition zone, fieldwork was initiated by Cleland (1966b, 1967a, 1967b) and Fitting (1966a). This initial research was funded by separate but complimentary grants from the National Science Foundation and internal institutional research grants from Michigan State University and the University of Michigan. Under the aegis of these grants and as a result of its unique environmental configuration, western and northwestern Michigan once again became the focus of professional archaeological investigation.

The scope of the edge area investigations organized by Fitting (1966a) was very broad, involving a number of widely dispersed projects located in both the Carolinian-Canadian transition zone and the adjoining biotic provinces. Several of these projects were located in western Michigan. In 1965, Brunett (1966) conducted a survey of the central Manistee Valley between Sharon and Sherman, Michigan. Although virtually all time periods are represented, Late Archaic and Late Woodland components are the most abundant among the 17 reported sites (Brunett 1966). The latter sites were represented by several mound groups and small, diffuse artifact scatters.

Further to the south, during the same summer, a field crew directed by Earl Pahl began a survey of the central Muskegon Valley, focusing on the concentration of

mounds in the Newaygo-Croton area (Prahl 1966, 1970, 1991). This work continued the following summer with funds provided by a Rackham Research Grant from the University of Michigan. In addition to continued work on the Middle and early Late Woodland mounds in the area, excavations were also conducted at the Middle Woodland Jancarich Village site (Prahl 1970:259-301). A second nearby Middle Woodland habitation area, the Toft Lake site, was also tested by members of the Newaygo Chapter of the Michigan Archaeological Society (Losey 1967).

An analysis of the excavations conducted at the Spring Creek site during the mid-1950s by Gillis and Davis was also undertaken by Fitting (1968a) as a part of the edge area investigations. Although the site had received cursory examination in 1931 by Bingham and Guthe and again in 1932 by Quimby, the first large scale excavations at the site were conducted by Gillis and Davis (Fitting 1968a; Martin 1990). The ceramic assemblage recovered from these excavations forms the type collection for the definition of Spring Creek ware, a regionally distinctive early Late Woodland ceramic type (Brashler 1981; Fitting 1968a). Additional excavations at the site were undertaken in 1966-1967 by the Newaygo County Chapter of the Michigan Archaeological Society (Karston 1968) and again in 1968-1969 by Richard Flanders, Grand Valley State College. The ceramics recovered by Flanders were used by Brashler (1981) in her analysis of early Late Woodland ceramics and interaction patterns in southern Michigan. Analysis of the faunal assemblages from these excavations has also been undertaken by Martin (1976, 1990). These analyses suggest that the site is a small, cold season encampment used repeatedly over a number of years by a series of family groups (Martin 1991:135-136) rather than the intensively occupied village suggested by Fitting (1968a).

In contrast to Fitting, Cleland (1966b 1967a, 1967b) and Baldwin undertook intensive investigation of one small part of the Carolinian-Canadian transition zone. The Grand Traverse Bay region was selected primarily because of the close geographic

juxtaposition of a series of discrete micro-environments bordering the major biotic provinces (Cleland 1966b). Initially, the project involved a survey program in Grand Traverse, Antrim, Kalkaska, and Missaukee Counties. Test excavations were also conducted at the Aetna I and II and Boven earthworks in Missaukee County and at the Skegemog Point site in Grand Traverse County (Baldwin 1965; Cleland 1965, n.d.a.). During the following summer of 1966, excavations at the Skegemog Point site continued and were expanded to include the adjacent Early Archaic Samels Field locale. Survey efforts were also expanded northward through the Traverse Corridor to the Straits of Mackinac region.

The Traverse Corridor survey discovered a large number of sites, a number of which were subsequently excavated to varying degrees (Cleland 1967a, 1967b; Lovis n.d.a., n.d.b., 1971, 1973; Masters n.d.; McGonagle n.d.). The majority of these sites date to the Late Woodland period, although a number of Archaic and earlier Woodland age components were also identified. Site locational information clearly showed that the major occupation sites are largely restricted to the narrow littoral plain along Lake Michigan where the climate is ameliorated and the level of environmental diversity is higher (Cleland 1967a, 1967b). Site densities in the adjacent highlands are low, consisting primarily of small artifact scatters. Using ceramic stylistic data, Lovis (1973) conducted a formal test of the nature of the Late Woodland cultural dynamics within the Traverse Corridor. Tests of association and trend surface analysis indicated that the corridor was used by populations based in the areas at each end of the region, confirming the hypothesis that the region served as an avenue for interaction between northern and southern tier cultural groups (Cleland 1966b; Lovis 1973).

The distribution of decorative attributes also suggested a possible third avenue for cultural interaction (Lovis 1973:307-311). In order to investigate this proposition, a program of site survey and excavation was initiated in the Inland Waterway region of northern lower Michigan (Lovis and Cleland 1973, 1979). As with the Traverse

Corridor, most of the sites identified by this project date to the Late Woodland period. A number of Late Archaic and transitional Middle to Late Woodland occupations were also identified. Using this data in conjunction with data from the Traverse Corridor, Holman (1978) was able to study the settlement system of the Mackinac phase as a response to the geographic and seasonal fluctuations of food resources. A pattern of residence along the coastal areas during the warm season and dispersal into the interior lake and river systems during the cold season was proposed. Holman (1978) also presented evidence which strongly argued for an in situ development from the Middle to Late Woodland.

After the Manistee and Muskegon valley projects, the amount of archaeological activity in west central Michigan decreased. Fitting (1967, 1968a, 1975) published a brief analysis of a small Late Woodland lithic assemblage from the Hamlin Lake site in Mason County and a brief synopsis of the Bear Creek site in Manistee County. In the Pere Marquette River valley, Nowak and Fisher (1971) conducted a survey between Custer and Walhalla, Michigan. A total of 16 Archaic through Woodland period sites were identified, surface collected, and tested during the course of this project (Nowak and Fisher 1971). The Scott site in Mason County was also investigated around this time (Michigan State University Museum site files).

With the passage of legislation concerning cultural resource management and its implementation in the mid-1970s, additional impetus and funding for archaeological work in western Michigan was provided. A shift in the nature of archaeological work in Michigan accompanied this process. Site inventory and significance evaluation needs of specific construction or land management projects now became the primary determinants for the location of archaeological work. Questions regarding the inter-relationships between culture and the environment, and aspects of exchange and boundaries between cultural groups continue to figure prominently as general problem orientations in the evaluation of archaeological resources (Mueller 1980:60-67).

Most of the work conducted under the rubric of cultural resource management in the study area over the last 15 years has consisted of Phase I evaluations. Annual lists of archaeological reports received by the Michigan Bureau of History (e.g., Mead 1985, 1987, 1988, 1989; Orser 1984) indicate that these projects tend to encompass small areas and rarely encounter significant cultural resources. Major survey projects in the region include the US-31 highway corridor in Mason County (Prah 1975, Lovis 1978b), an overview of the Sleeping Bear Dunes National Lakeshore (Lovis et al. 1976), the proposed US-131 alternates in Wexford County (Holman and Robertson 1988), and a survey of the Upper Muskegon Valley in the High Plains region (Prah et al. 1981). To date, no Phase III mitigation projects have been conducted in west central Michigan.

In the Manistee National Forest, which covers large portions of western Michigan, an important and ongoing program of cultural resource inventory was begun in the late 1970s (e.g., Barnhill-Booher et al. 1979; Branstner 1983, 1985, 1987; Brashler 1978, 1980; Ebright 1986; Lovis et al. 1978). While these surveys have identified the location of hundreds of sites from all time periods, very few have been subjected to more extensive testing. In recent years, however, several Late Woodland sites have been tested. Included here are the Porter Creek South site in Mason County (Holman and Hambacher 1989) and the Ranger Walker I and II sites in the lower White River Valley (Branstner, ed. 1991). Additionally, recent efforts of the members of the Manistee Chapter of the Michigan Archaeological Society have brought to light collections from Late Woodland period sites such as the Point Arcadia (Hambacher 1988; Ursum 1985), Magoon Creek (Ursum 1980), and McGlynn sites (Ursum, personal communication 1987) in Manistee County. Most recently, small Late Woodland components have been reported from the Platte River Campground site (Richner 1991) and from 20GT58 (Hambacher and Branstner 1991).

STATEMENT OF THE PROBLEM

Since the mid-1960s, questions relating to the inter-relationships between culture and the environment and the structure of inter-cultural boundaries and exchange have dominated Michigan archaeology. The concepts of ecotones or transition zones and major biotic provinces have served as key organizing principles for this work. Ironically, although the cultural adaptations to the Carolinian-Canadian transition zone lay at the heart of the edge area projects, large portions of that region were never fully explored or considered. As described above, most of the work conducted in the region has involved either survey or site specific investigations. Other than Prahl's (1970, 1991) summary of the Muskegon Valley Hopewell, no broad consideration of the region has taken place. The fundamental questions concerning the nature of the adaptations to the transition zone itself, and the nature of cultural boundaries across the region remain largely unanswered.

The questions examined in this study ultimately stem from the edge area studies initiated by Cleland and Fitting a quarter of a century ago. Because of this, it is useful to take a closer look at the conceptual basis of some of that initial research. Several other studies which have a direct bearing on the cultural dynamics in the Carolinian-Canadian transition zone of western Michigan are also examined. This includes two studies examining the nature of the cultural boundaries in the areas adjacent to the study area (Brashler 1981; Lovis 1973) and Luedtke's (1976) study of exchange and interaction patterns across lower Michigan.

Utilizing the work of Dice (1943) and Odum (1965), Cleland (1966a) formally developed the concept of major biotic provinces and intervening ecotones as the focus of a research strategy designed to investigate their effect on cultural processes within a prescribed region. At that time, it appeared that the prehistoric inhabitants of Michigan, particularly during the Woodland period, were broadly adapted to the major biotic provinces creating a north-south cultural dichotomy (Cleland 1966a; Fitting 1966a,

1975). Information derived from the historically known cultural adaptations in the Upper Great Lakes region support this contention. The nature of the interaction between these two cultural traditions, and the use of the ecological transition zone between them, however, remained unclear. As stated by Cleland (1966a:96) it was expected that "where the (transition) zone was narrow and bordered on two sides by different cultural adaptations it became an unoccupied zone of conflict", but "more frequently, the transition zone was wide enough to support its own unique cultural adaptation".

The above proposition lies at the heart of the fieldwork initiated by Cleland (1966a, 1967a, 1967b) and Fitting (1966a) under separate but complimentary research grants. The investigations coordinated by Fitting (1966a) were very broad in nature, examining sites located within the transition zone and in the adjacent biotic provinces as well. Several important general conclusions were drawn about the Carolinian-Canadian transition zone in central Michigan from this work (Fitting 1996a:146-148). First, these studies indicated that the transition zone in Michigan should be thought of as "more-or-less northern or southern" in character rather than as a phenomenon with abrupt, sharply defined boundaries (Fitting 1966a:146). Second, it was found that the proposition that ecotonal areas often have higher carrying capacities than the adjoining biotic communities (Odum 1965:278) did not hold true in this instance. Rather, the Carolinian-Canadian transition zone is an area with an intermediate carrying capacity. The "edge effect" in this instance is reflected by an increase in the variety and diversity of species in the ecotone (Fitting 1966a:147). Finally, a broad correlation between the width of the transition zone and the rate of decline in site densities was noted (Fitting 1966a:147).

The investigations undertaken by Cleland (1966b, 1967a, 1967b) were designed to gain an in-depth understanding of one small part of the transition zone. The close juxtaposition of several distinct environmental zones around the southern end of Grand

Traverse Bay made it ideal for these purposes. Research efforts were later expanded to include the entire Traverse Corridor. Survey of the region along with excavations at a number of sites including the Skegemog Point site were directed towards addressing two basic questions. These questions concerned the nature of the cultural adaptations to the different micro-environmental zones in the area and the manner in which these adaptations affected population distributions and movement across the Carolinian-Canadian transition zone (Cleland 1966b:2). Preliminary considerations of the recovered data indicated that throughout prehistory, and particularly during the Late Woodland period, occupation was largely restricted to the coastal area comprising the Traverse Corridor. Thus, it was proposed that the region served as a nexus linking northern and southern cultural and natural areas (Cleland 1967b, 1974).

In order to develop a general model for the prehistoric adaptations to the major biotic provinces of the Upper Great Lakes, Fitting and Cleland (1969) examined the nature of the historic period adaptations in these areas. In the north, the highly mobile hunting and gathering strategy employed by the Chippewa was used to characterize the adaptation to the Canadian biotic province. The general adaptive pattern to the Carolinian biotic province is represented by the agriculturally based system of large sedentary villages of the Miami and the Potawatomi. In between these two areas, the Ottawa with their mixed economy and semi-sedentary settlement system typified the adaptation to the intervening Carolinian-Canadian transition zone. These patterns were then projected back through time and used as a means to understand the adaptive shifts which occurred during the Late Woodland period (Fitting 1969, 1971; Fitting and Cleland 1969). While these patterns were developed as "technic ecotypes" (Fitting 1969:372), the fact that they appear to have substantial time depth suggests that some form of cultural boundary maintenance is involved as well.

A formal test of Cleland's (1966b, 1967a, 1967b) proposition that the Traverse Corridor served as a natural passage facilitating interaction between northern and

southern natural and cultural areas during the Late Woodland period was conducted by Lovis (1973). To this end, two hypotheses relating to the diffusion of cultural traits were posed: 1) micro-style zones are present in the area and can be recognized, and 2) directional trends in the attributes examined are present and can be recognized (Lovis 1973:256-258). Using aspects of ceramic decoration to test these hypotheses, it was demonstrated that the Traverse Corridor was indeed an area of considerable interaction and mutual use between several different cultural groups.

Multi-dimensional scaling using a phi coefficient as the measure of association was employed in the search for micro-style zones in the Traverse Corridor (Lovis 1973:273-275). The results of the analysis indicated that stylistic similarity between sites was not a function of geographic proximity. This led Lovis (1973:319) to conclude that there is no "organized spatial structure to community interaction based on ceramic styles". That is, no discrete micro-style zones could be identified on the basis of ceramic decorative similarity. As a result, the Traverse Corridor was interpreted as an area of shared use between populations based in the Straits of Mackinac region to the north, (Mackinac, Bois Blanc, and Juntunen phases) and around the southern end of Grand Traverse Bay to the south (Skegemog and Traverse phases) during a portion of their annual economic round.

The second hypothesis, that there are directional trends of style diffusion, was tested through a trend surface analysis of the proportional frequencies of ceramic decorative attributes across the region (Lovis 1973:275-277). The resulting maps indicated that stylistic input was derived from at least three directions. Two of the directions of stylistic input are from the north and the south along the coast of Lake Michigan. The third source of stylistic variability is through the Inland Waterway region, an interconnected chain of lakes and rivers extending northeast from the center of the Traverse Corridor to the shores of Lake Huron. Of interest here is the fact that the southernmost two sites in Lovis' (1973:299, 313) analysis, Skegemog Point and

Fauver, displayed a pattern of stylistic similarity and geographic proximity not shared among the other sites. This may be interpreted as consistent with the presence of a resident population in that area.

Luedtke (1976) conducted an analysis of exchange and interaction patterns during the Late Woodland period across lower Michigan, including the Carolinian-Canadian transition zone. Part of this study examined the distribution of a number of different chert types within the transition zone. Primary among these is Norwood chert from the Grand Traverse Bay region. North and east of the source area the decrease in the percentage of Norwood chert is rapid and linear. Luedtke (1976:361) argued that this distribution resulted from close contacts between groups around the Pi-wang-goning Quarry and those to the north and east. More recent studies have indicated that these patterns are, in fact, the result of the periodic movement of people from the Straits of Mackinac and the Inland Waterway regions into the quarry area (Holman 1978; Lovis and Cleland 1979).

Immediately south of the source area, the distribution of Norwood chert exhibits a similar pattern (Luedtke 1976:355-359), representing the exploitation of the quarry resources by Skegemog and Traverse phase populations. Beyond 60 km, however, a nearly exponential decline in the percentage of Norwood chert occurring over a much larger area is seen (Luedtke 1976:355). This is interpreted as commensurate with "down-the-line" gift exchange between a series of cultural groups along the coast (Luedtke 1976:359). Lambrix chert from central Oceana County exhibits a similar pattern of distribution across the western part of the transition zone (Luedtke 1976:375-379). In fact, this form of interaction was found to be largely restricted to the transition zone.

Several other types of evidence were examined for information relevant to the study of interaction patterns. Among these are the distribution of different ceramic wares within the Carolinian-Canadian transition zone (Luedtke 1976:392-398). Relying

on the ceramics from the Spring Creek and Butterfield sites, it was argued that northern and southern ceramic traits are balanced and that the ceramic wares maintained their individual integrity. This, along with the fact that the gift exchange of chert was largely restricted to the transition zone, indicated that the transition zone was used by groups from several cultural traditions (Luedtke 1976:401-402). The existence of a separate cultural group within the transition zone was not supported. Therefore, gift exchange was viewed as one means by which different social groups maintained contact with one another.

However, several problems exist with these interpretations. Luedtke's (1976) consideration of the ceramic interaction patterns relied on a small number of sites and was impressionistically based. Information was drawn primarily from two sites, the Butterfield site in Bay County (Wobst 1968) and the Spring Creek site in Muskegon County (Fitting 1968a). Not only are these sites located at opposite sides of the state from each other, but their occupations are largely restricted to the early Late Woodland period. Since Lovis' (1973) study is based on a much larger sample of sites and examines both the early and the late phases of the Late Woodland period, Luedtke's (1976) extension of the interaction patterns identified in the Traverse Corridor must be viewed cautiously. Furthermore, the ecological and physiographic structure of the Traverse Corridor and the Carolinian-Canadian transition zone south of it are very different from one another.

Bracketing this work to the south, Brashler (1981) conducted a study of early Late Woodland boundaries and interaction patterns in the Carolinian biotic province. Using a variety of clustering algorithms, the internal structure and interrelationships of the stylistic attributes of the three major "southern tier" ceramic wares was explored. A series of conclusions concerning early Late Woodland interaction patterns were drawn using Barth's (1969) typology of relationships between groups and Yellen and Harpending's (1972) model of hunter-gatherer social patterning as a frame of reference.

Each of the three ceramic wares was shown to be composed of a discrete configuration of decorative attributes (Brashler 1981:335). The wares are distinguished from one another by changes in the relative frequency of groups of attributes such as rim form, presence and type of lip decoration, and the amount of exterior decoration present. While the different ceramic wares can be statistically differentiated, a high degree of similarity is also present among them. This situation is interpreted as ~~/~~ an indication that the social boundaries between the makers of Allegan, Spring Creek and Wayne ware are highly permeable (Brashler 1981:335-336). The distribution of these ceramic traditions also closely corresponds with specific geographic regions defined by major river drainages. Finally, it was concluded that the relationships within and between traditions were qualitatively different from those to the north and south (Brashler 1981:335-336). That is, stronger social boundaries existed between these groups and the populations located to the north than among the groups in located in the Carolinian biotic province.

To date, these types of broad, regionally based comparisons have not been conducted for the region lying between the Traverse Corridor and the Carolinian biotic province. Despite all the work carried out in western Michigan since the initiation of the edge area studies, the Late Woodland cultural dynamics of the region remain poorly understood. Information pertinent to this question, however, is available from the Skegemog Point site lying at the northern end of the region. Results of these excavations have been summarized in a preliminary manuscript (Cleland n.d.a.). The definition of a previously unknown series of ceramic wares is the primary focus of that manuscript.

The purpose of this dissertation is to continue the exploration of the Late Woodland cultural dynamics in the Carolinian-Canadian transition zone of western Michigan. The fundamental question is whether or not the region supported a resident population and, if so, what the nature of that adaptation was. The converse of this

question is that the region did not support a resident population, but rather, was used by populations based in the adjacent biotic provinces for only a segment of their annual economic round. Attributes of ceramic decorative style are used to test these propositions. The analysis proceeds in two stages and involves several specific research goals.

The first stage of the analysis focuses on the Skegemog Point site. The Skegemog Point site is the largest known occupation site in the region between the Spring Creek and Juntunen sites. Large scale excavations have been conducted at the site and it is the type site for a distinctive series of ceramic wares (Cleland n.d.a.). First, the structure of the ceramic decorative variability present at the site is examined as a statistical test of Cleland's (n.d.a.) intuitively based classification. The large ceramic sample from the Skegemog Point site ensures that an adequate sample of the range of stylistic variability in the region is represented. Second, the spatial dynamics of the Skegemog Point site are examined. Patterns of spatial co-variation among the artifact classes are used to determine the range and organization of activities at the site through time. Thus, a better understanding of the manner in which the Late Woodland cultures in the region were organized is gained. An understanding of the social context within which ceramic vessels functioned is also attained.

The second stage of the analysis directly addresses the question of a resident population in the Carolinian-Canadian transition zone by placing the Skegemog Point site within a regional context. If a resident population is present, it is expected that a degree of stylistic homogeneity will be observed across the region. The range of stylistic variability present in the region must be such that the ceramics can be distinguished from the range of stylistic variation documented in the ceramic assemblages from the adjacent regions. Temporal changes in the degree of similarity of the ceramic assemblages used in this stage of the analysis permit monitoring of shifts in the structure and nature of cultural boundaries in the region. Once the patterns of

ceramic variability across the study area are identified, correspondence with environmental features can be investigated.

PHYSIOGRAPHIC AND ECOLOGICAL SETTING

The physiography and ecological setting of the study area is described in this section. As noted by Cleland (1966a:1-3), cultural systems are inextricably linked to their physical world and in order to fully understand cultural processes, they must be studied within the context of their environmental matrix. This allows identification of salient environmental features influencing or otherwise affecting the nature and structure of cultural adaptations in the region.

The landforms present across Michigan are the result of the sculpting actions of the Wisconsin ice sheets and torrents of outwash flowing from their margins. In their wake, the glaciers left behind a series of moraines separated by intervening zones of outwash. Trending in a general north-south direction, these glacial features roughly parallel the coast of Michigan, slowly gaining elevation until the interior highlands are reached (Farrand and Hill 1982) (Figure 2). Lacustrine deposits from the post-glacial lakes are largely restricted to a narrow zone along the modern Lake Michigan coastline. More extensive lacustrine deposits, however, are located on Big Sable Point, in the lower Manistee Valley and between the Port Huron and Manistee moraines, and in the area around Lakes Cadillac and Mitchell in the central part of the state (Figure 2). Finally, massive sand dunes cap the morainic and lacustrine deposits along the coast of Lake Michigan. Additional dune deposits occur sporadically across the outwash plains in the southwestern portion of the study area.

Figure 2. **Quaternary Geology of the Study Area**
(after Farrand and Hill 1982)

Key to Glacial Deposit Types:

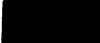
	Dune Sand
	Outwash Sand and Gravel
	Fine and Medium Textured Glacial Till
	Coarse Textured Glacial Till
	Fine and Medium Textured End Moraines
	Coarse Textured End Moraines
	Ice Contact Sand and Gravel
	Peat and Muck
	Lacustrine Sand and Gravel



Figure 2.

The glacial moraines in the region tend to be composed of coarse textured tills, except for the highly discontinuous Whitehall and the Manistee moraines along the Lake Michigan coast, (Farrand and Hill 1982). The till comprising these moraines is primarily fine and medium textured (Farrand and Hill 1982). The outwash plains and the lacustrine deposits are typically composed of sand and gravel deposits (Farrand and Hill 1982). As a result, the soils in the study area tend to be well drained. Highly organic soils associated with poorly drained areas are, for the most part, restricted to low lying areas along drainage ways and in the Houghton Lake area where extensive peat and muck deposits occur (Figure 2).

This array of glacial landforms has been organized into a series of physiographic regions defined by elevation above sea level and the degree of local relief (Sommers 1977:25) (Figure 3). The Houghton-Higgins Upland Plain, the Cadillac Hilly Upland, and the Kalkaska Hill-Land comprise most of the interior of the state (Sommers 1977:24). The first of these zones, the Houghton-Higgins Upland Plain, is characterized by high elevation and low local relief. Elevations mostly range between 1,000 and 1,200 feet (305 and 366 m) a.m.s.l., reaching up to 1,400 feet (427 m) a.m.s.l. in some areas. The elevation of the Cadillac Hilly Uplands ranges between 800 and 1,000 feet (244 and 305 m) along its western edge and up to 1,700 feet (518 m) in the Cadillac area. The Kalkaska Hill-Lands typically lie between 800 and 1,200 feet (244 and 366 m) a.m.s.l. North of these areas of high altitude are the Interlochen-Mancelona Plain and the Manistee-Grayling Plain. These two regions are characterized by medium to high altitudes and low levels of local relief. Together, these physiographic regions comprise the western two-thirds of the High Plains of Michigan (Davis 1936), which effectively forms the eastern boundary of the Carolinian-Canadian transition zone.

Figure 3. Physiographic Regions of Northern Michigan (after Sommers 1977:24-25)

Key:

- 1. Charlevoix Hill-Land**
- 2. Interlochen-Mancelona Plain**
- 3. Manistee Hill-Land**
- 4. Kalkaska Hill-Land**
- 5. Manistee-Grayling Plain**
- 6. Houghton-Higgins Upland Plain**
- 7. Ontonagon Upland Plain**
- 8. Michigan Lake-Border Plain**
- 9. West Central Rolling Plain**

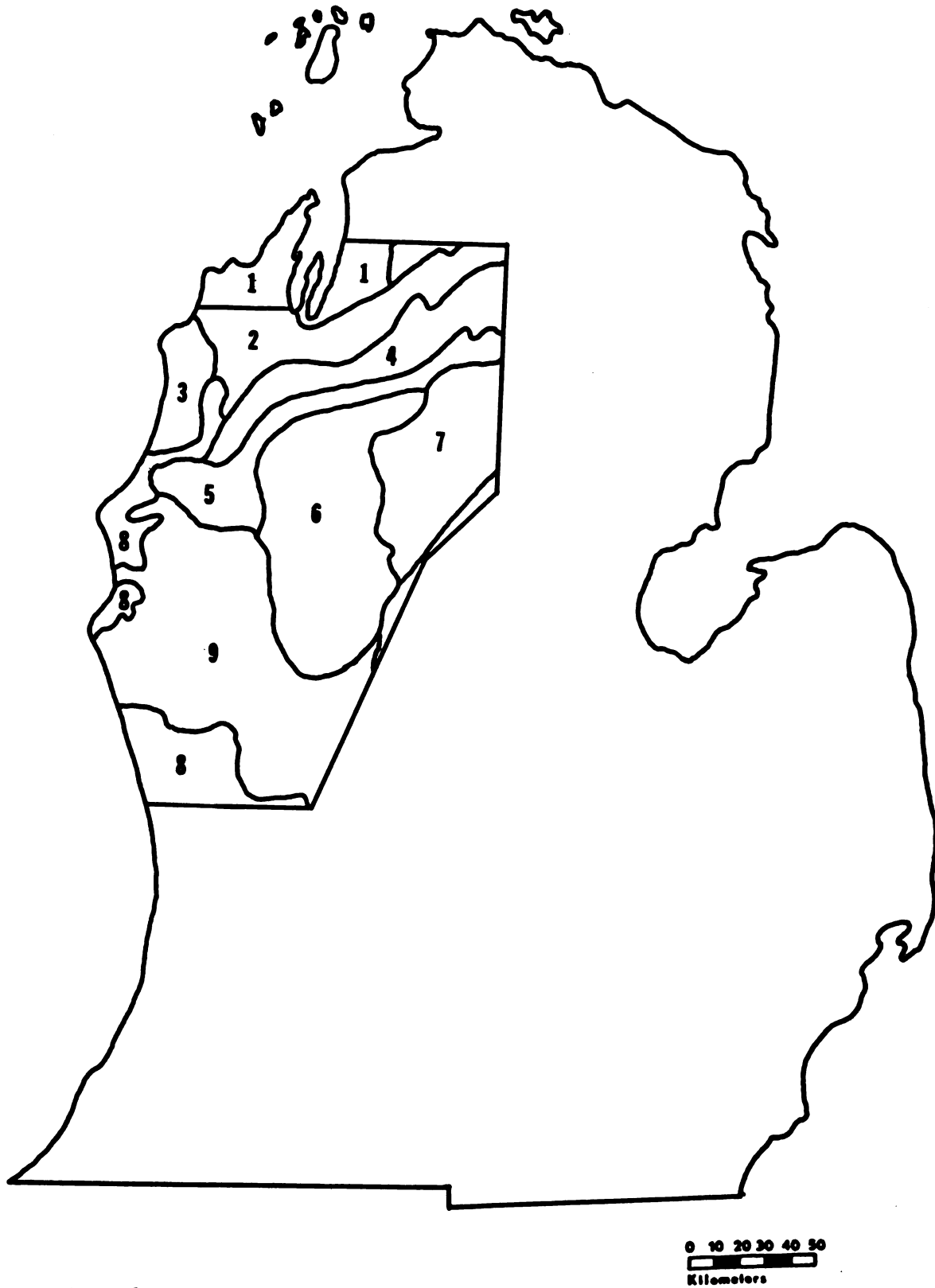


Figure 3.

South of this area is a large physiographic region known as the West Central Rolling Plain (Sommers 1977:24) (Figure 3). The topography of this region consists of rolling and undulating plains lying at medium altitudes, primarily between 800 and 1,000 feet (244-305 m) a.m.s.l. Bordering this zone to the west, the region between Big Sable and Little Sable Points has been classified as Michigan Lake-Border Plain (Figure 3). These areas are low lying and have little local relief, generally lying just above and below 600 feet (183 m) a.m.s.l. North of the Manistee River, the coastal area has been classified as the Manistee Hill-Land (Sommers 1977:24). This zone is characterized by elevations between 800 and 1,000 feet (244 and 305 m) a.m.s.l. and a high degree of local relief.

Cross-cutting and interspersed among these physiographic regions are a number of river and lake systems (Figure 4). The Muskegon and Manistee Rivers are the primary drainage systems in the study area. Draining 2,690 square miles of central Michigan (Marks 1973:47), the Muskegon is by far the largest of the two rivers. At 1,951 square miles, the Manistee River drains an area approximately two-thirds the size of the Muskegon River (Marks 1973:47). Both of these river systems originate in the central highlands of the state, providing easy access to the river systems draining northeastern Michigan and the Saginaw Valley. The occurrence of Skegemog and Traverse wares at sites around Hubbard Lake in northeastern Michigan (McHale and O'Shea 1984) indicate that these river valleys served as pathways for cultural interaction in the past.

Four other smaller river systems drain a significant proportion of the study area. The Pere Marquette, White, and Big Sable Rivers drain much of the area lying between the Muskegon and Manistee Valleys. Originating in the Charlotte moraine along the western flanks of the High Plains, these rivers bisect the Whitehall and Lake Border morainic systems, preventing them from acting as an impediment to the movement of people. North of the Manistee Valley, the Boardman River drains the Mancelona Plain



Figure 4.

Major River Drainages and Lakes of Western Michigan

situated between the main Port Huron and Manistee moraines (Eschman, et al. 1977). Most of the area west of the Boardman Valley is drained by the Betsie and Platte Rivers, both of which are small, each draining an area of 250 square miles or less. In addition to these river systems, a number of small streams drain directly into Lake Michigan. While these small creek systems do not provide access to the interior of the state, they are frequently associated with important resource areas such as swamps and small lakes (Hambacher 1988; Holman and Hambacher 1989).

An abundant number of inland lakes exhibiting a considerable range in sizes are also present across the study area. In his summary of the surface waters of northwestern Michigan, Marks (1973:49-51) indicates a total of nearly 100,000 lakes five acres or more in extent in this part of the state, with each of the counties containing a minimum of 2,500 surface acres of lake surface. The distribution of lakes across the landscape, however, is not uniform. In general, the majority of the lakes occur in one of three areas; the central highlands, the coastal areas, and the inter-morainic outwash plains. The central highland contains some of the largest lakes in the study area: Lakes Houghton, Higgins, Mitchell and Cadillac. Other large lakes occur in the coastal regions. To the north, Elk Lake is ranked as the sixth largest lake in northwestern lower Michigan (Marks 1973:51). South, along the Lake Michigan coast, a number of the rivers and streams empty into bar lakes occupying their drowned mouths. These range in size from very large, such as Muskegon and Manistee lakes, to very small, such as Lake Arcadia. Although the lakes in the inter-morainic outwash plains tend to be much smaller, they quite frequently occur in clusters. Examples of this situation can be found around Big Star Lake near Baldwin, Michigan and Duck and Long Lakes southwest of Traverse City, Michigan. Finally, those lakes which do occur on the moraines tend to be small "pothole" lakes.

Stretched across this highly varied and dissected landscape is a distinctive pattern of floristic communities. The unique character of the vegetation in the Upper

Great Lakes region was recognized as early as the seventeenth century (Fritzell 1983; Maycock and Curtis 1960). Ever since that time, the most appropriate way to characterize the vegetation of the region has been the subject of extensive debate (Harshberger 1911; Sargeant 1884; Transeau 1905; Weaver and Clements 1929). It was not until Nichols' 1935 evaluation of the forests in the Great Lakes region, however, that the mixed coniferous and deciduous forests were accepted as a distinct floristic zone. The debate whether it is a floristic zone with definable boundaries (Braun 1950; Dice 1943; Potzger 1948) or a slow gradation from one type of community to another (Curtis 1971), however, continues. Regardless of which side of the debate one chooses to agree with, there is little argument that the forests of the Great Lakes region are transitional in character containing elements of more northern and more southern forest types (Hambacher 1987).

As recently noted by S. Branstner (1989:13-15), three basic schemes are used by archaeologists to classify the natural and cultural areas of the Upper Great Lakes region. The first scheme makes use of the concept of biotic provinces and zones of transition between them. Cleland (1966a) and Yarnell (1964) were the first to formally adopt the scheme developed by Dice (1943) and use it as a means to understand the cultural adaptations of the region. The second scheme was developed by Veatch (1959). Using the distribution of soil types and the General Land Office surveys of the state from the early nineteenth century, Veatch (1959) was able to reconstruct the presettlement forest associations present across the state. Albert et al. (1986) recently introduced a third system for classifying the environment. This system employs a total ecosystem approach, which provides a level of detail not present in the first scheme and aspects of physiography not present in the second scheme. One drawback to this approach, however, is the fact that it relies on the current vegetational structure of Michigan; a situation very different from that existing prior to the lumbering era.

All three schemes are used to varying extents in this study. Each offers its own advantages and has its own limitations. In this respect, Cleland's (1966a) study provides broad based generalizations and expectations for the region under consideration. The study presented by Albert et al. (1986) provides a level of detail about the structure of the ecosystem not available elsewhere. The structure of the presettlement forests, however, is considered only in a generalized fashion. Veatch's (1959) work is relied on for additional details concerning the composition of the presettlement forests.

Cleland's (1966a) examination of the correspondence between biotic provinces and the general structure of the prehistoric adaptations in the region is well known and continues to be an important integrative concept (Mason 1981). In this work, broad expectations for the cultural and economic adaptations to the major environmental zones were derived from the historic period cultural adaptations to the area. These expectations were then projected back through time to provide an explanation for the structure of the archaeological record. While this framework still remains viable and productive for research in the Upper Great Lakes (Hambacher 1987), it does not allow for a more specific evaluation of the environment (Branstner 1989:14).

Briefly, the region under consideration here falls entirely within the Carolinian-Canadian transition zone (Cleland 1966a) (Figure 5). Elements typical of both the Carolinian biotic province to the south and the Canadian biotic province to the north are found among the floristic and faunal communities (Cleland 1966a; Dice 1943). Stretching across the central part of Michigan, the size and shape of the transition zone varies from east to west. In the eastern half of the state the transition zone encompasses the Saginaw Valley with its large expanses of wetlands. Near the center of the state, the Carolinian-Canadian transition zone widens considerably and extends up the west coast of the state. The Traverse Corridor forms the northern end of the transition zone.

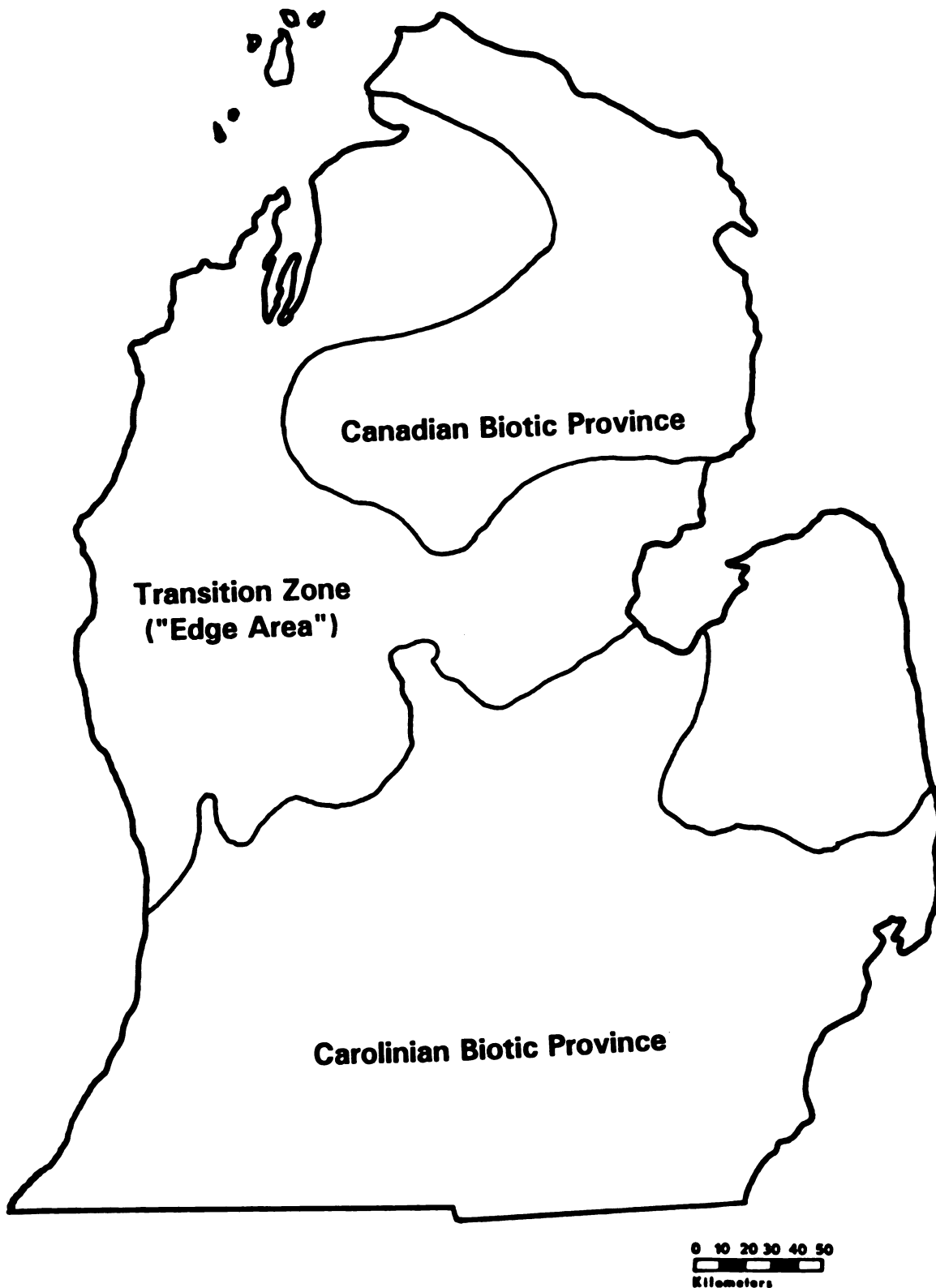


Figure 5. Major Biotic Provinces of Lower Michigan

In Regional Landscape Ecosystems of Michigan, Albert et al. (1986) provide a more detailed characterization of the environments present in the state. This study provides "a system that expresses the interactive character of landscape ecosystems and their components of climate, geological parent material, physiography (landform and water bodies), soil, plants and animals" (Albert et al. 1986:1). Three hierarchical levels, the region, district and subdistrict, comprise this classification system. Regions and districts are defined by aspects of macroclimate and physiography, while subdistricts are defined by a combination of physiography and soil associations (Albert et al. 1986:2-3). Vegetation patterns are used primarily to verify the location of boundaries.

The area considered in this study is located in Region II of lower Michigan and encompasses four districts (Highplains, Newaygo, Manistee, and Leelanau), several of which contain a number of subdistricts (Albert et al. 1986:8-9) (Figure 6). As noted by Albert et al. (1986:10), the boundary between Region I and Region II is arbitrary and is based on a combination of average climatic differences and physiographic features. It is not coincidental that this boundary roughly coincides with the southern limits of the Carolinian-Canadian transition zone.

Proceeding from southwest to northeast, the Highplains District (Figure 6) is divided into three subdistricts; Cadillac, Grayling, and Vanderbilt (Albert et al. 1986:19-20). Of these, only the first two subdistricts lie within the study area. These subdistricts comprise the interior highlands of Michigan. Because of its inland location, relatively high elevations, and northern latitude, this area exhibits the severest climate in the lower peninsula of Michigan. The climate of this district is highly variable and unpredictable, particularly during the fall and spring. Overall, the growing season is only about 115 days long and the area is subject to early and late freezes. Occasional midsummer frosts also occur. Some of the lakes in this district, such as Houghton and

Figure 6. Ecosystem Classification of Northern Michigan (after Albert et al. 1986:8-9)

Key:

- 1. Presque Isle District**
- 2. Leelanua District**
 - A. Traverse City Subdistrict**
 - B. Williamsburg Subdistrict**
- 3. Highplains District**
 - A. Vanderbil Subdistrict**
 - B. Grayling Subdistrict**
 - C. Cadillac Subdistrict**
- 4. Newaygo District**
- 5. Manistee District**
- 6. Arenac District**



Figure 6.

Higgins Lakes, are large enough to provide an ameliorating effect on the climate of the immediate area. Because of the diversity of the climatic regime in the High Plains district, physiographic characteristics define the subdistricts.

The Grayling subdistrict covers 10,580 square kilometers of area, or 48% of the High Plains District (Albert et al. 1986:20). It is composed of a high outwash plain lying between 1,050 and 1,300 feet (275 to 480 m) a.m.s.l. Large sand ridges forming the remnants of moraines are also present. Sand and gravel is the primary parent material for the soils of the region. While these soils tend to be well and excessively well drained, they are on occasion poorly drained. Additionally, clayey subsoils occur near the surface in some areas, particularly around Houghton and Higgins Lakes. This leads to perched water tables responsible for the extensive swamps and peat and muck deposits in this subdistrict (Albert et al. 1986:20). In Missaukee, Roscommon, and Clare counties, 20 to 30% of the land area is classified as swamp (Barnett 1988:28-35). Crawford and Otsego counties have only slightly smaller proportions of swampland. Incidentally, the headwaters of the Manistee and Muskegon Rivers also originate within this subdistrict.

Prior to nineteenth century lumbering activities, extensive stands of mixed pines and oaks covered much of the Grayling subdistrict (Veatch 1959) (Figure 7). Specifically, Norway, jack, and white pines along with white, black, red, and northern pin oaks predominated in the areas of well drained and excessively well drained sandy soils (Albert et al. 1986:20; Veatch 1959). Poorly drained soils supported a different range of species, including spruce, cedar, tamarack, elm, ash, aspens, basswood, birches, red maple, sugar maple, firs, willows, and alders (Veatch 1959). The specific combinations of tree species and their relative percentages are highly variable, especially in areas such as the central portion of Missaukee County where the distribution of well and poorly drained soils and their associated floral communities is

Figure 7. Presettlement Forests of Western Michigan (after Veatch 1959)

Key to Forest Types:

1. Norway, jack, white pines; black, white, red, jack oaks; aspen; red maple.
2. Sugar maple; yellow birch; hemlock; white pine (rarely Norway); red oak.
3. Oaks-white pine; aspen; red maple.
4. Oaks-white pine; small amounts of sugar maple, beech, yellow birch; hemlock; hickory, walnut infrequent.
5. Norway, white pine; Oaks; sugar maple; beech; basswood; elm; aspen; red maple.
6. White pine (less Norway); high proportion mixed deciduous and coniferous; fir; spruce; cedar.
7. White pine; mixed elm, basswood, ash, aspen; less sugar maple-beech.
8. Sugar maple, elm, basswood, ash; small to large amounts yellow birch, hemlock, white pine; hickory, walnut, oaks in small amounts or absent.
9. Oaks; great diversity of both deciduous and coniferous trees; mainly sand dunes.
10. Sugar maple-beech; oak-hickory; elm, basswood, ash.
11. Elm; red maple; ash; aspen; yellow and white birch; cedar; spruce; hemlock; white pine.
12. White and Norway pines (less jack), oaks; mixed aspen, spruce, fir, cedar, tamarack, elm, ash, red maple, white and yellow birch.
13. Wet land deciduous species as in 11 and 19 with more conifers.
14. Spruce, cedar, tamarack, fir; elm, ash, red maple, aspen: white pine common.
15. Elm, ash, red maple, aspen, balsam poplar; conifers common.
16. Dry prairies; scattered bur oak; marsh; mainly clumps of oaks, aspen, willow, tamarack.
17. Elm; silver maple; ash; swamp white oak; basswood; shagbark hickory; sycamore; cottonwood; red oak; bur oak.
18. Oaks-white pine; diversity of other species.
19. Elm; ash; red maple; basswood; yellow birch; aspen; fir; spruce; hemlock; white pine.



Figure 7.

highly patchy with hydrophytic, xerophytic, and mesophytic species occurring in close proximity to one another.

The Cadillac subdistrict is primarily composed of coarse textured end moraines ranging between 850 and 1,725 feet (260 to 525 m) a.m.s.l. (Albert et al. 1986:20). The topography in this region is hilly with some gently sloping areas and expanses of outwash plain. This subdistrict is differentiated from the districts lying to the west by relatively higher morainic ridges. Flowing through the largest outwash plain in the area, the Muskegon River forms the primary drainage system for the Cadillac subdistrict. With the exception of the river drainages, the soils tend to be well drained, even in low lying areas due to the extremely thick sand and gravel deposits left behind by the glaciers. Areas of poorly drained and swamp soils tend to be located along the main stream drainages.

Mixed oak and pine forests formerly predominated in the Cadillac subdistrict (Veatch 1959) (Figure 7). The relative frequency of hardwoods once present in this area exceeded that of the Grayling subdistrict. Thus, extensive stands of sugar maple, yellow birch, hemlock, and a variety of oaks intermixed with white pines were common (Veatch 1959). Extensive communities of trees typically associated with poorly drained areas were common along the edges of the river systems, particularly the Muskegon River (Albert et al. 1986:20). A few of the species found in these low lying areas include spruce, cedar, tamarack, aspen, and red maple.

The Newaygo District (Figure 6) is located west of the Highplains District, between the base of Grand Traverse Bay and the Muskegon River (Albert et al. 1986:20-21). This district is a relatively narrow region of outwash plains varying between two and 25 miles (3 to 40 km) wide. Elevations range between 700 and 1,210 feet (215 to 370 m) a.m.s.l., gradually decreasing in elevation from east to west. Isolated and discontinuous areas of dissected end moraine are also present. Soils in the district tend to be excessively well drained sand and gravel on both the outwash plains

and the morainic hills. The climate of this district is described as intermediate between the Highplains District to the east and the Manistee District to the west (Albert et al. 1986:20). The growing season is longer than in the area to the east, averaging 126 frost free days. This places the district just within the range of the number of frost free days necessary for successful prehistoric agriculture (Yarnell 1964). However, the potential for late freezes is relatively high, adding an element of unpredictability to the climate.

The structure of the presettlement forest communities in the Newaygo District continues to be a mix of northern hardwoods and coniferous species (Figure 7). Stands of sugar maples and beeches with substantial numbers of white pine intermixed were quite common (Veatch 1959; Albert et al. 1986:20-21). As in the regions to the east, the edges of the numerous streams crossing the district supported stands of northern white cedar, white pine, balsam firs, and aspens.

The Manistee District (Albert et al. 1986:21) is also a narrow belt of end moraine and sand lake plain extending along the west coast of Michigan between the Muskegon River and the southern end of Leelanau County (Figure 6). Elevations range between 580 feet (180 m) along the lake shore to 1,150 feet (360 m) a.m.s.l. in some areas. Tall bluffs composed of morainic deposits capped by sand dunes rise abruptly along the shoreline, particularly in the area just south of the Manistee River northward to the Leelanau Peninsula. The dune systems present in the Nordhouse Dunes, Manistee National Forest and the Sleeping Bear Dunes National Lakeshore are typical for the area. These barrier dunes and morainic deposits are periodically pierced by the mouths of the Muskegon, White, Pere Marquette, Big Sable and Manistee Rivers which terminate in the form of drowned embayments. Such drowned embayments also occur at the mouths of a number of smaller drainages emptying into Lake Michigan at Onekama, Arcadia, and Frankfort, Michigan. Behind the dunes, expanses of former lake bed are present in the area between the cities of Manistee and Ludington. Further

south, gently sloping ground and end moraines composed of finer textured soils predominate.

Soils in the Manistee District tend to be well drained except in areas of former lake bed. In these areas, patchy wet depressions and droughty beach ridges are typical. The climate of the Manistee District is milder due to the ameliorating influence of Lake Michigan. As a result, the growing season extends up to 140 frost free days in length. Although the growing season is longer, Albert et al. (1986:21) notes that overall temperatures are not significantly higher than those for the Newaygo District to the east. Precipitation is relatively uniform throughout the year with the addition of lake-effect rain and snow in the fall and winter.

The mixed northern hardwood and coniferous forest communities common throughout the other districts and subdistricts continue to characterize the presettlement forests in the Manistee District (Veatch 1959; Albert et al. 1986:21) (Figure 7). Thus, a mixture of beech, maple, hemlock, balsam fir and some white pine could be expected to have occurred on the medium and coarse textured morainic hills and bluffs north of Manistee, Michigan. The sand plains south of Manistee would have supported a more diverse mixture of forest species (Veatch 1959). Red maple, paper birch, trembling aspen, and shrub willows were present in the more poorly drained areas, while a variety of maples, oaks, and white pine could be found on the drier sand ridges. Small patches of forests containing minor amounts of hickory scattered across the southern part of Oceana County and the northern part of Muskegon County are also indicated by Veatch (1959).

The final district included in the study area is the Leelanau District, located in a narrow arc around Grand Traverse Bay (Albert et al. 1986:21-22) (Figure 6). This district is subdivided into two subdistricts; Williamsburg and Traverse City. The former subdistrict consists of coarse textured end moraines ranging in elevation between 750 and 1,220 feet (230 to 370 m) a.m.s.l. wedged between drumlin fields to

the north and outwash plains to the south. The eastern portion of the Traverse City Subdistrict is synonymous with the Traverse Corridor (Cleland 1967a, 1967b; Lovis 1973). This narrow littoral zone is distinguished from the surrounding districts by extensive drumlin fields and moderate to steep slopes with elevations ranging between 580 and 1,095 feet (180 to 335 m) a.m.s.l. Soils are almost uniformly well drained, except for small areas of swamp in depressions and around some of the inland lakes.

The forest communities present in the Leelanau District are largely an extension of the mixed northern hardwoods and coniferous species found to the south in the Newaygo and Manistee Districts (Isleib n.d.; Veatch 1959) (Figure 7). Interestingly, and of relevance to the Skegemog Point site, is the fact that both Veatch (1959) and Isleib (n.d.) indicate the presence of extensive areas of cedar, tamarack, and hemlock with minor components of spruce, fir, black ash, elder, and white pine occurring around the southern end of Elk Lake and Lake Skegemog. This area is, in turn, ringed by a zone dominated by a mixture of white and red pines and white and black oak. This latter forest configuration dominates the peninsula on which the Skegemog Point site is located.

In addition to the trees comprising the forest communities, a variety of herbaceous plants and grasses also occurred in a number of areas. In the dunal areas along the coast, plants such as beachgrass, bearberry, and juniper would have been typical members of the floral communities. Cattails, water lily and a variety of reeds such as hardstem bullrush would have been common along the marshy edges of lakes (Curtis 1971; Egan, personal communication 1988; Veatch 1959). A wide range of berries, such as choke cherry, blueberry, raspberry, and wild grape could have been found in the open climax forests and areas of disturbed ground (Yarnell 1964). Finally, a number of small prairies formerly existed in central Newaygo County (Hinsdale 1932).

An extensive variety of animal species could be found cross-cutting each of the ecosystems. Cleland (1966a:224-246, 253-274) has presented an extensive summary of the animal species which would have been available in these forest, swamp and marsh communities. Briefly, the interior and upland moraines would have provided suitable habitats for a variety of large and medium sized mammals including deer, raccoon, squirrels, rabbits, bear, red fox, bobcat and lynx, and ruffed grouse (Baker 1983; Burt 1954). The swamp and marsh communities, on the other hand, would have included animals such as otter, mink, fisher and other Mustelids, muskrat, beaver, a variety of turtles, along with a wide variety of marsh birds such as ducks and geese (Baker 1983, Smith, personal communication cited in Hambacher 1988).

As noted above, the region under study not only is characterized by the transitional nature of the forest communities, but also by an abundance of water resources in the form of many inland lakes, swamps and marshes, rivers and streams, and, of course, Lake Michigan. Virtually all of the study area lies beyond the southern limits of the inland shore fishery (Cleland 1982; Rostlund 1952). Only Grand Traverse Bay lies within the currently defined limits of the fishery. This is primarily because the bottom configuration of Lake Michigan south of Grand Traverse Bay lacks the proper depths and offshore shoals required by the fall spawning fish forming the focus of the inland shore fishery (Cleland 1982; Martin 1985, 1989). Unlike the area to the north, the bottom of Lake Michigan drops off rapidly from the shore and gravel shoals do not occur. Depths in excess of 60 feet or 10 fathoms typically occur within two or three miles from the shore. It is not unusual for bottom depths to exceed 300 feet less than five miles from the shore.

Although Lake Michigan does not appear to have offered attractive opportunities for intensive fishing prehistorically, the numerous inland lakes and shallow embayments along the Lake Michigan coast do provide situations suitable for the exploitation of fish populations. A variety of species including bluegill, perch,

crappie, bullhead, sucker, drum, and bass would have been available throughout the year in embayments such as Arcadia Lake (Hambacher 1988) and shallow inland lakes such as Lake Skegemog (Cleland n.d.a.). The abundance and variety of fish available in these habitats continue to be a primary draw for fishermen in northern Michigan to this day.

While the west central portion of Michigan may not have exhibited the tremendous abundance and density of resources found in more southern climes, it did offer a unique set of resources. The lower density of floral and faunal resources was, in part, offset by the diversity of resources created by the mixture of species typical of more southern and more northern environmental situations. Furthermore, due to the variations in both elevation and soil conditions resulting from glacial action, different configurations of the floral and faunal communities quite frequently occur in close proximity to one another. Thus, by positioning themselves in any number of strategic locales such as Skegemog Point in Grand Traverse County, the Aetna and Boven earthworks in Missaukee County, the Point Arcadia site in Manistee County, and the Porter Creek site in Mason County, the Late Woodland populations of west central Michigan were able to take full advantage of the resource options offered to them by the regional ecosystems.

Covering nearly 9000 square miles of area the Carolinian-Canadian transition zone in western Michigan is a distinct and geographically expansive environmental zone. While the general carrying capacity of the region may be lower than in more southern areas, a wide variety of natural resources were available. The combination of physiographic, climatic, geologic and other factors act to create a patchy environment where a range of micro-environments are located within close proximity of one another (Figure 7). The region also lies within the range of frost free days necessary for effective corn agriculture. In the succeeding sections of this study aspects of ceramic design variability are used to argue that a distinct cultural adaptation to this environment

is in place by the beginning of the Late Woodland period. The potential for social boundaries within the region and shifts in the primary directions of interaction are also explored.

CHAPTER 2

THE PERSPECTIVE

THEORETICAL PERSPECTIVE

Ceramics are one of the most common artifact types in the archaeological record. The durability and state of preservation of ceramics is exceeded only by stone tools and the associated manufacturing debris. Throughout history, from Renaissance antiquarianism to modern processual archaeology, ceramics have been a favored avenue of inquiry (Rice 1987). This is primarily due to the fact that ceramic manufacture is an additive process using a highly malleable raw material. As Rice (1987:25) noted, because pottery is formed and informed, it retains evidence of the manufacturing process in the final product. This, in turn, provides insights into the nature of the behaviors and decision making processes involved in its manufacture and use.

While it would be naive to view ceramics, or any item of material culture for that matter, as a direct reflection of a society, they are nonetheless a result of the handiwork of the members of any given cultural system. As such, these objects pass through a series of culturally conditioned decisions that ultimately determine the item's final shape and appearance. The specific ways in which a cultural system influences this process, however, can be expected to vary from system to system (cf. Hodder 1982, 1987). An assumption of patterning in human behavior constrained by cultural dictums is crucial to elevating anthropological archaeology above the level of particularistic and purely descriptive study. The concept of style is one avenue by which this process proceeds. Because of its relative sensitivity to cultural processes, the

study of ceramic style is one of the favored means for examining the structure and interrelationships of prehistoric societies across space and time.

Stylistic studies utilizing a wide range of archaeologically and ethnographically derived artifacts abound in the literature (Boas 1955; Bunzel 1929; Conkey 1978; Fenton 1956; Friedrich 1970; Leroi-Gourhan 1968; Plog 1980; Sackett 1982; Wiessner 1983, 1984). It must be remembered that ceramics, like many other items of material culture, are implements which function within specific contexts, for specific purposes; they are not just vehicles for decoration (Braun 1983). While stylistic studies have been conducted for quite some time, the success in deriving social information has been limited due to the lack of a unifying body of theory (Wiessner 1984:190-191). As noted above, ceramics have provided the most fertile area for stylistic studies and it is in this context that a majority of the advances in the study of stylistic behavior have taken place.

The development of current theoretical schools of thought concerned with the analysis and interpretation of stylistic variability and its application to archaeological data has been detailed in several articles (Braun 1977; Plog 1977, 1980). Since the perspective used in this study is firmly rooted in these theoretical schools, a brief review is helpful. Braun (1977:112) identified three general models which have been used in the study of style; arts and leisure, social interaction, and information exchange. The first model relates the degree of decorative elaboration with the level of cultural complexity as indicated by the amount of leisure time available to society members (Braun 1977:112-113). This model holds little credence today. The other two perspectives, however, continue to be a central focus of current ceramic stylistic studies at both the theoretical and the practical levels.

The social interaction theory was the first of the main theoretical schools to develop. Its origin can be traced back to the pioneering work of Deetz (1965), Longacre (1964, 1970), and Whallon (1968). The belief that decorative behavior is

normative forms the basic assumption of this perspective (Braun 1977:114). As such, the distribution of decorative design elements across a region is seen as a direct function of the structure (i.e., intensity and frequency) of interaction among the producers of a particular artifact set, such as ceramic vessels. It is further assumed that the patterning in design variability directly reflects aspects of social organization since it is along these lines that social intercourse usually takes place (Voss 1982:40). This potentially allows the identification of such structures as residential groups, sodalities, political alliances, and exchange networks.

Application of this perspective to archaeological situations has taken place at both inter- and intra-community levels. At both levels of analysis, it has been considered an adequate explanatory device for the observed patterns of design variability. At the intra-community level of analysis, Longacre (1964, 1970) and Hill (1970) used a social interaction model to interpret localized clusters of rooms at the Broken K and Carter Ranch pueblos. Statistically measured similarities in the distribution of design elements was used to define the room clusters. These room clusters were, in turn, interpreted as representing matrilineal residence units. Expanding on this research, several authors applied this method to examination of groups of communities (Cook 1970; Longacre 1964; Tuggle 1970). The observed patterns were interpreted as indicating the degree of interaction between communities in terms of intermarriage as well as economic and religious ties. Plog (1977:336) has noted that there was little explanation for the basis of the inferential leaps in these studies.

Also working at the community level of analysis, Deetz (1965) sought to document the shift from matrilineal to patrilineal residence patterns among the Arikara. The focus of this study was the Medicine Crow site, dating between A.D. 1690 and A.D. 1780. In this case, the association of stylistic attributes and the manner in which associated attributes shifted through time was examined (Deetz 1965:45-82). The

resultant patterns lead Deetz (1965:96-100) to conclude that they were indeed related to changes in the social organization among the Arikara.

In similar studies using data from the New York Iroquois, Whallon (1968) and Engelbrecht (1974) looked at the degree of within site and regional homogeneity in the distribution of design attributes through time. The working assumption developed by Whallon (1968:240) indicated that the degree of integration and intensity of interaction would be reflected in the degree of homogeneity in the regional distribution of design elements. A higher level of design homogeneity would be the result of increased levels of interaction between communities. That is, as the type and complexity of the social linkages between groups increases, the degree of similarity in the structure of each groups material culture should also show an increase.

Some degree of support for the interaction model was also found in ethnographic studies conducted by Bunzel (1929), Friedrich (1970), and Stanislawski (1973). Although these studies cast doubts on the reflection of post-marital residence groups in the spatial distribution of ceramic design sets, they did provide general support for the social interactionist perspective. Simply put, the closer people are and the more they interact with one another, the more opportunity there is for the diffusion of design elements or motifs.

The direct linkage between the degree of stylistic similarity and the size and structure of kin groups was disputed by Allen and Richardson (1971). Bunzel (1929), and particularly Friedrich (1970) indicated that similarity among formally recognized design structures is highest among the ceramic manufacturing task group. The membership of these task groups frequently cross-cuts lines of kinship. The important point is that the task group does reflect a unit of close social interaction. Thus, although reconstruction of specific kinship groups may not be possible as argued by Allen and Richardson (1971), it does not rule out the identification of cooperative groups of people linked by non-kin based ties.

Eventually, the basic assumption that sees decorative behavior as normative behavior and the emphasis on style as a passive reflector of the social order became viewed as the primary weakness of the social interaction model (Braun 1977:122-123). The information exchange model as articulated by Wobst (1977) was developed to overcome these shortcomings. Under this perspective, style is viewed as a "multidimensional and surprisingly dynamic phenomenon" (Wobst 1977:335) which has a clearly functional role in cultural systems. Furthermore, the definition of style is restricted to those aspects of formal variability in artifacts suitable to the transmission of information between social units (Wobst 1977:321). The functional role of style, thus, becomes explicit. Because of the "cost" of encoding information on artifacts, the message must be fixed and invariant (Wobst 1977:322-323). Thus, the type of messages suitable for such transmission will be relatively constrained, standardized, and simple in nature. Types of information suitable for such transmission include "emotional state, identification (class affinity, social group affiliation, and position along ranked scale), authorship and ownership, objectification, and deictic messages" (Wobst 1977:323). Groups of intermediate social distance are identified as the primary targets of such encoded messages. They are defined as those who are not so close that the information would already be known or more easily transmitted by other means, but not so distant so as to prevent proper interpretation of the encoded message (Wobst 1977:324-325). Obviously, to be effective, the conveyer of the stylistic information must have a relatively high degree of social visibility (Voss 1982:42). Under this model it is expected that as the size and complexity of social networks increase, a concomitant increase will also be seen in the structure of the stylistic behavior (Voss 1982:41-42).

Stylistic messages of this sort serve to summarize an individual's social and economic situation in terms of his or her relative position within their own cultural system and to those outside of that milieu (Wobst 1977:327-328). Because they are a form of visual communication, stylistic messages set up patterns of expected behaviors

between individuals prior to an encounter. This serves to ease the process of initiating social interaction between individuals. In turn, the process of integration among social groups is facilitated while maintaining social differentiation between individuals (Wobst 1977:327-328).

Wobst (1977:328-330) concludes that items which are seen only by a small number of people will exhibit clinal distributions of specific stylistic forms within and across social units. On the other hand, those which are most widely broadcast and play a role in boundary maintenance will exhibit stylistic forms specific to that group. Correspondence between certain aspects of style and various levels of social differentiation is implied. The ethnic group (Barth 1969) is one level of social differentiation which has the potential to be identified.

Archaeological tests of this model have taken place using data from the Valley of Oaxaca in Mexico, the American Southwest (Plog 1976, 1977, 1980), and the Middle to Late Woodland transition in Illinois (Braun 1977). In all three cases, the expectations of the information exchange model provided a better fit to the observed patterns of stylistic variability than did the social interaction model. These patterns basically involve an increase in stylistic homogeneity across the respective regions during the time periods under consideration (Braun 1977; Plog 1980). In a later article, Braun and Plog (1982) tie this process in with increased levels of population density and intensification of local subsistence practices. The associated increase in social and economic risks with these processes, in turn, prompt extension of formal social networks as a buffering mechanism associated with the development of tribal society (Braun and Plog 1982:518).

In contrast to a total rejection of the social interaction model advocated by Plog (1980), Voss (1982) took initial steps towards formulating a fusion of these two seemingly disparate models. Rather than viewing the models as mutually exclusive and competing explanatory systems, both are considered necessary to adequately explain the

stylistic variability seen in the archaeological record (Voss 1982:46). The concept of individual or self identity is the focal point which makes this fusion possible. Thus, social interaction and information exchange are subsumed as two aspects of a single process (Voss 1982:46). As summarized by Voss (1982:45):

The identity process is a circular process involving the individual and the social environment. An individual's behavior, strongly influenced by identity, is directed towards others in the social environment. The responses of others and the perceptions of such responses by the individual provide crucial feedback for the maintenance of self-concept or for identity change. The formation of personal identity and its impact upon behavior result in a dynamic process linking the individual with the larger social environment.

Since identity forms in the context of a person's social environment, it is an interactive process. Also, since a person's perception of one's identity can be expected to be communicated to those around the person, it is also a process of information exchange. Stylistic behavior is one avenue through which these processes physically manifest themselves.

Wiessner (1983, 1984) also attempted to merge the social interaction and information exchange models into a unified model by asserting that style is a behaviorally based embodiment of the process of personal and social identification. Two aspects of style are defined: emblematic and assertive (Wiessner 1983:257). Emblematic style is represented by the "formal variation in material culture that has a distinct referent and transmits a clear message to a defined target population" (Wiessner 1983:257). In this fashion it communicates information about group affiliation and social group boundaries. In contrast, assertive style is the "formal variation of material culture which is personally based and which carries information supporting individual identity" (Wiessner 1983:258). Because assertive style has no direct referent and only supports identity it is more open to diffusion through lines of interpersonal interaction. Voss and Young (1989), however, indicate that there is, in fact, a referent population

for assertive style; the small social group. The indefinite nature of the line differentiating these two aspects of style is recognized (Wiessner 1983:259). In fact, both may occur on a single artifact, or the role of a specific design structure or element may change with changing social conditions such as in times of stress or competition. This represents a major departure from earlier studies which often sought invariate, a priori rules for artifact styles which would allow their interpretation as direct reflectors of the social order.

In both Voss' (1982) consideration of Western European Neolithic pottery and Wiessner's (1983, 1984) study of Kalahari San projectile points and headbands, no a priori means of identifying which design elements will be a product of which aspect of style were found. This does not, however, mean that Hodder's (1982) contention that the distribution of design elements and structures can only be understood through emic, structural analysis of particular elements within their historical contexts is correct. Rather, design elements with high visibility are seen as part of formal design structures (emblemic style), while those with lower visibility are considered reflective of social interaction (assertive style) (Voss 1982:46). Thus, in the former case, design elements are expected to display a discrete distribution. In the latter case, design elements are expected to display a clinal or continuous distribution depending on conditions of function, suitability for carrying messages, ease of design replication, and artifact density within the population (Voss 1982:46; Wiessner 1983:258-259).

Following the lead of Voss (1982) and Wiessner (1983, 1984), Carr (1985a, 1985b) formally proposed a synthetic theory of artifact design. It is argued that any general theory of artifact design must encompass all aspects of morphological and decorative variability, not just those considered to be stylistic in character (Carr 1985b:7). Furthermore, attributes composing the design of an artifact are viewed as existing in a hierarchical fashion where their occurrence at different levels of the hierarchy is a product of potentially different processes. Thus, they may have different

meanings reflective of aspects of function, technology, the design norms of social groups, and/or idiosyncratic behaviors manifested as aspects of self-image or motor habits (Carr 1985b:6-7).

As Voss and Young (1989:28) point out, behavioral processes organized in a hierarchical fashion in relation to formal attributes form the core of Carr's synthetic theory. These behavioral processes, in turn, are constrained not only by aspects of technology and raw material, but also by aspects of the self. These include "active signaling of cultural affiliation, social identities, social roles, and personal image; and passive reflections of social affiliation and individuality" (Voss and Young 1989:28). The hierarchy of behavioral processes is summarized by four reference hierarchies. Once again, quoting Voss and Young (1989:28), these reference hierarchies and their utility are:

a hierarchy of manufacturing decisions, one of execution steps, one of attribute visibility, and a hierarchy of the spatial distribution of attribute states. The four reference hierarchies correlate with each other and, in combination, allow the researcher to assign potential [emphasis added] behavioral meanings to artifact attributes.

Even with the explicit definition of the hierarchical relationships between behavioral processes and the position of an attribute in the hierarchy, direct prediction of the form which any stylistic behavior will take is not possible in the fashion envisioned by Wobst (1977). This is because the relationships between the reference hierarchies and specific behavioral processes are overlapping and multiple; they are not mutually exclusive sets (Voss and Young 1989:28).

Carr and Rosenthal (1986) have identified four sources of indeterminacy in the assignation of meaning to design attributes. The first source of indeterminacy is the linkage between an increase in visibility and the range of potential meaning reflected in the decorative behavior (Carr and Rosenthal 1986:3). The second source of

indeterminacy stems from social processes involving conscious choice and manipulation of a design attribute as an indicator of social boundedness or as an indicator of within-group solidarity and cooperation, as well as a more passive process of attribute choice resulting from enculturation processes (Carr and Rosenthal 1986:4-5). Referring only to the symbolization of group affiliation and social boundaries, the third indeterminacy is a result of the spatial context in which messaging takes place (Carr and Rosenthal 1986:5). To exemplify the extremes of this indeterminacy, Carr and Rosenthal (1986:5-6) use the case of Wobst's (1977) study of Yugoslavian hat styles for messages signaled at great distance and Trigger's (1969) description of the Huron Feast of the Dead for short distance messaging. The fourth cause of indeterminacy is cross-cultural in character. It is seen as a result of the importance of messages varying across cultures and contexts (Carr and Rosenthal 1986:6). Finally, it is concluded that stylistic variation should be viewed as a case of constrained indeterminacy. This parallels Voss and Young's (1989:30) conclusion that "the self is built upon constrained individuality."

Drawing on both social psychological and anthropological literature, Voss and Young (1989) conducted an in-depth consideration and evaluation of the self as a means to enhance the ability to derive social information from stylistic behavior. Not surprisingly, they found the interrelations between behavioral meaning and physical attributes to be much more complicated than indicated in initial studies by Voss (1982) and Wiessner (1983, 1984). On the positive side, they did find systematic relationships between behavior and attributes of design and that the concept of re-creation developed by performance theorists provides a means to explicate these relationships (Voss and Young 1989:39-40).

Briefly, the process of re-creation is a part of expressive behavior involving the two dimensions of the self; reactive and proactive (Voss and Young 1989:39). The reactive dimension is the result of the intersection of the individual with their social

group; it is the aspect of self-concept (Voss and Young 1986:4- 5). In contrast, the proactive dimension involves the presentation of one's self in terms of social contexts and social roles (Voss and Young 1989:6). Thus,

as an act of re-creation, stylistic behaviors contingent on a number of factors, including general (sociocultural) and specific (interpersonal) reference relationships, the abstract values and ideals which guide behavior, the motivation for a specific act of expressive behavior, and individual competency (Voss and Young 1989:39-41).

In order to operationalize their model of stylistic behavior, Voss and Young (1989:41-44) identify two attribute characteristics critical to the assignment of behavioral meaning: distribution and visibility. The distributional implications were first stated by Voss (1982:74) in the form of two test implications. The first involves discrete design features in the form of decorative elements. Those elements which are part of a formally recognized design structure may be expected to exhibit relatively homogeneous distributions. Conversely, those which are not should tend towards clinal distributions within a region or a site only if regular interaction occurs among the members of the reference population (Voss 1982:74). The second test implication relates to continuous attributes and predicts that similar patterns to those seen with discrete attributes should be seen. However, these "nuances of style" generally do not function as conveyers of information per se. Because of this, they are more sensitive as indicators of levels of social interaction than social messaging (Voss 1982:74). Carr (1985b:22) also indicates that the interpretation of the geographic distributions of design attributes should be compared against known distributions of similar attributes from comparable ethnographic instances.

Visibility is the second attribute characteristic important in assigning behavioral meaning. As indicated by Wobst (1977), the design attributes must be visible to the target population, whatever level of social boundedness is involved, in order for it to

effectively convey information. The definition of attribute visibility relies on overall size, the number of attributes, the degree of contrast between the attribute and its background, alternate attribute states, and its decipherability (Carr 1985b:16). In turn, the visibility of an attribute within a group will be a product of the prevalence of the artifact across space, the social context of its use, and the expected life span of that particular artifact class (Carr 1985b:16).

Using the characteristics of distribution and visibility, Voss and Young (1989:44-49) developed a series of six expectations for the interpretation of regional design attribute patterning. Attribute distributions are characterized as uniform, clinal, or random and the visibility of attributes as either high or low. These six patterns form the framework within which patterns observed in archaeological data may be interpreted and the distribution of attributes given social meaning in the study of social group interaction. A summary of each of the six expectations follows.

The first pattern consists of high-visibility attributes with uniform distributions (Voss and Young 1989:45). This pattern is very general. As a result, only general levels of interpretation are indicated. Essentially, this pattern reflects the spatial extent of the social or cultural system. Attributes displaying this pattern may be the product of either passive enculturation or the product of emblematic style and contain general symbolic meaning.

High-visibility attributes with a clinal distribution form the second pattern (Voss and Young 1989:45-46). Since high visibility attributes are typically associated with emblematic style and clinal distributions are generally associated with assertive style, this pattern appears contradictory. However, this pattern was observed by Voss (1982:76-77) in the distribution of Neolithic pottery design attributes. The presence of a significant social boundary with little movement of specific design elements and their associated meaning across the boundary explains this situation.

The third pattern consists of high-visibility attributes with a random distribution (Voss and Young 1989:46-47). The apparent contradictory nature of this pattern is also noted. Two potential interpretations are offered for this pattern. The first is behavioral and the second is methodological. The behavioral interpretation involves the exercise of "artistic license" as it relates to the manipulation of design elements in the modification and creation of new styles. As such, this pattern may help identify occurrences of culture change. The methodological interpretation involves the incorrect assessment of attribute visibility. Succinctly put, an attribute which is highly visible at one level of social groupings need not necessarily be so at all levels of social groupings from small (domestic) to large (regional).

Low-visibility attributes with uniform distributions form the fourth pattern (Voss and Young 1989:47-48). Three interpretations of this pattern are offered. The first involves the communication of within group cooperation, interaction, and solidarity. This situation was recognized by Carr and Rosenthal (1986:5) as a phenomenon associated with the existence of horizontal lines of integration such as sodalities. Since interaction usually takes place at short distances in these circumstances, highly visible attributes are not required. The second interpretation attributes the pattern to small group interaction and a less conscious use of style in the sense implied by Sackett's (1982) isochrestic concept of style. The third interpretation is a methodological by-product of coding a clinally distributed attribute as a two state variable (Carr 1985b:21).

The fifth pattern is very specific in its interpretation consisting of low-visibility attributes with clinal distributions (Voss and Young 1989:48). It is purely a product of interaction patterns among small social groups.

The final pattern is represented by low-visibility attributes with random distributions (Voss and Young 1989:48-49). As with the third pattern, this pattern may be an indication of creativity. It may also reflect individual competence in the execution

of the decorative attribute (i.e. motor habits) or idiosyncratic behaviors (Hill and Gunn 1977).

As with any interpretive framework, this series of expectations is not suited to cookbook-like applications. Several non-stylistic factors must be controlled or accounted for (Voss and Young 1989:49-50). First are the constraints on design exercised by aspects of raw material, technology, and artifact function (Voss and Young 1989:49). Second, taphonomic factors affecting the formation of the archaeological record (Schiffer 1976, 1982) must be taken into consideration (Voss and Young 1989:49-50). These include both natural and cultural processes affecting the distribution and preservation of artifactual remains. In the latter group are aspects such as functional variability among sites, variations in artifact functions, changing discard patterns, and the multi-component nature of many archaeological sites. Finally, care must also be taken in the coding phase of the analysis so that all relevant attributes are considered (Voss and Young 1989:50).

In a closely related recent article, Stevenson (1987) examined the processes through which identity signaling social groups can be expected to form. The ultimate target of this study is dispersed, mobile egalitarian-based social groups. These groups are viewed as the base from which more complex non-egalitarian groups ultimately evolved. As such, they should provide the clearest information concerning the evolution of stylistic behavior as a means of conveying messages about social group affiliation (Stevenson 1987:269). A key element of Stevenson's (1987:271-274) view is the concept that ethnicity is not a rigidly defined phenomenon. Rather, in keeping with recent trends in ethnicity studies (Cohen 1974; McGuire 1982; Royce 1982), the focus is on identity conscious social groups. An identity conscious group is "a reference group invoked by a people who share a common historical style...and who, through the process of interaction with others, identify themselves as sharing that style" (Royce 1982: 18, 27 as cited in Stevenson 1987:272). The emphasis is on social groups as

dynamic entities that exist and operate within a context of interaction. While identity conscious social groups have the potential to become distinct "ethnic units", it does not necessarily follow.

Using two early twentieth century gold rush communities in the Yukon as an example, it is argued that interaction between groups is a crucial factor in the development of identity conscious social groups that signal this membership through stylistic behaviors (Stevenson 1987:293). When otherwise dispersed social groups aggregate, an emphasis is placed on signaling group identity since identification of the participants generally occurs through comparison. As initially discussed by Wobst (1977), the ability to identify social group affiliation among interacting groups helps to structure the nature of the interaction and lends a degree of predictability to the process of social intercourse. In fact, without the ability to identify the appropriate rules which govern all social interactions, such interaction would be very difficult or impossible. As stated by Stevenson (1987:293), "the formation and accentuation of social group identity in intergroup interactions serves to structure social relations on two levels: within groups and between groups."

In sum, the concept of stylistic behavior developed by Voss and Young (1989) and others (Stevenson 1987; Wiessner 1983, 1984; Wobst 1977) offers great hope for a better understanding of how the patterns of decorative design elements observed in the archaeological record are created. This holistic perspective, by combining what have been useful but seemingly opposing schools of thought, takes advantage of each of their strong points. By unifying them, it also serves to alleviate some of the problems and criticisms experienced in the social interaction and information exchange models when they were applied separately from one another. It also stands as a clear example of the manner in which progress is made in the development of a body of explanatory theory.

In the case of the Upper Great Lakes, these advances offer great hope for gaining a better understanding of some of the aspects of ceramic design structure and

distribution which have plagued archaeologists for the last half a century. Namely, how to better interpret and understand the shifts from the generalized, clinal distribution of decorative attributes seen on early Late Woodland wares, such as Mackinac, Skegemog, Spring Creek, Wayne, Allegan, and Bowerman, to the more regionally constrained types of the late Late Woodland exemplified by Juntunen, Traverse, Moccasin Bluff, Macomb and other wares. Whether reinterpretation of the current models are required or not, it is minimally expected that a fuller understanding of the dynamic social processes occurring during the nearly 800 year span of the Late Woodland period will be obtained. Before turning to the analysis of the ceramics from the Skegemog Point site, it is first necessary to discuss the view of ceramic vessels and their decorative content taken in this study.

ANALYTIC PERSPECTIVE AND BACKGROUND

The analysis of the ceramic vessels from the Skegemog Point site discussed in the following section has two purposes. The first purpose relates to typological and classificatory needs. The second purpose relates to the examination of the stylistic content of the vessels as it pertains to sociological concerns. While both of these goals hold common analytic needs, each one also has analytic needs which are not necessarily germane to each other.

The typological and classificatory concerns are oriented towards creating a series of archaeologically relevant ceramic types. These types are most accurately viewed as analytic constructs, rather than true "emic" types. It is through the examination of the observed patterning of the attributes used to characterize the form and decorative content of ceramic vessels that cultural inferences are drawn. The primary object is to arrive at a more refined understanding of the nature of the systematic variation among the attributes occurring at the Skegemog Point site and

across the study area. This task was accomplished through the application of methods of numerical taxonomic analysis to the data set (see Chapter 3).

Exploration of the stylistic variation represented among the Skegemog Point ceramics is aimed towards deriving information pertinent to questions of social boundary maintenance, the permeability of those boundaries, and changes in its structure through time. The ceramic sample recovered from the Skegemog Point site is the largest and most broadly representative of the long term ceramic trends within the study area. As such, the assemblage becomes a baseline along which the evaluation of the ceramic assemblages from the other sites in the study area takes place.

Central to the use of stylistic behavior as a means of understanding broader, non-three dimensional aspects of cultural process are the concepts of visibility (Carr 1985b; Carr and Rosenthal 1986; Voss and Young 1989; Wobst 1977) and context of use (Braun 1977, 1983, 1985; Hodder 1982, 1987; Plog 1980). Visibility pertains not only to the degree of visibility of the item of material culture under consideration to the members of the relevant social group(s), but also to the degree of visibility of the overall decorative motif and its constituent parts. Obviously, the visibility of the artifact is also closely controlled by its context of use. This also greatly influences the specific form and function of items of material culture.

The individual ceramic vessel forms the primary unit of observation in this study. These artifacts provide two lines of information useful for examining the way in which social groups adjust themselves to their natural and social environments. The first is technological in character and involves things such as the physical properties of the raw material (i.e. clay and the tempering agents), the techniques of construction employed, and the general shape and size of the vessels. The second line of information, which is the primary focus of this study, pertains to the structure of the decoration applied to the vessel.

In order to characterize the perspective of ceramic vessels as objects of visual perception taken in this study, it is useful to draw an analogy. The analogy is with a painting. While their functions are radically different, pots and paintings do share some underlying structural aspects in their creation. Before creating the item, the artisan or craftsperson has some idea of what the desired end product should look like. In short, this is the concept of a mental template (Deetz 1967; Spaulding 1953). The definition of that mental template, however, may range from very precise to very general. The shape of the ceramic vessel acts as the canvas upon which the overall design is built up on. As such, it acts as a physical constraint on a particular design. It is on this surface that the background for the decorative motif is prepared. This is, in turn, followed by the execution of the specific decorative elements composing the overall motif. Just as a series of trees, lakes or mountains may form the background in a scenic painting, the type and structure of the surface preparation on the ceramic vessel serves as a background for the decorative motif. In this capacity it functions primarily as a contrastive agent, acting to draw the attention towards the focal point of the design, the decorative motif itself. The motif is composed of a series of individual elements which have a characteristic shape and mode of application. The elements are built up in a sequence of tool strokes much in the same way that a painting is built up through a series of brush strokes. The build up of elements into a primary decorative motif along with any associated secondary motifs or elements culminates the process.

The central point here is that ceramic vessels and their decorative content must be viewed as a visual whole composed of a series of interrelated parts. By applying an integrative approach to the understanding of style as advocated by Voss and Young (1989) and Stevenson (1987), it becomes possible to view stylistic behavior as a referent to social group interaction and a means of communicating information relating to social group identity. Imbedded in this approach is the concept that decorative behavior is a hierarchically arranged decision making process (Carr 1985b; Carr and

Rosenthal 1986). Further, the relevant reference population of the stylistic messaging will vary, depending on the artifact's context of use (i.e. its general degree of visibility within the social group), as well as the degree of visibility of the overall motif and its parts. The messaging may range from the level of culture group affiliation to very specific levels which have been termed "nuances of style" (Voss 1982) or "potter's choice" which are artisan specific. To a certain degree, it can be expected that as the visibility of a motif or decorative elements decreases, so will the breadth of the relevant reference population.

In his summary of Traverse wares, Cleland (n.d.a.) recognized the existence of a hierarchy of decision making in the manufacturing process and the execution of the decorative designs. Although decoratively simplistic, Traverse wares are viewed as the end product of a hierarchically arranged series of decisions concerning the type of vessel desired (Cleland n.d.a.). A six stage process was described. The first stage involves the amount of clay needed to construct the pot. Once the vessel is largely formed, the next decision involves the final rim shape; specifically collared or uncollared, and the degree of rim eversion and its shape. This step is followed by a decision concerning the nature of the rim/collar surface treatment. Decisions concerning the formation of the lip take place next. This is, in turn, followed by a decision concerning the presence or absence of lip decoration and the type of decoration to use. The final set of decisions involves decoration located on the interior and exterior of the rim.

Before examining the ceramic assemblage from the Skegemog Point site, it is necessary to consider aspects of vessel function and the context of their use. The functional range of ceramic artifacts present in most Upper Great Lakes Late Woodland period assemblages is limited. Generally, four categories are recognized: utilitarian cooking vessels, storage vessels ceramic smoking pipes, and miniature or juvenile pots. Ceramic pipes and miniature pots are not considered further in this study.

Discrimination between cooking and storage vessels is usually based on two criteria. First is simply the presence of carbonized food encrustations and/or fire sooting on the vessel exterior. Secondly, several studies have shown that the orifices of generalized cooking vessels tend to be wide relative to the vessel height and width, and relatively unrestricted (Braun 1983, Smith 1985). The presence of carbonized food remains on some of the more greatly constricted neck varieties of Mackinac ware (McPherron 1967), however, suggests that the degree of neck constriction may be more fully controlled by the type of cooking process employed (i.e., slow cooking or stewing).

Under these criterion, clear functional separation between ceramic cooking and storage vessels does not appear to occur before the late phase of the Late Woodland period. Even in the later portions of the period, the degree to which storage vessels were manufactured is not clear. It must also be remembered that ceramic vessels are only one of a number of different types of storage containers available. The collections of material culture among Upper Great Lakes populations, such as the Chandler-Pohrt collection housed at the Detroit Institute of Arts (Penney, ed. 1989), made during the nineteenth century are a testimonial to the extensive inventory the perishable industries present among these populations. The choice of containers for storage or cooking was not, by any means, strictly limited to ceramic vessels. In the Skegemog Point sample, only two Traverse phase vessels were convincingly identified as storage vessels. One vessel is undecorated, while the other is minimally decorated. Given the fact that storage vessels presumably would have a relatively low degree of visibility, this is not surprising.

For the purposes of this analysis, vessel function is considered to be invariable. The two identified Traverse phase storage vessels were included in the Traverse ware cluster analysis. It was felt that by including them and watching the way in which they partitioned out in the dendrogram that additional clues to the identification of other storage vessels might be obtained. Further, if this was not successful, given the large

size of the Traverse phase assemblage, it was felt that they would not contribute an inordinate amount of "noise" to the analysis.

As utilitarian cooking vessels, the ceramic vessels would have functioned within a domestic context. The general visibility of the vessels would be related to the location at which cooking activities took place and the size of the group consuming from the same vessel(s). Current evidence suggests that cooking occurred both within and outside of the domestic structure. Although structural remains datable to the Late Woodland period are rare in the region, the few that are known usually have both internal and external hearths associated with them (Lovis 1973:222, 236; McPherron 1967:235-239).

The size of the social unit serviced by the cooking vessels appears to be relatively small, most likely ranging from the size of a nuclear family to that of a small extended family (Feest and Feest 1978; Kinietz 1940; McClurken 1986, 1988). For the Upper Great Lakes, the Ottawa and Ojibwa/Chippewa are generally drawn on as ethnographic models for late period social groups (cf. Fitting and Cleland 1969). Even among groups such as the Iroquois where lineages shared common longhouses, each family maintained its own cooking hearth in the center of the longhouse (Fenton 1978; Ritchie 1980; Ritchie and Funk 1973).

Additionally, changes in vessel size through time may be, in part, reflective of changes in the relative size of the social units eating together. There appears to be a general trend towards larger co-residential groups through time among the Upper Great Lakes Algonquins (McPherron 1967). The shift from the small vessels typical of Bowerman ware to the larger Skegemog wares and the much larger Traverse wares may reflect this shift in the size of the basic commensal unit. The role of alterations in the composition of the diet, as well as the types of dishes being prepared also contribute influences on the size and shape of ceramic vessels.

Aspects of exchange and craft specialization can also affect the structure of ceramic stylistics (Braun 1977; Plog 1980). This, however, does not appear to be a major factor with the ceramics considered in this study. Although the structure of ceramic manufacturing systems in the Upper Great Lakes is not well understood, the prehistoric economies of the region can be characterized as oriented primarily towards a domestic mode of production (Sahlins 1972). While certain subsistence activities required supra-familial levels of cooperation, this does not appear to be the case for the production of tools and craft items. It is assumed that individual families or small groups of families filled their own ceramic needs (Rice 1987). The general lack of identifiable ceramic production areas on Late Woodland period sites may, in part, reflect this type of dispersed production. Furthermore, ceramic vessels which are clearly members of other, nonlocal ceramic ware groups (i.e., Black Duck, Bois Blanc, Mackinac, Juntunen) are rare in the Skegemog Point ceramic assemblage.

Vessel life span also affects the structure and intensity of ceramic manufacturing activities. This characteristic also relates to the suitability of the artifact as a conveyer of stylistic messaging, as well as the type of information being transmitted. The encoded messages are by nature invariable (Wobst 1977). The types of stylistic messages or information represented have the potential to vary dramatically between items of material culture that are highly durable with a long use-life and those that are frequently replaced. Estimates of ceramic vessels longevity are very difficult to arrive at and are often misleading. Ranges from several months up to a decade have been reported (David 1972; Rice 1987:296-298). Cooking vessels can be assumed to see relatively high levels of use and probably concomitantly high levels of breakage. These factors suggest a short life span for ceramic vessels; possibly as short as one or two years. Even this rate of replacement does not appear to exceed the bounds of a familial level labor pool (Arnold 1985).

Given acceptance of the above assumptions concerning the place of ceramic vessels in Upper Great Lakes Late Woodland societies, it is possible to control most of the extraneous factors, such as function, context of use, exchange, and craft specialization. All of these factors, either separately or in combination, can have dramatic effects on the structure of the stylistic content of an artifact and its suitability to act as a measure of social interaction and/or identity group messaging. Attention will now be turned to the examination of the ceramic assemblage recovered from the Skegemog Point site itself. Additional information regarding the results of the excavations at the Skegemog Point site are presented in Appendices 1 and 2.

CHAPTER 3

THE CERAMIC ASSEMBLAGE FROM THE SKEGEMOG POINT SITE

INTRODUCTION

With slightly more than 100,000 individual sherds represented, the ceramic assemblage from the Skegemog Point site is one of the largest samples of Late Woodland period ceramics currently available for study in the Upper Great Lakes. Only the Juntunen site in the Straits of Mackinac (McPherron 1967), the Moccasin Bluff site (Bettermann and Smith 1973) in southwestern Michigan, and the Spring Creek site (Fitting 1968a) near Muskegon, parallel the size and regional importance of the ceramic assemblage recovered from Skegemog Point. Herein, however their communality ends. While the tripartite ceramic sequence defined at the Juntunen site has become synonymous with Late Woodland archaeology in the Upper Great Lakes, the importance of the circa 800 year long ceramic sequence at the Skegemog Point site has remained largely unknown and unappreciated. The ceramic assemblages from the Spring Creek and Moccasin Bluff sites pertain primarily to the late and early portions of the Late Woodland period, respectively, and lack the diversity present at Skegemog Point and Juntunen.

The abundance of material, the breadth of stylistic variation represented, and the time depth represented at Skegemog Point was appreciated from the outset by Cleland (1965, n.d.a.). These features, along with the overall size of the site were central in the decision to shift field operations from the Aetna and Boven earthworks to Skegemog Point in July 1965. Ultimately, three regionally distinct and largely temporally sequential ceramic ware groups were formally recognized and defined at the site

(Cleland n.d.a.). These include the initial Late Woodland Bowerman and Skegemog ware, and the terminal Late Woodland Traverse ware.

Not only was this site intensively occupied, but, through time, the occupation was also spatially expansive affording a degree of separation of the different components. Additionally, like many sites in the Upper Great Lakes, a majority of the ceramic sherds are mere vestiges of their former selves. A large number of reconstructible vessel segments and relatively large rim and neck sherds, however, are present in the collection. The overall size of this sample ensures that the range of ceramic variability present at the site is adequately represented in the collection.

The geographic position of the site adds to the importance of the ceramic assemblage. Located near the base of Grand Traverse Bay, at the southern end of the Traverse Corridor and the northern fringes of the Carolinian-Canadian transition zone, the Skegemog Point site is situated in a geographically and culturally "strategic" position between two major Late Woodland cultural traditions. The role of the Traverse Corridor as a nexus for north-south interaction among these traditions has been indicated by Cleland (n.d.a, 1966b, 1967a, 1967b) and Lovis (1973).

The above factors make the ceramic assemblage from the Skegemog Point site suitable for addressing questions concerning the internal spatial dynamics of the site and those relationships to broader considerations of Late Woodland period chronology and cultural dynamics. The opportunity to monitor the nature, the primary direction of flow, and the intensity of social interaction patterns through time is afforded. Glimpses into the changing nature of cultural adaptations to the environmentally transitional portion of lower Michigan are also provided. Finally, examination of the Skegemog Point ceramic assemblage also contributes to understanding the broader process of interaction and boundary maintenance among egalitarian based social organizations (Fried 1967; Service 1962) as inferred through the use of stylistic behavior.

Previous research involving the ceramic assemblage from the site is limited to two documents: Cleland's preliminary report (Cleland n.d.a.) and Lovis' (1973) doctoral dissertation. The focus of the preliminary report on the ceramics was the definition and initial description of three new ceramic wares (Cleland n.d.a.). Although the actual counts employed vary slightly in the several versions of the manuscript on file at the Michigan State University Museum, the original ceramic typology was based on a sample of approximately 200 vessels. The largest reconstructed vessel fragments and a series of large rim sherds composed this sample. Approximately 110 additional vessels were separated during the initial analysis, but not described in the preliminary report. The defined ware groups include Bowerman ware (N=23 vessels), Skegemog ware (N=57 vessels), and Traverse wares (N=118 vessels) (Cleland n.d.a.). Initial impressions of the distribution of the ceramic types at the site were also drawn. Details of the original classification of the ceramics and the nature of their stylistic variability are discussed more fully below.

Lovis (1973) used a subset of 89 early phase and 94 late phase vessels from the original typology. The Skegemog Point ceramic assemblage served as the southern "anchor" in his study of Late Woodland patterns of interaction within the Traverse Corridor. The sample of ceramics employed from the Skegemog Point site was crucial in demonstrating that the Traverse Corridor had, indeed, functioned as a north/south nexus between northern and southern cultural traditions. The distribution of ceramics in the Traverse Corridor also indicated that the area was shared between the two groups rather than functioning as the territory of a distinct residential social group.

The above studies, however, focused on a relatively small portion of the total ceramic assemblage from the Skegemog Point site. Furthermore, consideration of the relationships between the distribution of ceramics and other artifact categories at the Skegemog Point site was never completed. The consideration of the ceramic assemblage from Skegemog Point, therefore, has a number of modest goals.

The first goal is the completion of the summarization of the entire ceramic assemblage from the site. This information will then be combined with the lithic assemblage and the distribution of features as means of examining the structure of the occupations at the site. The second goal is closely related to the first. This involves a further examination of the stylistic content of the assemblage using Cleland's typology as a foundation. The age of the typology and its intuitive basis, in conjunction with advances in classificatory methods and the use of ceramic stylistics as analytic tools, make this examination appropriate. The above two goals are the focus of this chapter.

The third goal further examines the place of the ceramic sequence represented at the Skegemog Point site in a regional context. Cleland (n.d.a.) provides a general understanding of the relationships with the more northern and southern ceramic sequences. To date, only a single formal regional analysis has used the Skegemog Point ceramic assemblage (Lovis 1973). That study focused on the portions of the Traverse Corridor lying north of the Skegemog Point site. The Late Woodland ceramic relationships in the area south of the Skegemog Point site have never been systematically considered. Chapter Five is the focus of these regional considerations.

METHODS

Several types of information are necessary to meet the above goals. First is a measure of the ceramic density across the site. This consists of individual counts and weights by provenience lot. Second is a measure of the ceramic stylistic variability and its changes through time. This takes the form of minimum vessel counts and their assignment to one of a number of temporally sensitive groupings. The third information set required is a sample of the minimum vessel count which is suitable for examining the structure of vessel morphology and style. The first two information sets are critical to the examination of the structure of the ceramic distribution at the site. On the other

hand, the second and third information sets are crucial to examining the stylistic relationships between the Skegemog Point site and the region to the south.

During the preliminary analysis, the ceramic assemblage was sorted into rims, necks, body sherds and sherdlets and counted. A total of 4,225 rims, 1,034 necks and 95,468 body sherds along with 66 ceramic pipe fragments and a small number of clay lumps are listed on the catalog cards for the site. The rim and neck sherds form the pool from which the initial set of minimum vessels (MNV) were drawn by Cleland (n.d.a.). Sherdlets are defined as any body sherd the size of a dime (approximately 3.25 square cm) or smaller. Due to their limited analytic value and curatorial considerations, a majority of the sherdlets were disposed of after being counted. Weights for these sherdlets are not available. Thus, when this study began, the ceramic assemblage contained 33,577 sherds curated as a series of reconstructed vessel fragments and large rim and neck sherds forming the initial vessel count, rims and necks not assigned to a vessel, body sherds, and pipe fragments. The counts and weights employed in this analysis are derived from this subset of the ceramic assemblage from the Skegemog Point site.

As noted above, both counts and weights are necessary for examining the density and distributional characteristics of the ceramics at the site. Because of the vagaries of preservation and the tendency for terra cotta ceramic vessels to disintegrate into fragments of highly variable size, weight used in conjunction with counts is the preferred density measure. Thus, all available sherds were counted and weighed according to the vessel portion represented (i.e. rim, neck, body). Further subdivisions within these three groups were made according to the type of surface treatment present and sherd size. The presence or absence of decoration on the rim and neck sherds was also recorded. In this report, sherdlets are defined as fragments measuring less than 2 cm on a side or 4 square centimeters in area. This is considered to be the minimum size necessary for accurate identification of surface treatment types.

Before continuing further, several items regarding the derivation of ceramic weights used in the examination of ceramic density need to be addressed. Two factors affect the values used in this study. The first involves the reconstructed vessel fragments. In a number of cases, there are refits between sherds from different provenience lots within and between excavation units. In the first case, sherd counts and weights are summed by excavation unit, regardless of any internal subdivisions (i.e., level, feature, or artifact concentration). In those cases where refits occur between excavation units, counts could be obtained, but weights could not without breaking the mends. The damage this would have caused the ceramics could not be justified by the information gained. Although these segments were weighed, they were ultimately deleted from the sample used to calculate the ceramic weight for each excavation unit. This resulted in the removal of 239 rim and 36 neck sherds weighing 3,156.2 grams or only 0.8% and 2.5% of the total count and weight, respectively. Unprovenienced sherds in the collection were also deleted from this portion of the analysis.

Compensating for the unavailability of weight figures for a majority of the sherdlets is more problematic. Since sherdlets appear to have comprised a significant proportion of the total ceramic weight in a number of excavation units, it was decided to employ an estimated value for the discarded sherdlets rather than to delete them from the analysis. During the analysis of the existing sherds from the site, it was found that fragments classified as sherdlets generally range between 0.5 and 1.5 grams in weight with an average of approximately 1.0 gram. A similar situation was also noted for the ceramic assemblage from the Juntunen site (McPherron 1967:46). Thus, the number of unavailable sherdlets for a given provenience lot was multiplied by 1.0 gm to provide a weight estimation. The potential effect of these estimated values in identifying areas of ceramic activity was monitored throughout the analysis.

The type of surface treatment on a vessel is not only the by-product of the manufacturing process, but also a product of active manipulation for stylistic or visual purposes. Surface treatment of the area above the shoulder appears to have been the most amenable to stylistic manipulation. The surface treatment present on the vessel body, however, appears to be more closely related to the manufacturing process, although its general contribution to the overall visual appearance can not be discounted. Nonetheless, both are the product of cultural choices.

Along the continuum from textured to untextured surfaces six types and two residual categories are recognized: 1) cordmarked, 2) fabric impressed, 3) smoothed cordmarked, 4) smoothed fabric impressed, 5) cord-wrapped dowel impressed, 6) smoothed, 7) interior, and 8) unidentifiable. A differentiation between cordmarking and fabric impressing was not maintained in the classification of the sherdlets due to size considerations.

Cordmarking consists of malleating the vessel surface with a cord-wrapped paddle without any subsequent smoothing of the vessel surface. Following Lovis (1973:44), three sizes of cordmarking are recognized; fine (6 or more cord impressions per cm), medium (4 to 6 cord impressions per cm) and, coarse (2 to 4 cord impressions per cm). The small number of body sherds exhibiting fewer than 2 cord impressions per centimeter were included in the coarse category. General association of the size of cordmarking employed with the different Late Woodland phases has been noted by several authors (Cleland n.d.a.; Fitting, ed. 1972; Lovis 1973). That is, fine and medium-sized cordmarking tends to be associated with early Late Woodland wares, such as Bowerman, Skegemog, and Spring Creek. Coarse cordmarking, on the other hand, occurs much more frequently on the late Late Woodland Traverse ware.

The second type of textured surface is created through the use of a fabric-wrapped paddle. The difficulty in differentiating cordmarking and fabric impressed surfaces without in-depth examination of the impressions (i.e., casts) has long been

recognized (e.g., Quimby 1961). A variety of twined, knotted, looped, and woven fabrics are represented. Of these, the twined fabrics bear the closest similarity to cordmarking, and in terms of their visual effect they are essentially identical. Thus, the number of fabric impressed surfaces identified in the assemblage are viewed as a conservative estimate.

A third form of textured surface was first noticed in the Skegemog Point assemblage. This type of surface was created by the use of a series of cord-wrapped dowels rather than a flat rectangular paddle to malleate the vessel surface. Use of this tool generally leaves a distinctive rolling or undulating pattern of impressions on the vessel surface. A coarse cord is usually used to wrap the dowels, although a minority employ a medium sized cord. Interestingly, this form of surface treatment was only consistently identified on body sherds. It does not appear to have been used in the treatment of the upper portions of the vessels. This form of surface treatment also appears to be primarily associated with Traverse wares.

Both cordmarked and fabric impressed surfaces were occasionally partially smoothed. These two categories may be viewed as intermediate between textured and completely untextured surfaces. Initially, the partially smoothed textured surfaces were subdivided into two categories: light (10-50% of the impression smoothed over) and heavy (50-90% of the impression smoothed over). Because this distinction did not provide significant additional information and proved to be too cumbersome, it was ultimately deleted from the analysis.

The final type of surface treatment recorded here consists of those sherds displaying completely smoothed surfaces. This category subsumes Lovis' (1973:43) sandy variety and Fitting's (1965:36) roughened variety. Although the bases of all vessels regardless of temporal affiliation are often smoothed during the manufacturing process, the employment of completely smoothed bodies during the Late Woodland period appears to be primarily associated with the later wares such as Juntunen

(McPherron 1967), Traverse (Cleland n.d.a.), Dumaw Creek (Quimby 1966), and Moccasin Bluff ware (Betteral and Smith 1973).

The two residual categories include interior sherds and sherds with unidentifiable exterior surfaces. In the former group, the surface has been lost through exfoliation of the sherd walls. This is a very common occurrence among low fired vessels constructed by the slab and anvil technique. The unidentifiable sherds generally exhibit heavily eroded interior and exterior surfaces.

Counts and weights of the body sherds were tabulated for each excavation unit and summarized for each of the main excavation blocks. Percentages of each type were then calculated. Virtually no differences in the relative proportions of the various surface treatment types were observed between the count and weight values. Only rarely did the difference exceed more than three percentage points. Thus, only counts were utilized in the cumulative frequency graph to examine the distribution of body sherd surface treatments across the site (Figure 8). The location of these excavation areas is described in Appendix 4.

It was expected that differences in the relative amounts of impressed, smoothed impressed, and smoothed surfaces in each excavation area would reflect changes in the location and intensity of occupations through time. Specifically, cordmarked and fabric impressed surfaces, particularly those employing finer sized twine, were expected to be more closely associated with the earlier phase occupations. Conversely, smoothed surfaces were expected to be more closely associated with the later phase occupations at the site. These expectations were only partially fulfilled.

Using the site totals as a baseline for comparisons, the cumulative frequency curves for Areas 1, 1A, 1B, 3, and 4B are the most similar (Figure 8). In these areas of the site, no single type of surface treatment predominates. Approximately one-third of the sherds in these areas exhibit cordmarked surfaces. Smoothed cordmarked and smoothed surfaces account for approximately one-quarter of the sherds. Finely

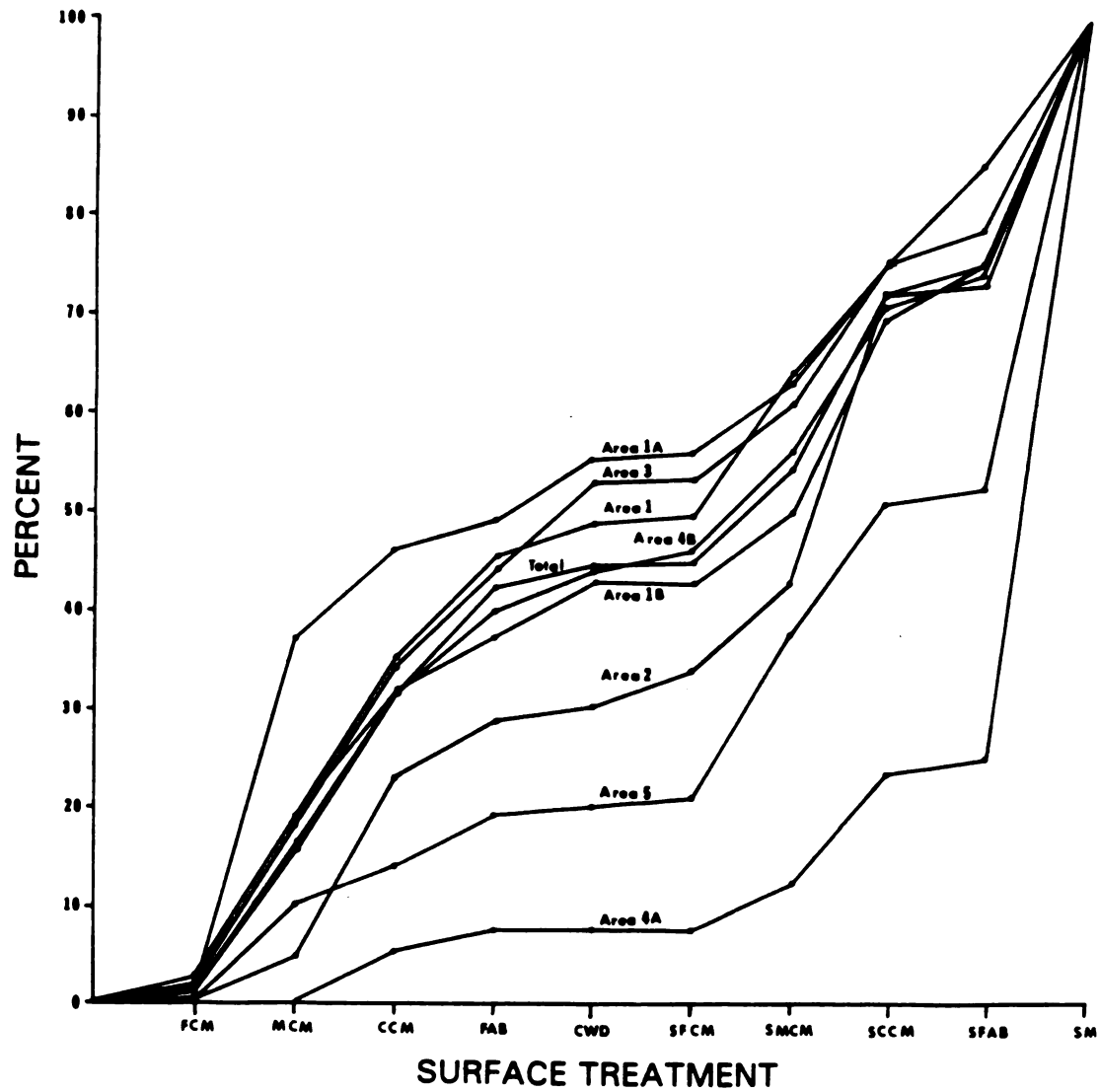


Figure 8. Cumulative Frequencies of Body Sherd Surface Treatment Types

cordmarked surfaces occur only infrequently in all of the excavation areas. Medium and coarse cordmarking occur in nearly equivalent amounts in Areas 1, 1B, 3, and, 4B. The curve for Area 1A deviates from the others primarily due to a relatively high occurrence of medium cordmarked sherds. This area also exhibits a slightly higher frequency of smoothed fabric impressed surfaces. Fabric impressed, cord-wrapped dowel impressed and their partially smoothed counterparts each represent less than 10% of the assemblage.

The distribution of surface treatment types in Area 2 (Figure 8) exhibits slightly lower frequencies of cordmarked surfaces (22.8%), but higher amounts of smoothed cordmarked surfaces (42.2%). Only moderate amounts of smoothed surfaces (21.3%) are present. In these latter two types of surface treatment, Area 2 is most similar to the areas discussed above. In contrast, excavation Areas 4A and 5 each exhibit low occurrences of cordmarked surfaces, moderate amounts of smoothed cordmarked surfaces and a relatively abundant amounts of smoothed surfaces (Figure 8). Furthermore, within Area 5, the bulk of the smoothed cordmarked sherds originate within sub-Area 5D. This sub-area appears to contain primarily early Late Woodland ceramics. The relative contribution of fabric impressed and cord-wrapped dowel impressed surfaces and their smoothed counterparts is again small.

In sum, a pattern of spatial separation between the different components at the site was not clearly reflected in the distribution of surface treatment types across the site. As expected, the areas in the northern portion of the site (Areas 1 and 1A in particular) which contain the bulk of the early phase occupations of the site displayed relatively few sherds with smoothed surfaces, while most of the sherds exhibited impressed surfaces. As noted previously, a similar situation is also seen in Area 5D.

The converse, however, does not hold with the excavation areas whose occupations are primarily associated with the Traverse phase. While Areas 4A and 5 did show relatively high amounts of smoothed surfaces, Areas 2 and 3, which produced

a majority of the Traverse phase ceramics, did not. At this point in the analysis, the reasons for this situation are not clear. However, several explanations are possible. First, these areas may not be as temporally "clean" as indicated by the distribution of the original type specimens. Second, there may be more extensive employment of cordmarked body surfaces on Traverse phase vessels than previously suspected. And, third, while there may be a significant association of finely cordmarked surfaces with the initial early Late Woodland ceramics such as Bowerman ware, this type of correlation between cordage size and ware type may not exist for Skegemog and Traverse wares.

VESSEL COUNT AND ANALYSIS

The primary unit of observation for the examination of the stylistic content represented in the assemblage is the individual ceramic vessel. Estimation of the minimum number of vessels represented in the collection is based on the rim and neck sherds. These represent the most decoratively sensitive parts of the vessel and provide the most information concerning aspects of vessel morphology. Although any sherd has the potential to represent an individual vessel, emphasis was placed on rim sherds larger than 4 square centimeters in size. Neck sherds and sherdlets were only given secondary consideration. Whenever possible such sherds were associated with identified vessels, but alone, they were not considered sufficient to identify an analytically useful vessel for the purposes of this study.

A total of 5,137 rim and 3,028 neck sherds is present in the collection. For the purpose of the minimal vessel count this number was reduced to a more manageable level. First, 2,884 rim and neck sherds compromised the preliminary vessel count for the site (Cleland n.d.a.). An additional 259 sherds representing miniature or juvenile vessels were also deleted from the analysis. Finally, 1,094 rims and 848 necks were sherdlet sized fragments. These were also deleted from the analysis. Extension of the

preliminary vessel count is based on the remaining 1,499 rims and 1,581 neck sherds, yielding a working minimal vessel count of 642 analytically usable vessels for the site.

Each of the identified vessel segments exhibits varying degrees of completeness in terms of information concerning the morphological, technologic and stylistic or decorative aspects of the vessel. Thus, it was necessary to draw a subset of vessels which contained a complete enough set of attributes to make them useful for the cluster analysis conducted in this part of the study. At the core of this subset are the vessel segments used by Cleland (n.d.a.) to construct the ceramic typology for the site. Using the larger type specimens as a guide, it was decided to utilize only those vessels which were intact from the lip to at least the middle of the neck and/or were large enough to be reasonably assured that the full complement of decorative, morphologic and technologic information was represented.

The core subset of type specimens was altered in several ways. First, close examination of these vessels permitted a number of them to be combined into a single vessel, while several others were split into several different vessels. A small number of the more highly fragmented type specimens were also deleted since they were too incomplete for the purposes of this analysis. With the additional deletion of vessels assignable to nonlocal or foreign ceramic types, a total of 581 vessels were deemed suitable for the typological and stylistic analyses.

As previously noted, the analysis conducted by Cleland (n.d.a.) provides both a classificatory and stylistic foundation for this analysis. Indeed, the type specimens utilized in the preliminary report on the site must be a central feature of any consideration of the ceramics from the Skegemog Point site. Given this fact and the fact that the availability of the preliminary report is limited, it is useful to summarize the original ceramic classification in some detail before proceeding further. All information in the succeeding paragraphs is derived from the preliminary report on the site (Cleland n.d.a.).

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ORIGINAL CLASSIFICATION OF THE SKEGEMOG POINT CERAMICS

The enormous ceramic assemblage recovered from the Skegemog Point site displays overall similarities with the known regional ceramic sequences at the time (i.e., Juntunen, Spring Creek, Dumaw Creek, and Wayne), and also exhibits a range of stylistic variation not previously encountered. From the documents on file at the Michigan State University Museum it is clear that attempts were made initially to fit the ceramics from the Skegemog Point site into extant ceramic typologies through the creation of additional varieties. Early on in that analysis, however, it became clear that existing typologies were inadequate and that a unique series of ceramics was represented.

To create the new typology, attention focused on approximately 250 of the largest reconstructed vessel segments and rim sherds present in the collection. This core group of ceramics also served to approximate the full range of morphologic and decorative variation present at the site. The sample was then subdivided into three ware groups, each composed of a series of intuitive types. Descriptive attribute frequencies were then summarized for each of the designated types.

The often close correspondence between intuitive classifications and mathematically generated classifications has been demonstrated by Whallon (1972) in his study of Owasco pottery from New York. In contrast, Brashler (1981) often found little correspondence between the types generated through the use of numerical taxonomy and the original ceramic typologies for each of her sub-regions. The important thing to remember is that all classifications are done within the framework of a problem orientation, no matter how clearly or vaguely it may be stated. Furthermore, at the time Cleland constructed the typology for the Skegemog Point site (ca. 1967-1968) the use of methods of numerical taxonomy and computer assisted exploration of the interrelationships between attributes in archaeological classification was in its infancy.

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Cleland's (n.d.a.) typology had several purposes: to describe a previously unknown ceramic series; to develop a ceramic chronology for the Skegemog Point site; and to place it within a regional context. The organizing principles and attributes used were summarized by Hughes (1967). In general, the process employed with the ceramics from the Skegemog Point site was patterned after the analysis conducted by McPherron (1967) on the ceramics from the Juntunen site. An important departure, however, is the fact that in-depth, computer assisted analysis of the identified attribute clusters was not performed on the Skegemog Point ceramics.

Hughes (1967:1) appropriately recognizes that because the ceramic sample is an incomplete one, "by chance certain pottery types are well enough represented to lend themselves to some sort of statistical analysis, while other suggested pottery types (represented by one or two vessels) are of insufficient number or of such fragmentary condition that even a complete descriptive analysis would be difficult". In other words, some vessel types are identifiable, while other vessels remain as untyped specimens. A desire to move beyond simple description of the assemblage was also expressed (Hughes 1967:1-2). Hence, the intention was to code the ceramics in such a fashion as to allow the exploration of relationships existing between the attributes. This, in turn, allows the identification of attribute clusters which can be interpreted as ceramic types.

To this end, Hughes (1967) created a hierarchically organized series of attributes and attribute states. Eleven broad, mutually exclusive categories, termed Vessel Property Categories, were developed as the basic framework (Hughes 1967:3-4). Each of these, in turn, is composed of a series of mutually exclusive Attribute Types. The structure of the attribute code for the Skegemog Point ceramics, therefore, is paradigmatic. The Vessel Property Categories and the associated Attribute Types are listed in Table 1. A brief description of the original type definitions follows.

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Lip Prof
Lacks
Has Lip

Lip Confi

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Lip Surfa

Exterior s

Table 1. Ceramic Attribute List Used by Hughes (1967)

Rim Profile:

Straight Profile: Thinned Rim
 Curved Profile: Cutcurved
 Incurved

Collar Form:

Present: Angular or Square
 Other: Rounded
 Irregular
 Absent

Lip Profile:

Lacks Lip Surface (Thinned Rim)
 Has Lip Surface: Flattened Lip Surface: Horizontal Plain:
 Exterior Fold
 Exterior Bevel:
 Exterior Fold
 Not Flattened: Rounded: Exterior Fold
 Not Rounded: Pointed
 Irregular

Lip Configuration: Regular Horizontal

Irregular Horizontal: Scalloped
 Peaked
 Castellated

Interior Surface Treatment: Smoothed: Scraped

Rough

Lip Surface Treatment: Cord-wrapped Paddle Impressed

Fabric Impressed
 Smoothed

Exterior Surface Treatment: Zoned: Smoothed Zones:

Cord-wrapped Paddle
 Fabric

Lacks Smoothed Zones:

Cord-wrapped Paddle
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Not Zoned: Cord-wrapped Paddle
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Table 1 (cont'd).

Interior Lip Band:**Horizontally Continuous Bands:****Single Tool and Technique:****Continuous Tool Element: Single Row****Multiple Rows****Discontinuous Tool Element: Single Row****Multiple Rows****Multiple Tools or Multiple Techniques****Horizontally Discontinuous Design****Exterior Lip Band:****Horizontally Continuous Band, Same Tool, Same technique:****Discontinuous Tool Element: Punctates: Round****Angular****Linear Impression:****Perpendicular****Diagonal****Continuous Tool Element****All Others: Horizontally Continuous Band, Multiple Tool
and/or Technique****Horizontally Discontinuous Band****Exterior Rim-Shoulder Decoration:****Decorative Band Centered on Rim to Low Rim Zones:****Impressions Centered on Collar Border or Mid-Lower Rim:****Collar: Single Row****Double Row Above and Below Collar****Low-Mid Rim: Single Row****Double Row****Impressions Centered Upon Upper or Mid-Upper Rim:****Decoration Centered Upon Collar:****Single Row****Multiple Rows: Same Tool and Technique****Different Tool and/or Technique****Decoration Centered Upon Mid-Upper Rim:****Single Row****Multiple Rows: Same Tool and technique****Different Tool and/or Technique****Decorative Band Centered at Neck or Shoulder:****Single Row Elongated Impressions at or Near Neck Zone:****Elongated Row of Incised or Push-Pull Technique:****Elongated Impressions Vertical:****Adjacent Punctate Rows****Elongated Impressions Oblique:****Adjacent Punctate Rows****Elongated Row of Overlapped Punctates:****Elongated Impressions Vertical:****Adjacent Punctate Rows****Elongated Impressions Oblique:****Adjacent Punctate Rows**

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Table 1 (cont'd)

All Others:**Punctated Neck Row:**

Single Row

Multiple Rows: Same Tool and Technique

Different Tool and/or Technique

Punctated Shoulder Row:

Single Row

Multiple Rows: Same Tool and/or Technique

Exterior Rim-Shoulder Decoration:**Absent:****Present:**

Continuous Horizontal Decorative Bands Centered Upon

Specific Horizontal Zones of the Rim, Neck or Upper

Shoulder

Discontinuous Tool Elements:

Decorative Band Centered Upon Upper Rim or Mid-Low Rim

Decorative Band Centered at Neck or Upon Upper Shoulder

Continuous Tool Element

All Other Vessels with Discontinuous Horizontal Bands,

Complex Designs, Multiple Tools, and Decoration Motifs

Description of Individual Tool Impressions or Tool**Techniques:****Punctates: Round**

Oval

Lunar

Angular

Linear

Impressions: Small Dots

Cord Knots

Cordwrapped Dowl or Paddle

Cordwrapped Cord or Paddle Edge

Finger Nail

Finger Pinches

Techniques: Incised Lines

Overlapped Linear Impressions Forming

Continuous Lines

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Bowerman Ware

The earliest of the three wares, Bowerman ware, is defined on the basis of 23 vessels (Cleland n.d.a.). Bowerman ware shows broad similarities with Wayne and Allegan ware, as well as some of the uncollared varieties of Spring Creek ware. It is associated with the period between approximately A.D. 600 and possibly as late as A.D. 900/1000. This ceramic ware is characterized by relatively small vessels with straight rims, unconstricted necks, and globular bodies. Several vessels exhibit slightly constricted necks. Orifice diameters averaged 7.7 cm. The use of fine cordmarking oriented either vertically or at a slightly oblique angle on the vessel surface is characteristic of this ware. No subdivisions are formally identified for this ware.

The lip profile is flat and lies in a horizontal plane in nearly all of the cases. In two instances the lip surface is outslipping. One vessel exhibits a lip with a rounded profile. Slightly less than half (43%) of the vessels exhibit thickened lips which produce an everted L-shaped profile. The rest are unthickened. Surface treatment of the lip consists of cordmarking on 61% of the vessels and smoothing on the remaining vessels. The edges of cordwrapped paddles were used in two instances. Further, it was noted that smoothed lips did not exhibit an L-shaped cross-section. Only two vessels exhibit lip decoration. In one instance the decoration is composed of cordwrapped stick impressions, while in the other instance it consists of an irregularly shaped punctate.

Rims tend to be relatively short and straight. Exterior decoration is present on 48% (11) of the vessels. Where present, exterior decoration generally consists of small (approximately 5.0 mm), shallow, circular punctates near the rim base, usually no more than 15.0 mm below the lip. Eight of the decorated vessels exhibit circular punctates. The remainder exhibit either rectangular, square, or wedge-shaped punctates. A single row of punctates placed between 7.0 and 14.0 mm apart is the most common motif. Five of the vessels, however, exhibit two rows of punctates. Interior

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Skegemog Ware

Skegemog ware was initially defined on the basis of 57 vessels. The sample was eventually expanded to include 107 vessels (Cleland n.d.a.). Associated with the early Late Woodland period (ca. A.D. 800- A.D. 1000), Skegemog ware bears strong similarities with the contemporaneous Mackinac wares indigenous to the Straits of Mackinac region (McPherron 1967). A lesser degree of similarity is also seen with the Spring Creek wares to the south (Fitting 1968a). Three types of Skegemog ware and one miscellaneous group were defined (Cleland n.d.a.).

In general, Skegemog ware is characterized by short rimmed vessels, often with moderate to greatly constricted necks and generally rounded bodies. Medium and coarse cordmarking over the entire vessel is the predominate form of surface treatment, although some use of fabrics is also noted. A soft paste is indicated for most of the vessels.

A high frequency of Skegemog ware vessels exhibit some degree of decoration. Lip decoration generally takes the form of cordwrapped paddle edge impressions, cordwrapped stick impressions, or plain tool incising. Decoration of the rim interior occurs in moderate frequencies. It is believed to be correlated with the degree of rim eversion, and, hence, its visibility (Cleland n.d.a.). A variety of techniques are employed in the execution of the exterior decoration which is almost always located on the neck of the vessel. Exterior decoration generally consists of a single horizontal row of large, deep, ovoid punctates or impressions. Execution of the decoration is accomplished through the use of a variety of tools and techniques. Included here are various portions of cordwrapped paddles, cord wrapped sticks, knots, braided and replied cords, and plain tools using a push-pull technique. Decoration tends to be

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simple, although a few instances of more complex decorative motifs comprised of multiple rows of decorative elements are recorded.

Skegemog Straight Rim: Thirty-four vessels comprise the type collection for Skegemog Straight Rim (Cleland n.d.a.). This type is characterized by straight rims that are relatively longer than is typical for Skegemog ware. A range of 25.0 mm to 40.0 mm and an average of 35 mm is reported for rim height (Cleland n.d.a.). The rim profiles are all straight and are either vertical or only slightly everted. Slightly less than one-third of these vessels exhibit greater degrees of rim eversion. Flat lip profiles are present on one-half to two-thirds of the vessels. Round, beveled, and splayed lip profiles also occur in low frequencies. Some degree of lip thickening is present on most of the vessels. This appears to be a result of finishing the surface treatment of the lip.

Approximately one-third of the vessel lips are decorated in some fashion. Decoration is located primarily on the lip surface, but it may also occur on the interior and/or exterior lip margins. Usually, the decoration consists of either cordwrapped paddle or plain tool impressions. Punctates occur in very low frequency. In several instances, the lip margins are deeply impressed, producing a sinuous lip surface.

Decoration of the rim interior is infrequent, occurring on less than 20% of the vessels. When present, it consists of a single row of punctates located just below the interior lip margin. As typical for Skegemog ware, a variety of tools are used in the execution of the rim interior decoration. Included here are knotted cords, paddle ends, and cordwrapped sticks.

Decoration is present on all but seven of the type specimens. A single row of deep punctates or impressions across the center of the neck is the most common form of decoration. Decoration is placed on the rim of only three vessels. Angular shapes executed with knotted or braided cords predominate, although round, ovoid and triangular punctates also occur in low frequencies. The individual decorative elements are oriented either vertically or diagonally. Three vessels exhibit two rows of punctates

using different tools in their execution.

Skegemog Collared Rim: Skegemog Collared Rim is the most common variety of Skegemog ware. Thirty seven vessels are used to define this variety and it is distinguished by the presence of collared rims (Cleland n.d.a.). Rims and collars tend to be short, measuring between 20.0 mm and 40.0 mm in height with an average height of 30.0 mm. The rims are often everted and the collars usually have round profiles. A minority of the vessels exhibit square collar profiles. Collars are formed either by the addition of a final clay slab to the rim or, in a few cases, by pushing the interior surface outward. This latter technique leaves a slight channel on the interior of the vessel rim. Once again, flat lip profiles are most frequent (83.8%). Round lip profiles are present on five vessels and one vessel exhibits a wedge-shaped lip.

Decoration of the lip surface occurs on slightly more than 80% of the vessels. Typically, cordwrapped paddle edges and ends are used to execute the design elements. Use of a sharp tool or a finger nail to incise the surface, as well as round punctates is also reported to occur in low frequencies (Cleland n.d.a.). Eight vessels exhibit decoration on the exterior lip margin, while seven exhibit decoration on the interior margin of the lip. Paddle edges, fingernails, and unidentified, irregular-shaped objects are used in the execution of these decorative elements. The presence of decoration on the rim interior is recorded for only a single vessel of this type.

Exterior decoration is present on all but nine of the type specimens. The exterior decoration is located on the neck of 31 vessels and on the collar of the remaining six vessels. Execution of the decoration is accomplished through the use of a wide variety of tools, none of which predominates. Included here are rectangular paddle ends, paddle corners to create triangular punctates, round and ovoid-ended plain tools, knotted cords, and braided cord segments. Decoration generally consists of a single horizontal row of elements oriented either vertically or, more frequently, at an oblique angle. Shallow, diagonally oriented, rectangular cordwrapped paddle edge

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impressions are the predominate element used on collars. One vessel exhibits triangular punctates. More complex decorative patterns are present on four other vessels. These include sequential rows of square push-pull punctates over round punctates, ovoid punctates over round punctates, and braided cord impressions over knot impressions.

Skegemog Curled Rim: The third type of Skegemog ware is named Skegemog Curled Rim. An initial sample of 11 vessels was used to define this type and a total of 22 vessels were eventually assigned to it. This group is distinguished by short (range=15.0 to 30.0 mm; average=20.0 mm), sharply curled rims, and well defined, moderately to greatly constricted necks (Cleland n.d.a.). Flat, horizontal lips predominate. As with the other types, rounded lips and lips with exterior bevels occur only in low frequencies. The lips are also frequently rolled or folded over during their formation.

Slightly over half (54.5%) of the type specimens exhibit decoration on rim interior. Decorative form is somewhat variable with the following configurations recorded; three rows of single horizontal cord impressions, closely spaced vertical cordwrapped stick impressions, two rows of single horizontal cord impressions above a row of closely spaced rectangular punctates, and a single row of shallow push-pull punctates executed with a paddle end. None of these configurations occur more than twice in the sample. It is also noted that the same tool is usually used for the decoration of both the rim interior and the lip surface.

Lip decoration is present on approximately three-quarters of the vessels. Cordwrapped paddle edge impressions and diagonal single cord impressions are the dominate elements. Use of a cordwrapped stick or a fingernail to decorate the lip is also noted in several instances. Lips are smoothed on only two of the vessels; the remainder are cordmarked.

As typical for Skegemog ware, exterior decoration consists of deep punctates placed on the neck of the vessel. This motif occurs on 17 of the 22 vessels assigned to

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the Skegemog Curled Rim type. Similar to the previously discussed type, a variety of tools are used to create the neck decoration. Included here are paddle ends, knots, and ovoid, round and pointed plain tools. Decoration is typically composed of a single horizontal row of either vertical or diagonal punctates. Three vessels exhibit multiple diagonal rows of punctates executed so they create the illusion of a single diagonal element. One other vessel exhibits a row of ovoid punctates over a row of round punctates.

Traverse Ware

Traverse ware was initially defined on the basis of 74 vessels. The sample was eventually expanded to include 136 vessels (Cleland n.d.a.). Essentially contemporaneous with Juntunen ware from the Straits of Mackinac region (McPherron 1967), Traverse ware is the latest ceramic ware group represented at Skegemog Point and is considered to date between about A.D. 1100 and A.D. 1550/1600.

In general, vessels assigned to Traverse ware are relatively large with straight to slightly everted, short rims, slight, weakly defined shoulders and globular to semi-conoidal bases (Cleland n.d.a.). Vessels assigned to this ware are usually manufactured from sandy clays and exhibit varying amounts of coarse grit temper. The bodies of the vessels are typically treated with relatively coarse cordmarking, which is occasionally partially smoothed. The rims and necks frequently exhibit differential patterns of surface treatment; a hallmark of Traverse ware. Decoration occurs on the neck, rim, and/or lip of the vessel. The decoration of Traverse ware has been characterized as minimal in extent and simple in its structure, usually executed with a limited range of tools (Cleland n.d.a.). The 136 vessels originally assigned to Traverse ware are subdivided into three primary types, and several varieties are defined within two of the types.

Traverse Plain: Traverse Plain is one of the most abundant types represented in the original sample. It is divided into two varieties: Traverse Scalloped and Traverse Undecorated (Cleland n.d.a.).

Twenty-nine vessels were assigned to the Traverse Scalloped variety. These vessels are distinguished by the presence of deeply scalloped lips. Scalloping of the lip was effected through the use of a cordwrapped dowel on about two-thirds of the vessels and deep knot impressions or finger impressions on the remaining vessels. Typically, the neck and rim surfaces are well smoothed. The principle of zoned surface treatments occurs on only a small number of the Traverse Scalloped vessels. Further, approximately one-third of the vessels exhibit short, thick collars. Approximately one-third of the collars are treated with either horizontal or diagonal cordmarking above a smoothed neck.

Decoration beyond the use of zoned surfaces is virtually absent on Traverse Scalloped vessels. Only three vessels exhibit additional decoration. This consists of a single row of punctates created by either plain tools or finger ends.

Represented by 12 vessels, Traverse Undecorated is the second variety of undecorated Traverse wares (Cleland n.d.a.). These vessels are very similar to the Traverse Scalloped variety but lack the distinctive pie crust-like scallops on the lip. Flat, horizontal lips occur on two-thirds of the vessels. The remaining one-third exhibit either peaked or castellated lips. Exterior surfaces are usually completely smoothed, although one-third of the vessels exhibit a cordmarked rim over a smoothed neck. Slightly more than half of the vessels assigned to this variety are collared. The collars exhibit either square or ribbed profiles.

Decoration on this variety of Traverse ware is limited to the vessel lip, which is invariably smoothed. Decorative techniques include transverse cord impressions, staggered interior and exterior lip edge marring, wedge-shaped finger pinching of the lip surface, plain tool punctating, and incising of the exterior margin of the lip.

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Traverse Pinched: Traverse Pinched is defined on the basis of a minimum of 50 vessels and is considered to be the most decoratively and morphologically complex form of Traverse ware (Cleland n.d.a.). Seventy percent of the lips in this type are peaked. Peaks are formed by simply pinching the lip surface upward. It has been estimated that each vessel would exhibit between four and eight peaks around their circumference (Cleland n.d.a.). Lips are smoothed and slightly more than half have flat profiles. Slightly more than 25% of the lip profiles, however, are rounded and slightly less than 20% of the lips exhibit exterior beveled profiles. Lip decoration is recorded on all except six of the type specimens. The following techniques and their frequencies of occurrence are used: cordwrapped dowel impressions (N=19); plain tool punctates (N=15); single transverse cord impressions (N=10); a central pinched ridge (N=5); deep cordwrapped dowel impressions creating a scalloped lip (N=4); and finger impressions (N=4).

Decoration of the vessel exterior involves various combinations of zoned surface treatments and a row or, occasionally, multiple rows of finger pinches or punctates. In only two instances are other tools (i.e. plain tools) used to execute the decorative elements. Five basic patterns or motifs are identified by Cleland (n.d.a.). The first and most frequent form consists of a zone of diagonal or horizontal cordmarking on the rim overlying a smoothed band on the neck which contains one row of punctates or pinches. The smoothed zone is, in turn, underlain by a zone of vertical cordmarking. Twenty-six vessels exhibit this motif. The second motif is similar to the first, except it lacks the smoothed band separating the two zones of differentially oriented cordmarking. The eight vessels with this design also exhibit a single row of punctates or pinches. The third motif consists of a smoothed rim with a row of punctates or finger pinches over a vertically or diagonally cordmarked neck. It is represented by ten vessels. The fourth variant is composed of diagonal cordmarking on the rim and a smoothed neck and lacks the row of punctates. The final variation recorded consists of

a row of punctates in a smoothed zone high on the rim and a zone of diagonal cordmarking below it. Only a single vessel exhibits this motif. The remaining few vessels in this variety are undecorated.

Traverse Punctate: Traverse Punctate comprises the third type of Traverse ware and contains two varieties: Traverse Simple Punctate and Traverse Corded Punctate (Cleland n.d.a.)

Twenty-three vessels provide the basis for the definition of Traverse Simple Punctate. These vessels are frequently collared with flat, horizontal lips (87%). Collar shapes include ribbed and square collars in approximately equal proportions, 39% and 35%, respectively. Wedge-shaped and round collars occur only infrequently. Two-thirds of the collars and rims are smoothed, while the remaining one-third exhibit either diagonal or horizontal cordmarking. Slightly under half of all of the vessels of this variety exhibit zoning of the surface treatment in the form of cordmarked rims/collars and smoothed necks.

Lip decoration occurs as single transverse cord impressions (30%); transverse incising of the lip surface (30%); incising of the interior and exterior lip margins (13%); cord wrapped dowel impressions (4%); tool punctates (4%); finger punctates (4%); and cordwrapped stick punctates (4%). Only two vessels exhibit undecorated lips.

Exterior decoration of the vessels is located exclusively on the rim or collar. On the collared vessels, the punctates are invariably placed along the lower margin of the collar. In one instance, a single row of punctates is placed at the top of the rim interior. Punctate shapes are primarily round (48%), although rectangular (39%) and C-shaped (9%) punctates are also recorded. Knots are used in three instances to produce the decorative element, while plain tools are used in the remainder of the cases.

The Traverse Corded Punctate variety is represented by five vessels and has been characterized as thin walled collared vessels with flat lips (Cleland n.d.a.). Four

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of the vessels are smoothed above the neck, while the collar of the fifth exhibits diagonal cordmarking. Lip decoration is created by single transverse cord impressions, marginal lip incising, finger punctations, and cordwrapped dowel impressions. Rim decoration is composed of either a single diagonal row or multiple horizontal rows of cord impressions overlying one or two rows of punctates placed along the lower collar margin.

ATTRIBUTE DESCRIPTIONS

At the heart of any data analysis is the attribute list used to code the individual units of observation. The structure of the attribute list and the specific attribute information collected is directly tied to the questions to which the analysis is directed. In this case, a wide variety of information concerning vessel technology, morphology, and decorative content is deemed necessary. At the time the code form and guide were developed for this analysis, the nature of the questions under consideration were only broadly defined. Thus, initially, a "shotgun" approach to vessel characterization was taken. This resulted in the collection of a broad number of attributes and provided a degree of analytic flexibility. The code form and guide used in this analysis is presented in Appendix 3.

The structure of the attribute list employed here is heavily influenced by earlier typological and stylistic analyses in the region (Holman 1978; Hughes 1967; Lovis 1973; McPherron 1967), as well as an ongoing study of the stylistic dynamics of Juntunen ware (McHale, personal communication 1987). These earlier approaches all collected a variety of technological, morphological, and stylistic or decorative information. The relative importance of these broad categories is dependent upon the nature of the analysis. Typologic studies such as those conducted by McPherron (1967) and Hughes (1967) and Cleland (n.d.a.) tend to employ a broader range of information than do the more stylistically oriented studies, such as that conducted by Lovis (1973).

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Aspects of all three of these broad categories were collected for this analysis. Attribute states are recorded as a series of multi-state nominal scale and continuous variables. The former are necessary because only a few attributes can be accurately coded on an ordinal scale and due to the requirements of the statistical techniques chosen for this study. Continuous variables were used primarily as a means to set up and verify the relative relationship between some of the nominal scale attribute sets.

General information was first collected for each vessel. This includes the size of the vessel fragment and the degree of completeness of the information on the fragment. Other general information collected includes provenience data and the number of sherds from each provenience lot assigned to a particular vessel, cross provenience refits, presence of carbonized food remains or fire sooting as it pertains to vessel function, and a generalized color description of the sherds. Any prior typological assignment of a particular vessel was also noted.

Since the primary thrust of this study concerns ceramic stylistics, the technological attributes of paste and temper characteristics and manufacturing methods are not employed in the cluster analysis. Manufacturing methods showed little variability. Except for several vessels manufactured by the pinching and drawing technique, all of the vessels in this sample are constructed by the slab and anvil technique (Rice 1987: 124-125). Paste and temper characteristics appear to function best as discriminating attributes at the ware level of classification. Since the analysis is conducted on the three wares separately, the importance of these attributes is necessarily reduced.

Briefly, Bowerman wares tend to be manufactured from either silty or fine sandy pastes that are relatively well compacted. Skegemog wares generally employ a higher frequency of silty pastes, which range from well to moderately well compacted. Traverse wares, on the other hand, are typically constructed from coarser sandy pastes and are often only moderately or weakly compacted (Cleland n.d.a.). The vessels of all

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three wares are invariably grit tempered. The amount of grit employed, however, varies widely. Bowerman wares tend to exhibit relatively low amounts of temper, as do some of the Skegemog wares. Traverse wares frequently contain high percentages of temper (Cleland n.d.a.). Paste and temper characteristics are evaluated on a post hoc basis after the generation of clusters.

Each vessel is subdivided into a series of standard morphological components; vessel interior, lip area, rim/collar, neck, body, and base. Only a few of the reconstructed vessel segments extended to or below the shoulder region. As a result, information concerning the shape of the lower portions of the vessels is severely limited. Fortunately, decoration is almost invariably located above the shoulder. As the primary fields or background zones for the application of decorative elements, these areas also provide locational meaning to the designs.

Morphological attributes characterizing general vessel shape include vessel size as indicated by rim, orifice, and neck diameters, lip and rim form and profile, degrees of lip and rim eversion and neck constriction, and shoulder shape. Although diameter measurements are not included in the clustering procedures, orifice diameter is monitored across the clusters. Rim and neck angles were found to closely correspond to the relative measures of rim eversion and neck constriction. Lip angle is treated as an indicator of lip eversion and converted to a nominal scale attribute. Measurement of the body angle generally is not possible in this sample so it is deleted from the analysis. Shoulder shape is also excluded for the same reason.

Although the ceramic vessels are viewed as a decoratively integrated unit, assignment of behavioral meaning to the designs requires examination of the hierarchy of decision making associated with their creation, the degree of visibility of the designs, and their geographic distribution (Braun 1977; Carr 1985b; Carr and Rosenthal 1986; Voss and Young 1989). The first two requirements relate to the physical structure of the design on a ceramic vessel. Design analysis is achieved by

reducing the decorative designs into their component parts and examining their structural interrelationships. The third requirement involves a regional perspective (see Chapter 5). For locational purposes the vessels are divided into three primary units; rim interior, lip area, and exterior. The lip area is, in turn, further subdivided into lip surface, interior and exterior margins. Functional exterior subdivisions include rim, neck, and shoulder. The relative location of the design within its field is also considered relevant.

Decorative motifs are composed of bands of decoration located within the fields of the vessel. The definition of a band of decoration follows that employed by Braun (1977:178), and McHale (1988) in their studies of ceramic design variability. Thus, a band of decoration consists of a contiguous and generally circumferential area of decoration employing the same tool and technique of application of the individual design elements.

Decorative bands are composed of single or multiple rows of individual design elements. Rows are composed of elements with a particular orientation (Braun 1977:178). Bands are also separated by a factor of physical distance between the compositional rows. If the distance between two rows is twice or half the distance between two other rows, they are coded as two separate bands (McHale 1988). The individual decorative element consists of a single application or stroke of the tool. As such, it is the smallest structural unit.

For each of the three primary vessel fields information is coded for the individual design elements and rows and bands of decoration. The coding includes aspects of design location, complexity of motif configuration, overall size, tool type and technique of execution, spacing of the compositional elements and rows, and individual element size, shape, orientation, and the boldness of execution. Because each of the three ceramic wares under consideration is stylistically and technologically distinct, the range of relevant attributes shifted from ware to ware. Further, in order to

maintain continuity in the scale of measurement, continuous variables were either converted to multi-state nominal scale attributes or deleted from the cluster analysis.

Finally, it should be noted that the vast majority of the vessels exhibit a relatively low degree of decorative complexity. Approximately 90% of the decorated vessels exhibit only a single band composed of a single, horizontal row of elements within any of the primary morphological zones. The degree of decorative complexity seen in types such as Mackinac Banded, Bois Blanc ware, and some of the varieties of Juntunen ware (McPherron 1967) is not seen to any great extent. The few vessels with three or more decorative bands were ultimately deleted from this stage of the analysis due to limitations in the number of multi-state nominal scale attributes which could be reasonably managed.

CLUSTER ANALYSIS OF THE SKEGEMOG POINT CERAMIC VESSELS

An abundance of statistically based analytic techniques are available for organizing objects into groups displaying varying degrees of similarity and examining the nature of the relationships among the constituent attributes. These techniques range from relatively simple, such as chi-square or contingency table analysis, to more involved and complex techniques, such as numerical taxonomy and factor analysis. Numerical taxonomy or cluster analysis has been shown to be useful in both typological and design analysis (Brashler 1981; Doran and Hodson 1975; Lovis 1973; Voss 1982). Thus, it is the analytic technique employed in this stage of the analysis.

Three clustering methods or procedures (agglomerative hierarchical, monothetic divisive, and K-means) have been discussed and evaluated by Doran and Hodson (1975:175-185). All three procedures have been used successfully in the analysis of archaeological data. Like all analytic techniques, each of these procedures has its advantages and disadvantages, its proponents and its detractors. Polythetic techniques are selected here because the resultant clusters are based on the overall similarity or

dissimilarity among the operational taxonomic units (Clifford and Stevenson 1975:104-116; Doran and Hodson 1975:175-177).

Divisive techniques, on the other hand, rely on the isolation of a single key attribute at each cluster stage. Although Whallon (1972) has argued for the utility of monothetic divisive in classifying ceramics and evaluating older typologies, questions still remain concerning the appropriateness of characterizing archaeological classes as purely monothetic sets (Brashler 1981:22; Clarke 1968:37). Further, McPherron's (1967) analysis of the Juntunen site ceramics suggest that the ceramics in the region are more polythetic than monothetic in character, particularly the early late Woodland wares. Brashler's (1981) use of both divisive and agglomerative techniques on early Late Woodland ceramics from southern Michigan generated mutually comparable results. As noted by Brashler (1981:232), the difference between monothetic and polythetic classes may be more important at the theoretical level than the practical level.

Hierarchical agglomerative procedures rely on the use of a measure of similarity or its complementary concept of dissimilarity (Clifford and Stevenson 1975:49). Squared Euclidean distance is used as the coefficient of choice in this analysis. While a direct similarity measure such as the simple matching coefficient or the Jaccard coefficient may have been more preferable, limitations with the clustering algorithm and software employed (SPSS-X) negated these as options.

Euclidean distance is a distance measure derived from Pythagoras' theorem (Clifford and Stevenson 1975:65; Doran and Hodson 1975:23). Essentially, Euclidean distance is the distance between two or more entities whose positions are determined with respect to their Cartesian coordinates in n-dimensional space (Clifford and Stevenson 1975:65). It is designed for use with interval scale data and the values employed may vary from zero to an indefinitely large number.

Clifford and Stevenson (1975:65-67) have argued that for use with nominal scale data, the value D should be replaced with its square. This avoids the calculation of the value's square root. As a result, the difference between entities becomes the number of attributes by which they differ (Clifford and Stevenson 1975:65). In this form, Euclidean Distance becomes a measure of dissimilarity for which there is no directly comparable similarity measure (Clifford and Stevenson 1975:65). One disadvantage of squared Euclidean distance is that single large differences have the potential to overly dominate a number of smaller differences (Clifford and Stevenson 1975:67).

Ward's method, or the minimum variance method, is used as the clustering algorithm (Clifford and Stevenson 1975:113- 114; Ward 1963). This method is considered to be one of the most powerful hierarchical methods of generating clusters (Jain and Dubes 1988:81; Wishart 1975:38). The algorithm is based on the error sum of squares which is defined as "the sum of the distances from each individual to the centroid of its parent cluster" (Wishart 1975:38). Fusion occurs between members which display the minimum increase in the error sum of squares. This functions to reduce the amount of within group variation, while maximizing between cluster differences and creating relatively homogeneous clusters (Sneath and Sokal 1973:132). This procedure is repeated at each stage of clustering assuring that the "best fit" is achieved.

CLUSTER ANALYSIS RESULTS

This section examines the results of the cluster analyses. As noted previously, each of the three ceramic wares represented at Skegemog Point is analyzed separately. This results from a variety of practical and analytic factors. Most importantly, by treating the wares separately a maximal amount of analytic flexibility in terms of the attribute list employed in each clustering run is afforded. Thus, it is possible to

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consider varying levels of detail of the decorative designs as the perceived levels of relative importance change. For example, a minimally and very simply decorated ware, such as Bowerman ware, simply requires fewer attributes and attribute states to characterize the decoration. Another example is decoration on the interior of rims. Among the Skegemog wares, decoration of the rim interior occurs at moderate levels and shows some degree of systematic variation. Traverse and Bowerman wares, on the other hand, are only infrequently decorated on the rim interior, and that decoration does not exhibit much variability. It also serves to keep the memory requirements of any given computer run within reasonable limits. The number of attributes employed thus ranged between 98 for Bowerman ware, 188 for Skegemog ware, and 230 for Traverse ware. The variable lists used in each of the clustering runs are presented in Tables 2, 3, and 4.

Partitioning of the dendrograms is predicated on two factors. First, the dendrograms were visually scanned and partitioned according to the distances between clusters at each stage. When the distances show a large increase, it indicates greater within-group similarity than in the previous clustering stages (Brashler 1981:241; Green 1974:45). The second consideration is one of interpretability of the isolated cluster. Simply put, the cluster should make some degree of intuitive sense and be composed of a series of discriminating attributes which can be clearly isolated. Discussion of each of the three wares and the proposed typological subdivisions ensues.

Bowerman Ware

The sample of Bowerman ware vessels employed in this analysis was increased to 76 specimens. The general characterization of this ware closely parallels that offered by Cleland (n.d.a.), with several alterations. The variables used in this analysis are presented in Table 2 and summary attribute frequencies for the clusters composing Bowerman ware are presented in Table 5.

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Table 2. Bowerman Ware Attribute List

No.	Attribute
1.	Exterior Surface Treatment (6 states)
2.	Exterior Surface Treatment Pattern (5 states)
3.	Lip Profile (4 states)
4.	Lip Surface Treatment (7 states)
5.	Lip Surface Treatment Orientation (4 states)
6.	Lip Eversion (2 states)
7.	Rim Profile (3 states)
8.	Relative Rim Height (2 states)
9.	Rim Eversion (3 states)
10.	Collar Profile (2 states)
11.	Lip Decoration (2 states)
12.	Lip Decoration Location (4 states)
13.	Lip Decorative Type (2 states)
14.	Lip Decoration Tool Type (8 states)
15.	Lip Decoration Tool Angle (2 states)
16.	Lip Decoration Element Shape (4 states)
17.	Rim Interior Decoration (2 states)
18.	Rim Interior Decoration Type (2 states)
19.	Rim Interior Decoration Tool Type (3 states)
20.	Rim Interior Decoration Element Shape (2 states)
21.	Rim Interior Decoration Element Orientation (2 states)
22.	Exterior Decoration (2 states)
23.	Band 1 Location (2 states)
24.	Band 1 Position (3 states)
25.	Band 1 Number of Rows (2 states)
26.	Band 1 Decoration Type (2 states)
27.	Band 1 Decoration Tool Type (6 states)
28.	Band 1 Decoration Element Robustness (3 states)
29.	Band 1 Decoration Element Shape (3 states)
30.	Band 1 Decoration Element Orientation (2 states)
31.	Band 2 Decoration (2 states)

Table 3. Skegemog Ware Attribute List

No.	Attribute
1.	Exterior Surface Treatment (9 states)
2.	Exterior Surface Treatment Zonation (2 states)
3.	Exterior Surface Treatment Pattern (14 states)
4.	Lip Profile (6 states)
5.	Lip Surface Treatment (9 states)
6.	Lip Surface Treatment Orientation (4 states)
7.	Rim Shape (2 states)
8.	Rim Profile (4 states)
9.	Relative Rim Height (2 states)
10.	Rim Eversion (4 states)
11.	Collar Profile (3 states)
12.	Collar Definition (2 states)
13.	Collar Relative Height (2 states)
14.	Lip Decoration (2 states)
15.	Lip Decoration Location (4 states)
16.	Lip Decoration Type (2 states)
17.	Lip Decoration Tool (10 states)
18.	Lip Decoration Tool Angle (2 states)
19.	Lip Decoration Element Shape (3 states)
20.	Lip Decoration Element Orientation (3 states)
21.	Rim Interior Decoration (2 states)
22.	Rim Interior Decoration Type (2 states)
23.	Rim Interior Decorative Motif (2 states)
24.	Rim Interior Decoration Tool (9 states)
25.	Rim Interior Decoration Number of Rows (2 states)
26.	Rim Interior Decoration Element Shape (4 states)
27.	Rim Interior Decoration Element Orientation (3 states)
28.	Exterior Decoration (2 states)
29.	Band 1 Decoration Location (4 states)
30.	Band 1 Decoration Position (4 states)
31.	Band 1 Decoration Number of Rows (2 states)
32.	Band 1 Decoration Type (3 states)
33.	Band 1 Decoration Motif (2 states)
34.	Band 1 Decoration Tool (9 states)
35.	Band 1 Decoration Tool Angle (3 states)
36.	Band 1 Decoration Element Robustness (3 states)

Table 3 (cont'd).

No.	Attribute
37.	Band 1 Decoration Element Shape (3 states)
38.	Band 1 Decoration Element Orientation (3 states)
39.	Band 1 Decoration Element Distance (2 states)
40.	Band 2 Decoration (2 states)
41.	Band 2 Decoration Location (4 states)
42.	Band 2 Decoration Position (5 states)
43.	Band 2 Decoration Number of Rows (2 states)
44.	Band 2 Decoration Type (2 states)
45.	Band 2 Decoration Motif (1 state)
46.	Band 2 Decoration Tool (5 states)
47.	Band 2 Decoration Tool Angle (3 states)
48.	Band 2 Decoration Element Robustness (3 states)
49.	Band 2 Decoration Element Shape (3 states)
50.	Band 2 Decoration Element Orientation (3 states)
51.	Band 2 Decoration Element Distance (2 states)

Table 4. Traverse Ware Attribute List

No.	Attribute
1.	Exterior Surface Treatment Type (9 states)
2.	Exterior Surface Treatment Zonation (2 states)
3.	Exterior Surface Treatment Type Pattern (16 states)
4.	Lip Form (4 states)
5.	Lip Profile (6 states)
6.	Lip Surface Treatment (9 states)
7.	Lip Surface Treatment Orientation (9 states)
8.	Rim Shape (2 states)
9.	Rim Profile (4 states)
10.	Rim Relative Height (2 states)
11.	Rim Eversion (4 states)
12.	Collar Profile (3 states)
13.	Collar Definition (2 states)
14.	Collar Relative Height (2 states)
15.	Lip Decoration (2 states)
16.	Lip Decoration Location (7 states)
17.	Lip Decoration Type (4 states)
18.	Lip Decoration Tool Type (10 states)
19.	Lip Decoration Tool Angle (4 states)
20.	Lip Decoration Element Robustness (3 states)
21.	Lip Decoration Element Shape (5 states)
22.	Lip Decoration Element Orientation (4 states)
23.	Rim Interior Decoration (2 states)
24.	Rim Interior Decoration Type (3 states)
25.	Rim Interior Decoration Tool Type (8 states)
26.	Rim Interior Decoration Element Shape (3 states)
27.	Rim Interior Decoration Element Orientation (3 states)
28.	Exterior Decoration (2 states)
29.	Band 1 Decoration Location (5 states)
30.	Band 1 Decoration Position (5 states)
31.	Band 1 Decoration Tool Type (12 states)
32.	Band 1 Decoration Tool Angle (4 states)
33.	Band 1 Decoration Element Shape (4 states)
34.	Band 1 Decoration Element Orientation (3 states)
35.	Motif Orientation (3 states)
36.	Band 1 Number of Rows (2 states)

Table 4 (cont'd).

No.	Attribute
37.	Band 1 Decoration Type (5 states)
38.	Band 1 Decoration Motif (4 states)
39.	Band 1 Decoration Element Robustness (3 states)
40.	Band 1 Decoration Element Shape (4 states)
41.	Band 1 Decoration Element Orientation (3 states)
42.	Band 2 Decoration (2 states)
43.	Band 2 Decoration Location (3 states)
44.	Band 2 Decoration Position (4 states)
45.	Band 2 Decoration Number of Rows (2 states)
46.	Band 2 Decoration Type (4 states)
47.	Band 2 Decoration Motif (3 states)
48.	Band 2 Decoration Tool Type (7 states)
49.	Band 2 Decoration Tool Angle (4 states)
50.	Band 2 Decoration Element Shape (3 states)
51.	Band 2 Decoration Element Robustness (3 states)
52.	Band 2 Decoration Element Orientation (4 states)

Table 5. Attribute Frequencies for the Bowerman Ware Clusters

CLUSTER NUMBER	1	2	3-5	6	7
PASTE TEXTURE:					
COARSE SAND	4.3	0.0	0.0	7.7	0.0
FINE SAND	39.1	66.7	55.0	61.5	14.3
SILTY	56.5	33.3	45.0	30.8	85.7
PASTE DENSITY:					
FRIABLE	8.7	0.0	0.0	7.7	0.0
MOD. COMPACT	4.3	16.7	20.0	7.7	7.1
COMPACT	39.1	33.3	45.0	7.7	35.7
VERY COMPACT	43.5	50.0	35.0	76.9	57.1
	0.0	0.0	0.0	0.0	0.0
TEMPER SIZE:					
FINE	8.7	50.0	5.0	46.2	14.3
MEDIUM	65.2	50.0	65.0	38.5	35.7
COARSE	26.1	0.0	30.0	15.4	50.0
TEMPER PERCENT:					
1-3%	30.4	33.3	20.0	23.1	21.4
5-10%	47.8	50.0	60.0	61.5	57.1
11-19%	17.4	16.7	20.0	15.4	21.4
20+%	4.3	0.0	0.0	0.0	0.0
SURFACE TREATMENT:					
FINE CORDMARK	30.4	50.0	0.0	61.5	28.6
MEDIUM CORDMARK	47.8	50.0	10.0	15.4	35.7
COARSE CORDMARK	0.0	0.0	0.0	0.0	0.0
FABRIC	17.4	0.0	50.0	23.1	7.1
SM. MED. CORDMARK	4.3	0.0	30.0	0.0	7.1
SM. FABRIC	0.0	0.0	5.0	0.0	7.1
SMOOTH	0.0	0.0	5.0	0.0	14.3
EXTERIOR PATTERN:					
23	87.0	100.0	40.0	100.0	64.3
24	13.0	0.0	25.0	0.0	0.0
29/30	0.0	0.0	30.0	0.0	21.4
31	0.0	0.0	5.0	0.0	14.3
LIP PROFILE:					
FLAT	52.2	33.3	95.0	38.5	42.9
ROUND	0.0	0.0	5.0	0.0	0.0

Table 5 (cont'd).

CLUSTER NUMBER	1	2	3-5	6	7
BEVELED	4.3	0.0	0.0	0.0	7.1
SPLAYED	43.5	0.0	0.0	53.8	42.9
ROLLED	0.0	66.7	0.0	7.7	7.1
LIP TREATMENT:					
FINE CORDMARK	34.8	16.7	0.0	46.2	14.3
MEDIUM CORDMARK	30.4	83.3	0.0	7.7	14.3
FABRIC	0.0	0.0	25.0	23.1	0.0
SM. MED. CORDMARK	26.1	0.0	5.0	7.7	0.0
SM. FABRIC	8.7	0.0	10.0	0.0	0.0
SMOOTH	0.0	0.0	60.0	15.4	71.4
LIP EVERSION:					
YES	8.7	50.0	0.0	7.7	7.1
NO	91.3	50.0	100.0	92.3	92.9
RIM PROFILE:					
STRAIGHT	82.6	100.0	80.0	84.6	78.6
THICKED AT TO LIP	8.7	0.0	0.0	7.7	14.3
COLLARED	8.7	0.0	20.0	7.7	7.1
RELATIVE RIM HEIGHT:					
SHORT	65.2	100.0	70.0	76.9	57.1
MEDIUM	34.8	0.0	30.0	23.1	42.9
RIM EVERSION:					
NONE	73.9	66.7	60.0	53.8	57.1
SLIGHT	21.7	33.3	35.0	46.2	42.9
MEDIUM	4.3	0.0	5.0	0.0	0.0
COLLAR PROFILE:					
SQ/WEDGE	8.7	0.0	20.0	0.0	7.1
ROUND	0.0	0.0	25.0	23.1	0.0
LIP DECORATION:					
YES	0.0	83.3	0.0	0.0	92.9
NO	100.0	16.7	100.0	100.0	7.1
LIP LOCATION:					
SURFACE	0.0	66.7	0.0	0.0	50.0
INTERIOR	0.0	0.0	0.0	0.0	14.3

Table 5 (cont'd).

CLUSTER NUMBER	1	2	3-5	6	7
EXTERIOR	0.0	16.7	0.0	0.0	14.3
INTERIO/EXTERIOR	0.0	0.0	0.0	0.0	14.3
LIP TYPE:					
PUNCTATE	0.0	16.7	0.0	0.0	14.3
IMPRESSED	0.0	66.7	0.0	0.0	78.6
LIP TOOL:					
CW STICK EDGE	0.0	33.3	0.0	0.0	14.3
CORDWRAPPED OBJ	0.0	16.7	0.0	0.0	7.1
PLAIN STICK-PT	0.0	0.0	0.0	0.0	0.0
PLAIN STICK-DULL	0.0	0.0	0.0	0.0	21.4
PLAIN STICK EDGE	0.0	0.0	0.0	0.0	0.0
PLAIN TOOL-CHISEL	0.0	16.7	0.0	0.0	21.4
PLAIN TOOL-DULL	0.0	16.7	0.0	0.0	14.3
PLAIN TOOL EDGE	0.0	0.0	0.0	0.0	7.1
CW PADDLE EDGE	0.0	0.0	0.0	0.0	7.1
LIP ELEMENT SHAPE:					
RECTANGULAR	0.0	33.3	0.0	0.0	21.4
RECT.-LINEAR	0.0	16.7	0.0	0.0	42.9
OVOID	0.0	33.3	0.0	0.0	21.4
CIRCULAR	0.0	0.0	0.0	0.0	7.1
LIP ELEMENT ORIENTATION					
VERTICAL	0.0	33.3	0.0	0.0	50.0
HORIZONTAL	0.0	0.0	0.0	0.0	7.1
OBLIQUE RIGHT	0.0	16.7	0.0	0.0	21.4
OBLIQUE LEFT	0.0	33.3	0.0	0.0	7.1
COMBINATION	0.0	0.0	0.0	0.0	7.1
LIP ELEMENT ROBUSTNESS:					
SHALLOW	0.0	16.7	0.0	0.0	42.9
MEDIUM	0.0	66.7	0.0	0.0	35.7
DEEP	0.0	0.0	0.0	0.0	14.3
RIM INTERIOR DECORATION:					
YES	8.7	16.7	10.0	0.0	7.1
NO	91.3	83.3	90.0	100.0	92.9

Table 5 (cont'd).

CLUSTER NUMBER	1	2	3-5	6	7
RIM INTERIOR TYPE:					
PUNCTATE	4.3	0.0	0.0	0.0	0.0
IMPRESSED	0.0	16.7	0.0	0.0	7.1
RIM INTERIOR TOOL:					
CW STICK END	0.0	0.0	0.0	0.0	0.0
CW STICK EDGE	0.0	16.7	0.0	0.0	0.0
KNOT/KINKED CORD	0.0	0.0	0.0	0.0	7.1
PLAIN STICK-DULL	4.3	0.0	0.0	0.0	0.0
PLAIN PADDLE END	0.0	0.0	0.0	0.0	0.0
CW PADDLE EDGE	0.0	0.0	0.0	0.0	0.0
RIM INTERIOR ELEMENT SHAPE:					
RECTANGULAR	4.3	0.0	0.0	0.0	0.0
RECT.-LINEAR	0.0	0.0	0.0	0.0	0.0
OVOID	0.0	16.7	0.0	0.0	7.1
EXTERIOR DECORATION:					
YES	0.0	0.0	0.0	100.0	100.0
NO	100.0	100.0	100.0	0.0	0.0
BAND 1 LOCATION:					
RIM	0.0	0.0	0.0	53.8	35.7
COLLAR	0.0	0.0	0.0	0.0	0.0
NECK	0.0	0.0	0.0	46.2	64.3
BAND 1 POSITION:					
TOP	0.0	0.0	0.0	15.4	50.0
MIDDLE	0.0	0.0	0.0	38.5	14.3
BOTTOM	0.0	0.0	0.0	46.2	35.7
ENTIRE	0.0	0.0	0.0	0.0	0.0
BAND 1 NUMBER OF ROWS:					
ONE	0.0	0.0	0.0	69.2	92.9
TWO OR MORE	0.0	0.0	0.0	30.8	7.1
BAND 1 TYPE:					
PUNCTATE	0.0	0.0	0.0	100.0	92.9
IMPRESSED	0.0	0.0	0.0	0.0	7.1

Table 5 (cont'd).

CLUSTER NUMBER	1	2	3-5	6	7
BAND 1 TOOL:					
CW STICK END	0.0	0.0	0.0	0.0	0.0
CW STICK EDGE	0.0	0.0	0.0	0.0	7.1
PLAIN STICK-PT	0.0	0.0	0.0	15.4	14.3
PLAIN STICK-DULL	0.0	0.0	0.0	61.5	50.0
PLAIN TOOL RAG	0.0	0.0	0.0	23.1	14.3
PLAIN PADDLE END	0.0	0.0	0.0	0.0	7.1
PL. PADDLE CORNER	0.0	0.0	0.0	0.0	7.1
BAND 1 ELEMENT SHAPE:					
RECTANGULAR	0.0	0.0	0.0	23.1	28.6
CIRCULAR	0.0	0.0	0.0	76.9	71.4
WEDGE/TRIANGLE	0.0	0.0	0.0	0.0	0.0
BAND 2 DECORATION:					
YES	0.0	0.0	0.0	0.0	0.0
NO	0.0	0.0	0.0	0.0	0.0
N OF CASES	23	6	20	13	14

This sample did not alter the general impression of vessel shape, lip, rim, and neck forms. Surface treatment is predominantly cordmarked (68.4%), while slightly more than one-quarter (26.3%) is fabric impressed. Only about 40 percent of the cordmarked vessels, however, were classified as employing fine cords. Further, the vast majority of the fabric impressed surfaces consisted of close twined fabrics, which visually approximates fine cordmarking. The orientation of the surface treatment is usually vertical. The range and mean orifice diameter is significantly larger than in Cleland's (n.d.a.) sample. A range in orifice diameters between 7.0 cm and 27.0 cm and an average of 14.7 cm is present in this sample.

The texture of the paste is approximately evenly split between fine sandy and silty varieties that are either compact or very compact. Medium to coarse-sized grit temper in quantities of less than 10% of the paste predominate. Collared rims and splayed lip profiles are added to the list of recognized lip forms. The percentage of smoothed lips increased to 31.5% in this sample.

The Bowerman vessels agglomerated into two primary clusters; Bowerman Plain (49 vessels) and Bowerman Decorated (27 vessels). The dendrograms for the two types of Bowerman ware are illustrated in Figures 9 and 10. The occurrence of decoration on the interior of the vessel rim is a rare occurrence. Vessels with rim interior decoration are scattered across virtually all of the identified clusters. Each of the two primary clusters is divisible into several varieties based on the location of decoration, and the presence or absence of decoration on the vessel lip.

Bowerman Plain (Figures 9, 10 and 11; Table 5): These vessels are characterized by a nearly complete lack of decoration on the vessel. Only a single vessel is decorated on its exterior. This type is divided into three varieties: Cordmarked, Decorated Lip, and Fabric Impressed.

The cordmarked variety of Bowerman ware is represented by 23 vessels (Figure 11). This variant is distinguished from the other undecorated varieties by the use of

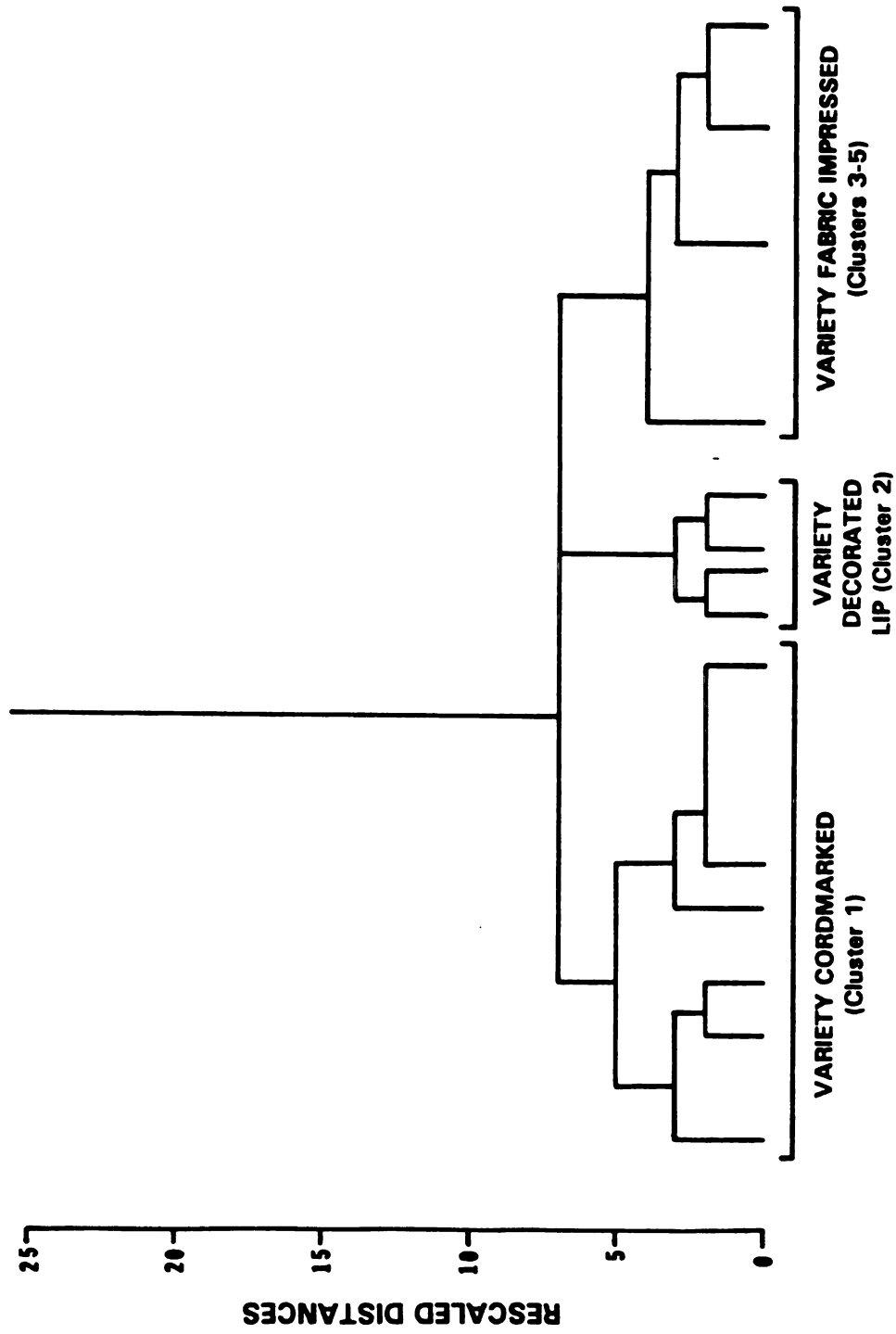


Figure 9. Bowerman Plain Dendrogram

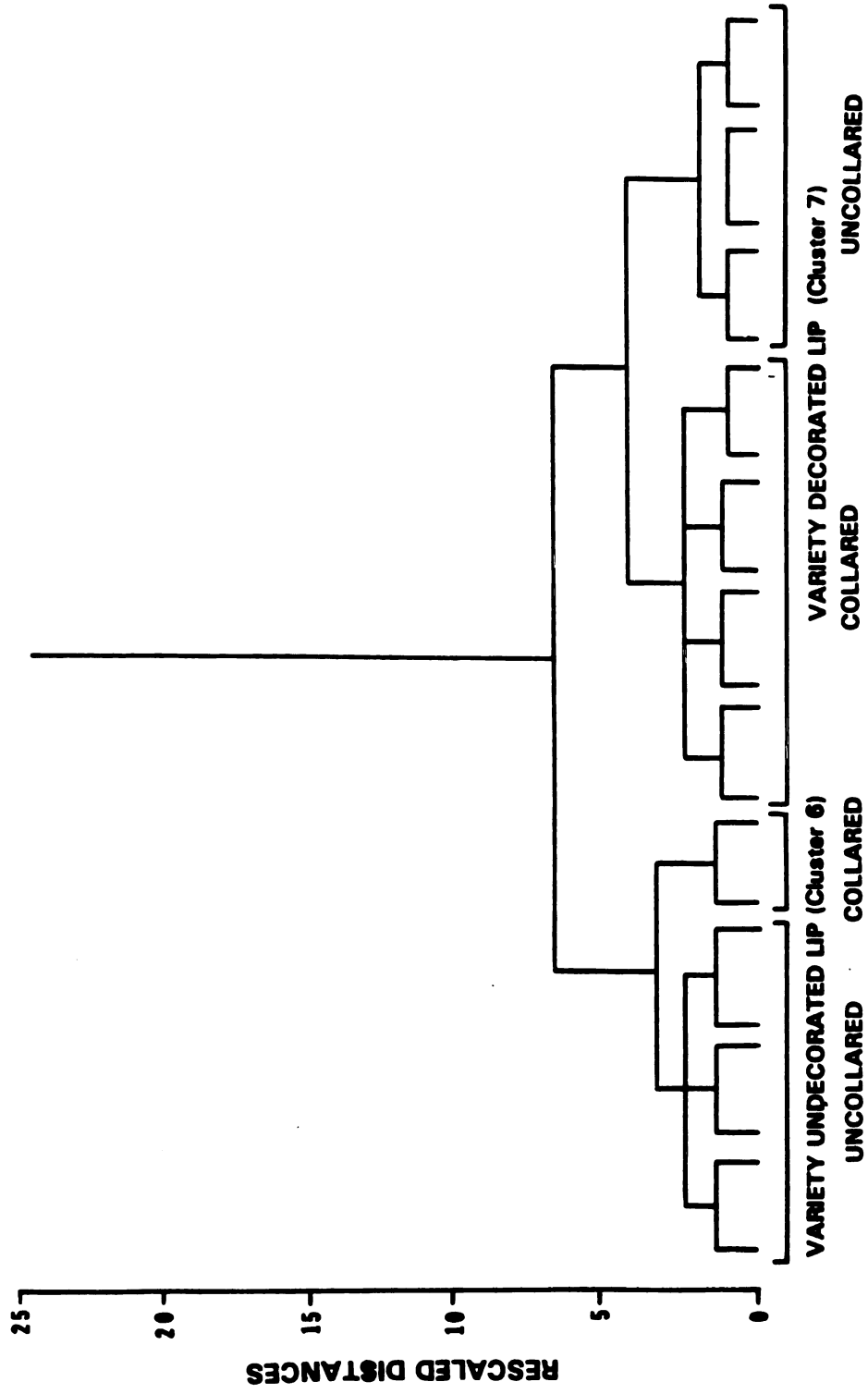


Figure 10. Bowerman Decorated Dendrogram

Figure 11. Bowerman Plain, Variety Cordmarked

Figure 12. Bowerman Plain, Varieties Decorated Lip and Fabric Impressed

Row 1: Variety Decorated Lip

Row 2: Variety Fabric Impressed



Figure 11.



Figure 12.

minimal, medium or fine cordmarking on the exterior of the vessels. Rims have straight profiles and generally are not everted. About one-quarter of the vessels exhibit slightly everted rims. Lips are flat and are typically cordmarked. These vessels lack any decoration.

The second variant is termed Bowerman Plain, variety Decorated Lip (Figure 12, Row 1). This cluster of six vessels is differentiated by the presence of decoration on the surface of the lip. The lips also tend to be rolled, often are everted, and are cordmarked. Lip decoration consists of a variety of different tool impressions (Table 3).

The third variant of Bowerman Plain is represented by 20 vessels. It is distinguished by the use of fabric wrapped paddles to treat the exterior of the vessel surface (Figure 12, Rows 2-3). Like the first variant, Bowerman Plain, variety Fabric Impressed totally lacks decoration. This variety also displays the highest occurrence of collared rims. Interestingly, Brashler (1981:241-254) found both undecorated and decorated versions of collared Allegan and Spring Creek wares. Although several of the decorated Bowerman varieties do exhibit decoration on their exteriors, it is a very rare occurrence and stands in contrast to the southern early Late Woodland wares.

Bowerman Decorated (Figures 10, 13, and 14; Table 5): This type is defined primarily by the occurrence of decoration on the vessel exterior as well as the occurrence of splayed lip profiles.

The two varieties of Bowerman Decorated ceramics are termed Undecorated Lip and Decorated Lip. Partitioning of the variants comprising this type is based on the presence or absence of lip decoration. In both varieties, the location of the decoration is split about evenly between the rim and the neck of the vessel. In the first variety, decoration tends to be placed in either the center or the bottom of the field, while in the second variant it tends to occur either at the top or the bottom of the field. Decoration almost invariably consists of circular punctates executed with either a dull-ended stick

or a ragged-ended tool. The few vessels which exhibit multiple bands of decoration or multiple rows of punctates within a band are associated with the first variant.

Skegemog Ware

A sample of 198 vessels are assigned to Skegemog ware for this analysis. The attributes used are listed in Table 3. Overall similarities with the original type definition (Cleland n.d.a.) are maintained. The internal structure of the defining attributes of the types and varieties of this ware, however, showed a degree of difference. A revised classification is proposed here. Various permutations of decorative attribute association appear to function as the key discriminators in the primary clusters. In contrast, Cleland's (n.d.a.) classification of Skegemog wares keys in on aspects of rim form and degree of eversion. A similar pattern was noted by Brashler (1981) when she compared her clusters with earlier typological schemes for southern Michigan.

In general, Skegemog ware is characterized by moderately compact to compact silty pastes (Table 6). Temper tends to be medium in size, occurring in frequencies of about 5 to 10 percent. Interestingly, the decorated types of Skegemog ware tend to have coarser temper and slightly less compact pastes than the undecorated types. This stands in contrast to the paste and temper characteristics of Bowerman ware. For the first time, the concept of intentional zoning of the exterior surface treatment also appears with Skegemog ware. This type of manipulation of surface treatment occurs only infrequently. When it does occur, it is almost invariably in the form of differently oriented cordmarking or fabric impressions. The use of smoothed zones seen in the later Traverse wares does not occur. Furthermore, the partial smoothing of cordmarked and fabric impressed surfaces is infrequent.

Skegemog ware is partitioned into two primary types based on the presence or absence of exterior decoration; Skegemog Plain and Skegemog Decorated (Figures 15 and 16; Table 6).

Fig

Fig

Figure 13. **Bowerman Decorated, Variety Undecorated Lip**

Figure 14. **Bowerman Decorated, Variety Decorated Lip**

F

Fig



Figure 13.



Figure 14.

Table 6. Attribute Frequencies for the Skegemog Ware Clusters

CLUSTER NUMBER	1	2	3	4	5	6/7	8	9/10
PASTE TEXTURE:								
COARSE SAND	15.8	7.1	12.5	16.7	7.1	19.2	11.1	17.2
FINE SAND	21.1	42.9	25.0	44.4	28.6	23.1	38.9	27.6
SILTY	63.2	50.0	62.5	38.9	64.3	57.7	50.0	55.2
PASTE DENSITY:								
FRIABLE	10.5	7.1	0.0	11.1	7.1	15.4	16.7	6.9
MOD. COMPACT	21.1	7.1	18.8	33.3	14.3	26.9	22.2	41.4
COMPACT	57.9	64.3	56.3	44.4	42.9	46.2	58.3	17.2
VERY COMPACT	10.5	21.4	25.0	11.1	35.7	11.5	11.1	34.5
TEMPER SIZE:								
FINE	31.6	7.1	12.5	0.0	0.0	13.5	11.1	17.2
MEDIUM	26.3	57.1	50.0	50.0	35.7	36.5	47.2	34.5
COARSE	42.1	35.7	37.5	50.0	64.3	50.0	41.7	48.3
TEMPER PERCENT:								
1-3%	21.1	14.3	31.3	22.2	14.3	19.2	8.3	10.3
5-10%	52.6	64.3	50.0	66.7	57.1	36.5	58.3	51.7
11-19%	5.3	7.1	12.5	11.1	14.3	28.8	16.7	27.6
20+%	26.3	14.3	6.3	0.0	14.3	15.4	16.7	10.3
EXTERIOR ZONING:								
YES	5.3	7.1	6.3	16.7	7.1	9.6	11.1	6.9
NO	94.7	92.9	93.8	83.3	92.9	90.4	88.9	93.1

Table 6 (cont'd).

CLUSTER NUMBER	1	2	3	4	5	6/7	8	9/10
SURFACE TREATMENT:								
FINE CORDMARK	36.8	14.3	6.3	0.0	7.1	9.6	5.6	3.4
MEDIUM CORDMARK	21.1	7.1	31.3	27.8	28.6	25.0	22.2	10.3
COARSE CORDMARK	10.5	14.3	18.8	11.1	0.0	17.3	16.7	13.8
FABRIC	21.1	28.6	31.3	22.2	21.4	32.7	36.1	41.4
SM. FINE CORDMARK	0.0	7.1	0.0	0.0	0.0	0.0	2.8	0.0
SM. MED. CORDMARK	0.0	7.1	6.3	22.2	21.4	5.8	2.8	3.4
SM. COARSE CORDMARK	0.0	7.1	6.3	0.0	7.1	0.0	8.3	3.4
SM. FABRIC	0.0	14.3	0.0	16.7	7.1	3.8	2.8	10.3
SMOOTH	10.5	0.0	0.0	0.0	7.1	5.8	0.0	13.8
EXTERIOR PATTERN:								
1	0.0	0.0	0.0	5.6	7.1	1.9	2.8	3.4
3	5.3	7.1	0.0	5.6	0.0	1.9	0.0	3.4
4	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0
5	0.0	0.0	6.3	0.0	0.0	1.9	0.0	0.0
16	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.0
23	31.6	14.3	75.0	66.7	57.1	57.7	36.1	34.5
24	47.4	21.4	12.5	11.1	14.3	13.5	25.0	24.1
25	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	0.0	0.0	0.0	5.6	0.0	0.0	0.0	0.0
29	0.0	28.6	6.3	5.6	7.1	9.6	16.7	13.8
30	0.0	14.3	0.0	0.0	7.1	3.8	11.1	6.9
31	10.5	14.3	0.0	0.0	7.1	5.8	0.0	13.8

Table 6 (cont'd).

CLUSTER NUMBER	1	2	3	4	5	6/7	8	9/10
LIP PROFILE:								
FLAT	42.1	57.1	12.5	55.6	78.6	21.2	97.2	34.5
ROUND	0.0	21.4	6.3	11.1	0.0	11.5	2.8	41.4
WEDGE	5.3	7.1	0.0	0.0	7.1	1.9	0.0	3.4
BEVELED	0.0	7.1	12.5	5.6	7.1	11.5	0.0	0.0
SPLAYED	36.8	0.0	56.3	11.1	7.1	36.5	0.0	13.8
ROLLED	15.8	7.1	12.5	16.7	0.0	17.3	0.0	6.9
LIP TREATMENT:								
FINE CORDMARK	36.8	7.1	6.3	0.0	7.1	3.8	2.8	0.0
MEDIUM CORDMARK	15.8	0.0	6.3	11.1	14.3	9.6	2.8	0.0
COARSE CORDMARK	5.3	14.3	6.3	5.6	0.0	3.8	5.6	0.0
FABRIC	10.5	21.4	12.5	16.7	14.3	7.7	25.0	0.0
SM. FINE CORDMARK	0.0	7.1	0.0	0.0	0.0	0.0	2.8	0.0
SM. MED. CORDMARK	5.3	0.0	0.0	5.6	0.0	1.9	0.0	0.0
SM. COARSE CORDMARK	0.0	0.0	6.3	0.0	0.0	0.0	2.8	0.0
SM. FABRIC	0.0	0.0	0.0	5.6	7.1	1.9	5.6	6.9
SMOOTH	26.3	50.0	62.5	55.6	57.1	71.2	52.8	93.1
LIP EVERSION:								
YES	26.3	28.6	18.8	22.2	14.3	48.1	41.7	27.6
NO	73.7	71.4	81.3	77.8	85.7	51.9	58.3	72.4

Table 6 (cont'd).

[illegible]

Table 6 (cont'd).

CLUSTER NUMBER	1	2	3	4	5	6/7	8	9/10
RIM SHAPE:								
STRAIGHT	89.5	71.4	50.0	66.7	92.9	42.3	66.7	79.3
CURVED	10.5	28.6	50.0	33.3	7.1	57.7	33.3	20.7
RIM PROFILE:								
STRAIGHT	73.7	0.0	68.8	33.3	0.0	75.0	61.1	17.2
WEDGE	10.5	0.0	0.0	0.0	0.0	7.7	2.8	6.9
THICKENED TO LIP	10.5	0.0	25.0	5.6	7.1	13.5	2.8	6.9
COLLARED	5.3	100.0	6.3	61.1	92.9	3.8	33.3	69.0
RELATIVE RIM HEIGHT:								
SHORT	78.9	35.7	93.8	55.6	42.9	75.0	47.2	37.9
MEDIUM	15.8	64.3	6.3	38.9	57.1	21.2	50.0	62.1
HIGH	5.3	0.0	0.0	5.6	0.0	3.8	2.8	0.0
RIM EVERSION:								
NONE	52.6	14.3	12.5	27.8	35.7	15.4	22.2	10.3
SLIGHT	31.6	35.7	18.8	16.7	35.7	26.9	27.8	51.7
MEDIUM	5.3	50.0	62.5	44.4	21.4	28.8	36.1	31.0
GREAT	10.5	0.0	6.3	11.1	7.1	28.8	13.9	6.9
COLLAR PROFILE:								
SQUARE	0.0	0.0	0.0	16.7	7.1	0.0	0.0	0.0
WEDGE	0.0	14.3	0.0	5.6	14.3	3.8	2.8	13.8
ROUND	5.3	85.7	6.3	38.9	71.4	0.0	30.6	55.2

Table 6 (cont'd).

CLUSTER NUMBER	1	2	3	4	5	6/7	8	9/10
LIP DECORATION TYPE:								
PUNCTATE	0.0	0.0	18.8	22.2	0.0	7.7	5.6	24.1
IMPRESSED	0.0	0.0	81.3	77.8	50.0	82.7	8.3	75.9
LIP TOOL:								
CW STICK END	0.0	0.0	18.8	11.1	0.0	1.9	0.0	13.8
CORD	0.0	0.0	0.0	0.0	0.0	5.8	0.0	10.3
KNOT/KINKED CORD	0.0	0.0	0.0	5.6	0.0	0.0	0.0	10.3
PLAIN STICK-PT	0.0	0.0	6.3	5.6	0.0	1.9	0.0	6.9
PLAIN STICK-DULL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4
PLAIN STICK EDGE	0.0	0.0	0.0	0.0	7.1	0.0	0.0	0.0
PLAIN TOOL RAG	0.0	0.0	0.0	16.7	14.3	11.5	2.8	20.7
PLAIN TOOL-CHISEL	0.0	0.0	12.5	11.1	7.1	0.0	5.6	13.8
PLAIN TOOL-DULL	0.0	0.0	12.5	33.3	0.0	28.8	0.0	13.8
PLAIN TOOL EDGE	0.0	0.0	6.3	0.0	0.0	5.8	0.0	0.0
PLAIN PADDLE END	0.0	0.0	18.8	11.1	0.0	7.7	0.0	0.0
PLAIN PADDLE EDGE	0.0	0.0	0.0	0.0	7.1	13.5	2.8	3.4
PL. PADDLE CORNER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4
CW PADDLE END	0.0	0.0	0.0	0.0	7.1	0.0	0.0	0.0
CW PADDLE EDGE	0.0	0.0	25.0	5.6	7.1	13.5	2.8	0.0
LIP TOOL ANGLE:								
STRAIGHT IN	0.0	0.0	81.3	83.3	28.6	71.2	8.3	82.8
ANGLED RIGHT	0.0	0.0	18.8	16.7	21.4	19.2	5.6	17.2

Table 6 (cont'd).

CLUSTER NUMBER	1	2	3	4	5	6/7	8	9/10
LIP ELEMENT ROBUSTNESS:								
SHALLOW	0.0	0.0	0.0	33.3	21.4	34.6	2.8	31.0
MEDIUM	0.0	0.0	50.0	33.3	14.3	34.6	5.6	24.1
DEEP	0.0	0.0	50.0	33.3	14.3	21.2	5.6	44.8
LIP ELEMENT SHAPE:								
RECTANGULAR	0.0	0.0	56.3	38.9	21.4	34.6	8.3	27.6
RECT.-LINEAR	0.0	0.0	18.8	44.4	14.3	51.9	2.8	24.1
SQUARE	0.0	0.0	0.0	0.0	0.0	0.0	2.8	3.4
OVOID	0.0	0.0	25.0	16.7	14.3	1.9	0.0	44.8
CIRCULAR	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.0
LIP ELEMENT ORIENTATION:								
VERTICAL	0.0	0.0	68.8	72.2	28.6	46.2	13.9	93.1
OBLIQUE RIGHT	0.0	0.0	31.3	0.0	21.4	30.8	0.0	3.4
OBLIQUE LEFT	0.0	0.0	0.0	22.2	0.0	5.8	0.0	3.4
COMBINATION	0.0	0.0	0.0	5.6	0.0	7.7	0.0	0.0
RIM INTERIOR DECORATION:								
YES	21.1	0.0	100.0	0.0	14.3	42.3	0.0	13.8
NO	78.9	100.0	0.0	100.0	85.7	57.7	100.0	86.2
RIM INTERIOR TYPE:								
PUNCTATE	10.5	0.0	18.8	0.0	0.0	9.6	0.0	3.4
IMPRESSED	10.5	0.0	81.3	0.0	7.1	32.7	0.0	10.3

Table 6 (cont'd).

CLUSTER NUMBER	1	2	3	4	5	6/7	8	9/10
CRESCENT	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LINEAR	0.0	0.0	0.0	0.0	0.0	7.7	0.0	0.0
RIM INTERIOR ELEMENT ORIENTATION:								
VERTICAL	0.0	0.0	50.0	0.0	14.3	21.2	0.0	6.9
HORIZONTAL	0.0	0.0	0.0	0.0	0.0	7.7	0.0	0.0
OBLIQUE RIGHT	0.0	0.0	0.0	0.0	0.0	5.8	0.0	6.9
OBLIQUE LEFT	21.1	0.0	50.0	0.0	0.0	7.7	0.0	0.0
RIM INTERIOR ROBUSTNESS:								
SHALLOW	0.0	0.0	31.3	0.0	0.0	11.5	0.0	10.3
MEDIUM	0.0	0.0	62.5	0.0	14.3	21.2	0.0	3.4
DEEP	0.0	0.0	6.3	0.0	0.0	9.6	0.0	0.0
EXTERIOR DECORATION:								
YES	0.0	0.0	0.0	0.0	100.0	100.0	100.0	100.0
NO	100.0	100.0	100.0	100.0	0.0	0.0	0.0	0.0
EXTERIOR DECORATIVE MOTIF:								
LINEAR-VERTICAL	0.0	0.0	0.0	0.0	100.0	100.0	97.2	100.0
LINEAR-HORIZONTAL	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0
LINEAR-OBL RIGHT	0.0	0.0	0.0	0.0	0.0	5.8	0.0	0.0

Table 6 (cont'd).

CLUSTER NUMBER	1	2	3	4	5	6/7	8	9/10
BAND 1 LOCATION:								
RIM	0.0	0.0	0.0	0.0	14.3	9.6	11.1	0.0
COLLAR	0.0	0.0	0.0	0.0	78.6	0.0	2.8	0.0
NECK	0.0	0.0	0.0	0.0	7.1	88.5	86.1	100.0
RIM/NECK	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.0
BAND 1 POSITION:								
TOP	0.0	0.0	0.0	0.0	50.0	5.8	13.9	17.2
MIDDLE	0.0	0.0	0.0	0.0	14.3	67.3	52.8	24.1
BOTTOM	0.0	0.0	0.0	0.0	14.3	21.2	33.3	58.6
ENTIRE	0.0	0.0	0.0	0.0	21.4	5.8	0.0	0.0
BAND 1 NUMBER OF ROWS:								
ONE	0.0	0.0	0.0	0.0	100.0	96.2	94.4	96.6
TWO OR MORE	0.0	0.0	0.0	0.0	0.0	3.8	5.6	3.4
BAND 1 TYPE:								
PUNCTATE	0.0	0.0	0.0	0.0	21.4	75.0	86.1	93.1
IMPRESSED	0.0	0.0	0.0	0.0	78.6	19.2	8.3	0.0
MULTIPLE PUNCTATE	0.0	0.0	0.0	0.0	0.0	5.8	5.6	6.9
BAND 1 TOOL:								
FINGER END/NAIL	0.0	0.0	0.0	0.0	0.0	1.9	2.8	0.0
CW STICK EDGE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.3
CD-WRAPPED OBJECT	0.0	0.0	0.0	0.0	7.1	3.8	0.0	0.0

Table 6 (cont'd).

CLUSTER NUMBER	1	2	3	4	5	6/7	8	9/10
KNOT/KINKED CORD	0.0	0.0	0.0	0.0	7.1	0.0	0.0	0.0
PLAIN STICK-PT	0.0	0.0	0.0	0.0	0.0	5.8	8.3	0.0
PLAIN STICK-DULL	0.0	0.0	0.0	0.0	0.0	17.3	8.3	17.2
PLAIN TOOL RAG	0.0	0.0	0.0	0.0	35.7	1.9	5.6	10.3
PLAIN TOOL-CHISEL	0.0	0.0	0.0	0.0	14.3	11.5	8.3	6.9
PLAIN TOOL-DULL	0.0	0.0	0.0	0.0	21.4	13.5	13.9	20.7
PLAIN PADDLE END	0.0	0.0	0.0	0.0	7.1	32.7	38.9	31.0
PLAIN PADDLE EDGE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PL. PADDLE CORNER	0.0	0.0	0.0	0.0	7.1	5.8	5.6	3.4
CW PADDLE END	0.0	0.0	0.0	0.0	0.0	3.8	2.8	0.0
CW PADDLE CORNER	0.0	0.0	0.0	0.0	0.0	1.9	5.6	0.0
BAND 1 TOOL ANGLE:								
STRAIGHT IN	0.0	0.0	0.0	0.0	42.9	78.8	61.1	75.9
ANGLED LEFT	0.0	0.0	0.0	0.0	7.1	0.0	2.8	6.9
ANGLED RIGHT	0.0	0.0	0.0	0.0	42.9	3.8	11.1	3.4
ANGLED UP	0.0	0.0	0.0	0.0	7.1	17.3	25.0	13.8
BAND 1 ELEMENT SHAPE:								
RECTANGULAR	0.0	0.0	0.0	0.0	78.6	57.7	69.4	58.6
SQUARE	0.0	0.0	0.0	0.0	0.0	7.7	11.1	10.3
OVoid	0.0	0.0	0.0	0.0	14.3	23.1	13.9	24.1
HEMISPHERE	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.0
WEDGE/TRIANGLE	0.0	0.0	0.0	0.0	7.1	7.7	5.6	6.9
CRESCENT	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.0

Table 6 (cont'd).

CLUSTER NUMBER	1	2	3	4	5	6/7	8	9/10
BAND 1 ELEMENT ROBUSTNESS:								
SHALLOW	0.0	0.0	0.0	0.0	21.4	5.8	5.6	0.0
MEDIUM	0.0	0.0	0.0	0.0	64.3	21.2	41.7	31.0
DEEP	0.0	0.0	0.0	0.0	14.3	73.1	52.8	69.0
BAND ELEMENT ORIENTATION:								
VERTICAL	0.0	0.0	0.0	0.0	57.1	53.8	50.0	41.4
HORIZONTAL	0.0	0.0	0.0	0.0	7.1	0.0	2.8	0.0
OBLIQUE RIGHT	0.0	0.0	0.0	0.0	35.7	46.2	33.3	51.7
OBLIQUE LEFT	0.0	0.0	0.0	0.0	0.0	0.0	13.9	6.9
BAND 2 DECORATION:								
YES	0.0	0.0	0.0	0.0	92.9	5.8	0.0	0.0
NO	0.0	0.0	0.0	0.0	7.1	94.2	100.0	100.0
BAND 2 LOCATION:								
RIM	0.0	0.0	0.0	0.0	14.3	0.0	0.0	0.0
COLLAR	0.0	0.0	0.0	0.0	71.4	5.8	0.0	0.0
NECK/SHOULDER	0.0	0.0	0.0	0.0	7.1	0.0	0.0	0.0
BAND 2 POSITION:								
TOP	0.0	0.0	0.0	0.0	14.3	0.0	0.0	0.0
MIDDLE	0.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0
BOTTOM	0.0	0.0	0.0	0.0	14.3	5.8	0.0	0.0
ENTIRE	0.0	0.0	0.0	0.0	7.1	0.0	0.0	0.0
SPANS	0.0	0.0	0.0	0.0	7.1	0.0	0.0	0.0

Table 6 (cont'd).

CLUSTER NUMBER	1	2	3	4	5	6/7	8	9/10
BAND 2 NUMBER OF ROWS:								
ONE	0.0	0.0	0.0	0.0	64.3	5.8	0.0	0.0
TWO OR MORE	0.0	0.0	0.0	0.0	28.6	0.0	0.0	0.0
BAND 2 TYPE:								
PUNCTATE	0.0	0.0	0.0	0.0	78.6	5.8	0.0	0.0
IMPRESSED	0.0	0.0	0.0	0.0	14.3	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAND 2 MOTIF:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ROW OF ELEMENTS	0.0	0.0	0.0	0.0	92.9	5.8	0.0	0.0
BAND 2 TOOL:								
CW STICK EDGE	0.0	0.0	0.0	0.0	7.1	0.0	0.0	0.0
PLAIN STICK-DULL	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.0
PLAIN TOOL RAG	0.0	0.0	0.0	0.0	7.1	0.0	0.0	0.0
PLAIN TOOL-DULL	0.0	0.0	0.0	0.0	14.3	0.0	0.0	0.0
PLAIN PADDLE END	0.0	0.0	0.0	0.0	28.6	0.0	0.0	0.0
PL. PADDLE CORNER	0.0	0.0	0.0	0.0	35.7	0.0	0.0	0.0
BAND 2 TOOL ANGLE:								
STRAIGHT IN	0.0	0.0	0.0	0.0	35.7	3.8	0.0	0.0
ANGLED RIGHT	0.0	0.0	0.0	0.0	21.4	0.0	0.0	0.0
ANGLED UP	0.0	0.0	0.0	0.0	35.7	1.9	0.0	0.0

Table 6 (cont'd).

CLUSTER NUMBER	1	2	3	4	5	6/7	8	9/10
BAND 2 ELEMENT SHAPE:								
RECTANGULAR	0.0	0.0	0.0	0.0	35.7	0.0	0.0	0.0
CIRCULAR	0.0	0.0	0.0	0.0	0.0	3.8	0.0	0.0
OVOID	0.0	0.0	0.0	0.0	21.4	1.9	0.0	0.0
WEDGE/TRIANGLE	0.0	0.0	0.0	0.0	35.7	0.0	0.0	0.0
BAND 2 ROBUSTNESS:								
MEDIUM	0.0	0.0	0.0	0.0	21.4	1.9	0.0	0.0
DEEP	0.0	0.0	0.0	0.0	71.4	3.8	0.0	0.0
BAND 2 ELEMENT ORIENTATION:								
VERTICAL	0.0	0.0	0.0	0.0	57.1	5.8	0.0	0.0
OBLIQUE RIGHT	0.0	0.0	0.0	0.0	28.6	0.0	0.0	0.0
OBLIQUE LEFT	0.0	0.0	0.0	0.0	7.1	0.0	0.0	0.0
N OF CASES	19	14	16	18	14	52	36	29

Skegemog Plain is represented by 67 vessels in the collection (Figures 15, 17-19; Table 6). This type is partitioned into two primary varieties (Undecorated Lip and Decorated Lip), each of which is further subdivided into two sub-varieties (Uncollared and Collared). Although the clustering measures and methods employed in this analysis are polythetic agglomerative in nature, the divisions in the lower levels of the dendrogram almost take on the appearance of a monothetic classification (Table 6). Each of the varieties and their sub-varieties are briefly described below.

Skegemog Plain (Figures 15, 17-19; Table 6): Skegemog Plain vessels totally lack decoration on the exterior of the vessel. Internal differentiation of this type of Skegemog ware hinges first on the presence or absence of lip decoration and then on combined characteristics of vessel morphology and decoration.

Thirty-three vessels have been assigned to the type Skegemog Plain, variety Undecorated Lip (Figure 17). As noted above, this group is differentiated into two sub-groups based on the presence or absence of a collared rim. The exteriors of these vessels are cordmarked and the cordmarking is frequently executed with fine cord-wrapped paddles. Lip profiles are overwhelmingly flat and are smoothed in about half of the cases. Rims tend to be short and straight with little or no eversion. The degree of eversion on the collared group tends to be greater than on the uncollared group. Collars are round and short, and may be either weakly or well-defined.

The second variety, Skegemog Plain, variety Decorated Lip is distinguished by the presence of decoration on either the surface or the exterior margin of the lip and by the employment of slightly coarser cordmarking on the vessel exterior (Figures 18 and 19). Again, this variety subdivides into two groups based on the presence of collaring and decoration on the interior of the rim. With the uncollared sub-variety, lip profiles tend to be splayed, while on the collared form they tend to be flat. Lips are almost always smoothed and are not everted. Rim shapes are divided about two-thirds and one-

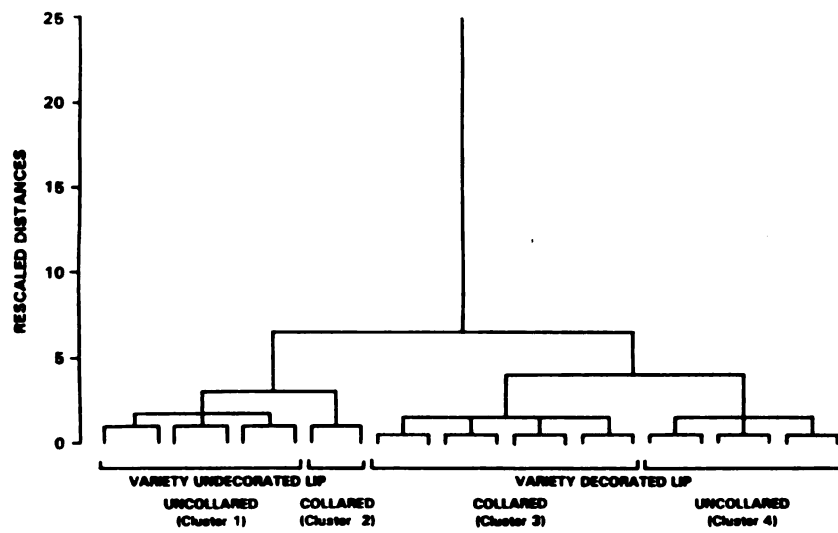


Figure 15. Skegemog Plain Dendrogram

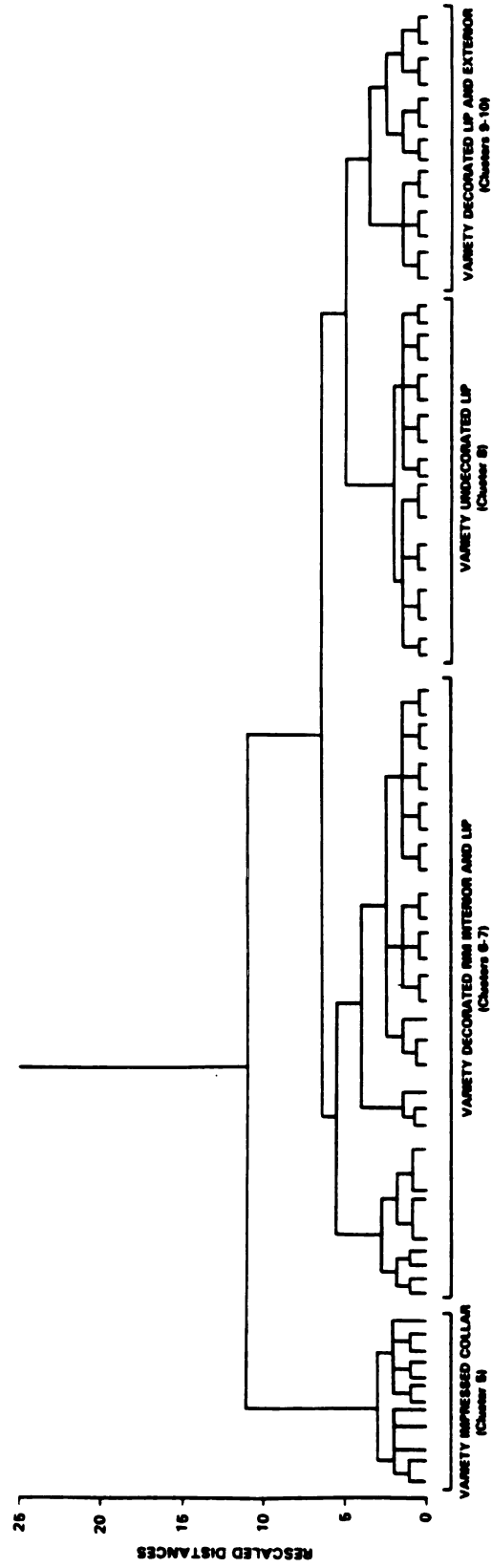


Figure 16.

Figure 16. Skegemog Decorated Dendrogram

Figure 17. Skegemog Plain, Variety Undecorated

Row 1: Sub-Variety Collared

Row 2: Sub-Variety Uncollared

Figure 18. Skegemog Plain, Variety Decorated Lip, Sub-Variety Uncollared

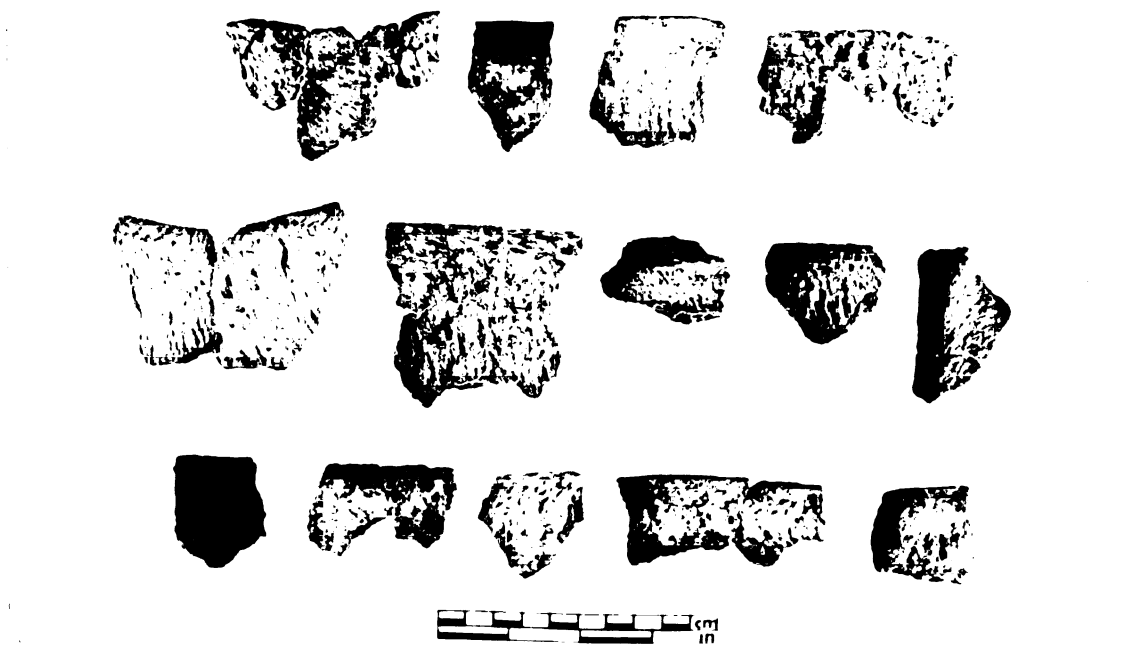


Figure 17.



Figure 18.

third between straight and curved shapes, respectively. The degree of rim eversion is mostly moderate and the rims are short. Collar profiles tend to be round, although there are a few occurrences of square-shaped collars.

Lip decoration occurs in the form of vertical, rectangular, linear or ovoid impressions. A limited range of tool types are used, primarily cordwrapped stick edges or plain tool ends. The presence of decoration on the interior of the vessel rim occurs only on the uncollared form of Skegemog Plain, variety Decorated Lip. It does, however, occur on all of the vessels assigned to the collared sub-variety. Rim interior decoration generally consists of a single row of rectangular or ovoid tool impressions located at the top of the rim. The decorative elements may be oriented either vertically or oblique left.

Skegemog Decorated (Figures 16, 20-27; Table 6): The remaining 131 vessels analyzed here are assigned to the type Skegemog Decorated. Skegemog Decorated is, in turn, composed of four main varieties: Impressed Collar, Decorated Rim Interior and Lip, Undecorated Lip, and Decorated Lip and Exterior. The varieties are differentiated from one another primarily by the location(s) of decoration on the vessel and its form. Medium to coarse cordmarking predominates on the vessel exteriors, although 30% to 40% of the vessels exhibit fabric impressed surfaces. As noted above, fabric impressed surfaces are visually quite similar to cordmarked surfaces. Flat lips and smoothed lip surfaces also predominate with these vessels, although each of the sub-varieties exhibit different amounts of variability in these attributes. The degree of rim eversion and lip eversion is also highly variable across these vessels.

Decoration occurs on the lips, rim interiors, and exteriors of these vessels. The occurrence of decoration in the former two fields is somewhat variable, while it is not with the latter fields. The exterior field used, as well as the position within a field does, however, show variability on the decorated vessels. Each of the four variants and their primary distinguishing characteristics are described as follows.

- Figure 19. Skegemog Plain, Variety Decorated Lip, Sub-Variety Uncollared
- Figure 20. Skegemog Decorated, Variety Impressed Collar

Figure

Figure



Figure 19.



Figure 20.

- Figure 21. Skegemog Decorated, Variety Decorated Rim Interior and Lip
- Figure 22. Skegemog Decorated, Variety Decorated Rim Interior and Lip

Figure

Figure



Figure 21.



Figure 22.

- Figure 23. Skegemog Decorated, Variety Decorated Rim Interior and Lip
- Figure 24. Skegemog Decorated, Variety Undecorated Lip

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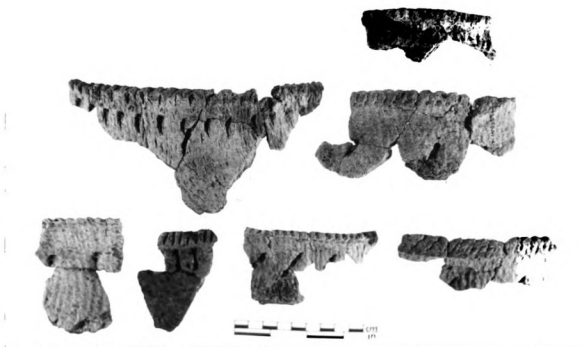


Figure 23.

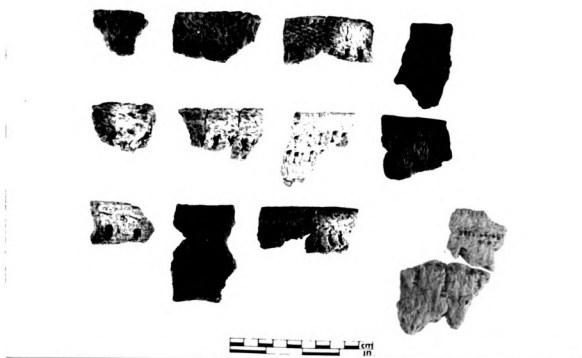


Figure 24.

- Figure 25. Skegemog Decorated, Variety Undecorated Lip
- Figure 26. Skegemog Decorated, Variety Decorated Lip and Exterior

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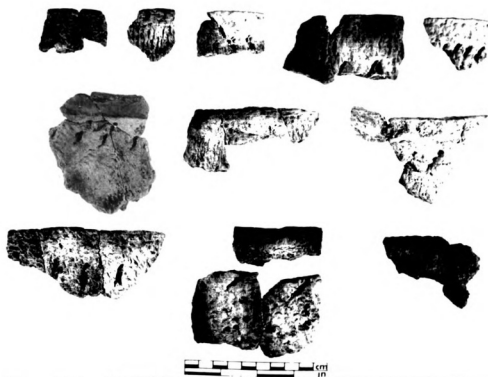


Figure 25.

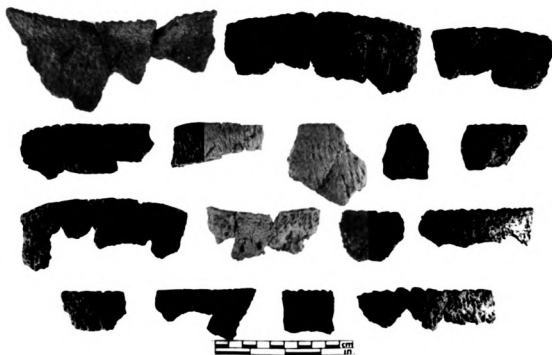


Figure 26.

Figure 27. Skegemog Decorated, Variety Decorated Lip and Exterior

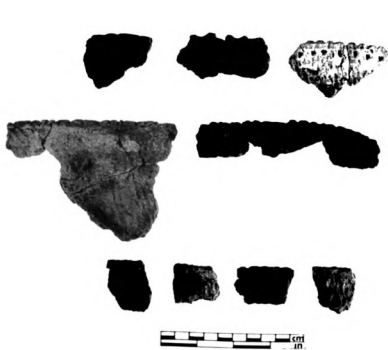


Figure 27.

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Skegemog Decorated, variety Impressed Collar (Figure 20; Table 6), is represented by 14 vessels. This variety is distinguished by the presence of impressed decoration on the vessel collar, the occurrence of a second decorative band on the vessel neck, occasional decoration of the lip, and mostly undecorated rim interiors. Morphologically, these vessels tend to have non-everted lips, straight collared rims with no or only a slight degree of eversion. Collars almost invariably have a rounded profile.

Lip decoration occurs on only 50% percent of the vessels assigned to the Impressed Collar variety. It is located on the lip surface and consists of vertical or oblique rectangular or linear tool impressions. Only two vessels exhibit decoration on the rim interior.

Some of the most structurally complex exterior decoration found on Skegemog wares occurs on these vessels. The first band of decoration almost always occurs at either the top of the collar or fills the upper portions of the rim. It is composed of a single row of generally rectangular tool impressions oriented either vertically or oblique right. The second band of decoration typically occurs in the center of the neck, although on several specimens it is located at the top or the bottom of the neck. Band 2 is generally composed of a single row of deep, vertical, rectangular or wedge/triangular-shaped punctates executed with a paddle end or edge. Occasionally, multiple rows are used. In these instances, the rows tend to be placed very close together.

Skegemog Decorated, variety Decorated Rim Interior and Lip, is the most abundant variety of the decorated Skegemog wares with 52 vessels assigned to it (Figures 21-23; Table 6). Typically, decoration is present in all three major fields; rim interior, lip, and exterior, specifically the neck. Before summarizing the nature of the decoration on these vessels it should be noted that two sub-varieties were weakly expressed. They are differentiated from one another by the occurrence of splayed lips,

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a greater frequency of lip eversion, curved rim shapes, greater degrees of rim eversion and a lesser frequency of rim interior decoration in one group and not the other. The group exhibiting these characteristics approximates the original Skegemog Curled Rim type (Cleland n.d.a.). Also when rim interior decoration is present on this particular sub-group, it usually consists of deep, horizontal rows of replied cord impressions.

Lip decoration is present on virtually all of the Decorated Rim Interior and Lip variety. It is usually located on surface or the exterior margin of the lip and consists of rectangular or linear plain tool impressions oriented either vertically or oblique right. Exterior decoration typically consists of a single row of medium to deep, vertical or oblique right, rectangular or ovoid punctates or impressions located in the center or at the top of the neck. Decorative elements are usually executed with either a plain, dull ended tool or a plain paddle end.

The third variety of decorated Skegemog ware has been named Skegemog Decorated, variety Undecorated Lip (Figures 24 and 25; Table 6). As the name implies, it is differentiated from the other varieties primarily by a general lack of decoration on the vessel lip. These vessels have flat, generally smoothed lips that are everted on about 30% of the vessels. Rims tend to be straight with either straight (61.1%) or collared (33.3%) rims that are slightly to moderately everted.

While lip decoration is not totally absent on this variety, it is present on only four of the 36 vessels assigned to this group. Rim interior decoration is totally lacking. As with the previous variety, exterior decoration is typically located in the center or at the bottom of the neck, consisting of a single row of punctates.

The final identified variety, Skegemog Decorated, variety Decorated Lip and Exterior (Figures 26 and 27; Table 6), is represented by 29 vessels. This variety is the only one with an appreciable amount of rounded lip profiles. Most of the vessels exhibit short or medium height round collars on slightly everted rims. Lips are invariably decorated, typically on the surface with vertical, ovoid tool impressions.

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Four of the vessels exhibit decoration on the interior of the rim. As is typical for Skegemog ware, exterior decoration is located on the neck. Decoration consists of a single row of rectangular or, occasionally, ovoid tool punctates.

Traverse Ware

A total of 307 vessels form the sample for the classification of the Traverse ware. The sample used in this analysis departs somewhat in its general characteristics from the vessels used in the original classification (Cleland n.d.a). These differences lie primarily in the area of paste and temper characteristics. The texture of the paste employed in the manufacture of these vessels is about equally split among coarse sandy, fine sandy, and silty pastes. The density of the pastes is likewise fairly evenly distributed between friable, moderately compact, and compact varieties. Only a small number of the vessels have pastes which could be characterized as very compact. While the temper employed does tend toward the coarse end of the scale, nearly half of the vessels had temper percentages of 10% or less. Approximately only 10% of the vessels have temper quantities in excess of 20%.

The attribute list employed in the classification of these ceramics is presented in Table 4. As with the other two ceramic wares, the primary division occurs between vessels lacking exterior decoration and those with exterior decoration. Each of these, in turn, is made up of a series of varieties and sub-varieties. The resultant dendrograms for Traverse Plain and Traverse Decorated are illustrated in Figures 28 and 29. The classification is presented below.

Traverse Plain (Figures 28, 30-38; Table 7): Slightly more than 55% of Traverse ware at Skegemog Point is classified as Traverse Plain. The 173 vessels making up this type of Traverse ware are sub-divided into two broad varieties: Scalloped (N=90 vessels) and Decorated Lip (N=83 vessels).

Table 7. Attribute Frequencies for the Traverse Ware Clusters

CLUSTER NUMBER	1	2-3	4-9	10-11	12	13-14	15	16	17	18
PASTE TEXTURE:										
COARSE SAND	30.3	31.6	32.5	24.0	25.0	32.1	23.1	44.4	30.0	41.7
FINE SAND	39.4	40.4	43.4	36.0	32.1	46.4	15.4	33.3	40.0	25.0
SILTY	30.3	28.1	24.1	40.0	42.9	21.4	61.5	22.2	30.0	33.3
PASTE DENSITY:										
FRIABLE	33.3	35.1	36.1	24.0	25.0	39.3	7.7	33.3	40.0	25.0
MOD. COMPACT	24.2	22.8	27.7	32.0	42.9	39.3	46.2	22.2	40.0	8.3
COMPACT	33.3	36.8	32.5	44.0	28.6	17.9	38.5	38.9	20.0	58.3
VERY COMPACT	9.1	5.3	3.6	0.0	3.6	3.6	0.0	5.6	0.0	8.3
TEMPER SIZE:										
FINE	9.1	15.8	12.0	12.0	10.7	17.9	0.0	11.1	0.0	25.0
MEDIUM	51.5	54.4	50.6	28.0	50.0	50.0	38.5	44.4	50.0	41.7
COARSE	39.4	29.8	37.3	60.0	39.3	32.1	61.5	44.4	50.0	33.3
TEMPER PERCENT:										
1-3%	15.2	5.3	10.8	16.0	10.7	7.1	0.0	11.1	0.0	16.7
5-10%	48.5	49.1	38.6	52.0	50.0	64.3	53.8	50.0	70.0	50.0
11-19%	15.2	22.8	32.5	24.0	21.4	7.1	7.7	22.2	30.0	8.3
20+%	21.2	22.8	18.1	8.0	17.9	21.4	38.5	16.7	0.0	25.0
EXTERIOR ZONING:										
YES	24.2	49.1	18.1	64.0	50.0	53.6	23.1	16.7	60.0	25.0
NO	75.8	50.9	81.9	36.0	50.0	46.4	76.9	83.3	40.0	75.0

Table 7 (cont'd).

CLUSTER NUMBER	1	2-3	4-9	10-11	12	13-14	15	16	17	18
SURFACE TREATMENT:										
FINE CORDMARK	0.0	1.8	2.4	4.0	0.0	14.3	0.0	0.0	20.0	0.0
MEDIUM CORDMARK	6.1	12.3	8.4	16.0	25.0	3.6	15.4	5.6	10.0	0.0
COARSE CORDMARK	21.2	17.5	16.9	36.0	10.7	17.9	7.7	33.3	40.0	8.3
FABRIC	0.0	5.3	8.4	0.0	0.0	0.0	7.7	11.1	10.0	0.0
SM. FINE CORDMARK	0.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.3
SM. MED. CORDMARK	9.1	5.3	7.2	4.0	3.6	7.1	7.7	5.6	10.0	0.0
SM. COARSE CORDMARK	9.1	15.8	4.8	8.0	17.9	3.6	0.0	11.1	0.0	0.0
SM. FABRIC	6.1	1.8	4.8	0.0	0.0	3.6	0.0	11.1	0.0	0.0
SMOOTH	48.5	36.8	47.0	32.0	42.9	50.0	61.5	22.2	10.0	83.3
EXTERIOR PATTERN:										
1	0.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	3.5	3.6	8.0	10.7	7.1	7.7	5.6	10.0	8.3
4	0.0	0.0	1.2	0.0	0.0	0.0	7.7	5.6	0.0	0.0
6	3.0	1.8	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	0.0	0.0	0.0	0.0	0.0	3.6	0.0	0.0	0.0	0.0
11	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	6.1	7.0	3.6	4.0	10.7	14.3	0.0	0.0	30.0	0.0
14	3.0	7.0	0.0	16.0	0.0	3.6	0.0	0.0	0.0	0.0
15	3.0	1.8	0.0	8.0	0.0	0.0	0.0	0.0	10.0	0.0
16	3.0	10.5	3.6	16.0	17.9	10.7	7.7	5.6	0.0	0.0

Table 7 (cont'd).

CLUSTER NUMBER	1	2-3	4-9	10-11	12	13-14	15	16	17	18
17	0.0	3.5	1.2	0.0	0.0	3.6	0.0	0.0	0.0	0.0
18	0.0	7.0	0.0	8.0	14.3	0.0	0.0	0.0	0.0	0.0
19	0.0	1.8	0.0	8.0	0.0	0.0	0.0	0.0	0.0	8.3
20	0.0	1.8	0.0	0.0	0.0	3.6	0.0	0.0	10.0	0.0
21	0.0	1.8	1.2	0.0	0.0	3.6	0.0	0.0	0.0	0.0
22	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23	15.2	3.5	24.1	0.0	0.0	0.0	7.7	50.0	10.0	0.0
24	9.1	5.3	2.4	0.0	0.0	0.0	7.7	0.0	20.0	0.0
25	0.0	1.8	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	3.0	1.8	2.4	0.0	3.6	0.0	0.0	0.0	0.0	0.0
29	0.0	1.8	2.4	0.0	0.0	0.0	0.0	5.6	0.0	0.0
30	3.0	0.0	2.4	0.0	0.0	3.6	0.0	5.6	0.0	0.0
31	48.5	35.1	47.0	32.0	42.9	46.4	61.5	22.2	10.0	83.3
LIP FORM:										
FLAT	30.3	42.1	74.7	52.0	21.4	82.1	76.9	88.9	80.0	66.7
SCALLOPED	63.6	47.4	7.2	8.0	42.9	10.7	23.1	5.6	0.0	8.3
PEAKED	6.1	10.5	13.3	40.0	32.1	7.1	0.0	0.0	20.0	0.0
CASTELLATED	0.0	0.0	4.8	0.0	3.6	0.0	0.0	5.6	0.0	25.0
LIP PROFILE:										
FLAT	12.1	64.9	30.1	52.0	25.0	35.7	53.8	44.4	40.0	75.0
ROUND	57.6	17.5	19.3	12.0	25.0	42.9	7.7	11.1	10.0	8.3
WEDGE	6.1	1.8	10.8	12.0	7.1	0.0	0.0	5.6	0.0	0.0
BEVELED	9.1	10.5	19.3	12.0	14.3	14.3	30.8	27.8	50.0	8.3

Table 7 (cont'd).

CLUSTER NUMBER	1	2-3	4-9	10-11	12	13-14	15	16	17	18
SPLAYED	9.1	1.8	7.2	4.0	0.0	0.0	0.0	5.6	0.0	8.3
ROLLED	6.1	3.5	13.3	8.0	25.0	7.1	7.7	5.6	0.0	0.0
LIP TREATMENT:										
FINE CORDMARK	3.0	3.5	0.0	0.0	3.6	0.0	0.0	0.0	100.0	0.0
MEDIUM CORDMARK	0.0	12.3	1.2	0.0	10.7	0.0	23.1	0.0	0.0	0.0
COARSE CORDMARK	3.0	26.3	0.0	0.0	28.6	0.0	7.7	0.0	0.0	0.0
FABRIC	0.0	3.5	0.0	0.0	3.6	0.0	7.7	0.0	0.0	0.0
SM. FINE CORDMARK	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SM. MED. CORDMARK	0.0	7.0	0.0	4.0	3.6	0.0	0.0	0.0	0.0	0.0
SM. COARSE CORDMARK	0.0	0.0	1.2	0.0	0.0	0.0	0.0	5.6	0.0	0.0
SM. FABRIC	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SMOOTH	93.9	43.9	97.6	96.0	46.4	100.0	61.5	94.4	0.0	100.0
RIM SHAPE:										
STRAIGHT	97.0	96.5	94.0	100.0	100.0	100.0	76.9	94.4	100.0	100.0
CURVED	3.0	1.8	6.0	0.0	0.0	0.0	23.1	5.6	0.0	0.0
RIM PROFILE:										
STRAIGHT	78.8	28.1	65.1	48.0	46.4	14.3	23.1	38.9	30.0	25.0
WEDGE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
THICKEN TO LIP	18.2	0.0	3.6	0.0	7.1	0.0	7.7	0.0	0.0	0.0
COLLARED	3.0	71.9	31.3	52.0	46.4	85.7	69.2	61.1	70.0	75.0

Table 7 (cont'd).

CLUSTER NUMBER	1	2-3	4-9	10-11	12	13-14	15	16	17	18
RELATIVE RIM HEIGHT:										
SHORT	39.4	29.8	32.5	20.0	21.4	42.9	23.1	11.1	0.0	16.7
MEDIUM	42.4	57.9	62.7	72.0	67.9	46.4	76.9	88.9	70.0	75.0
HIGH	18.2	12.3	4.8	8.0	10.7	10.7	0.0	0.0	30.0	8.3
RIM EVERSION:										
NONE	27.3	10.5	32.5	28.0	28.6	46.4	23.1	22.2	20.0	16.7
SLIGHT	33.3	49.1	49.4	56.0	60.7	39.3	53.8	38.9	50.0	66.7
MEDIUM	18.2	24.6	13.3	16.0	7.1	10.7	23.1	33.3	30.0	16.7
GREAT	21.2	15.8	4.8	0.0	3.6	3.6	0.0	0.0	0.0	0.0
COLLAR PROFILE:										
SQUARE	0.0	21.1	10.8	20.0	17.9	10.7	23.1	5.6	0.0	8.3
WEDGE	0.0	45.6	16.9	24.0	25.0	71.4	38.5	55.6	70.0	66.7
ROUND	0.0	3.5	3.6	4.0	3.6	3.6	7.7	0.0	0.0	0.0
COLLAR DEFINITION:										
WEAK	0.0	43.9	15.7	28.0	21.4	46.4	38.5	61.1	30.0	50.0
GOOD	0.0	26.3	15.7	20.0	25.0	39.3	30.8	0.0	40.0	16.7
RELATIVE COLLAR HEIGHT:										
SHORT	0.0	50.9	22.9	28.0	21.4	42.9	30.8	16.7	10.0	16.7
MEDIUM	0.0	17.5	6.0	20.0	25.0	25.0	30.8	38.9	40.0	33.3
HIGH	0.0	1.8	2.4	0.0	0.0	17.9	7.7	5.6	20.0	16.7

Table 7 (cont'd).

CLUSTER NUMBER	1	2-3	4-9	10-11	12	13-14	15	16	17	18
LIP DECORATION:										
YES	0.0	0.0	100.0	96.0	21.4	92.9	0.0	94.4	40.0	83.3
NO	100.0	100.0	0.0	4.0	78.6	7.1	100.0	5.6	60.0	16.7
LIP LOCATION:										
SURFACE	0.0	0.0	55.4	48.0	0.0	50.0	0.0	77.8	30.0	58.3
INTERIOR	0.0	0.0	0.0	0.0	3.6	3.6	0.0	0.0	0.0	0.0
EXTERIOR	0.0	0.0	12.0	4.0	10.7	10.7	0.0	0.0	10.0	0.0
INTERIO/EXTERIOR	0.0	0.0	18.1	4.0	7.1	10.7	0.0	5.6	0.0	0.0
INTERIOR/SURFACE	0.0	0.0	0.0	0.0	0.0	3.6	0.0	0.0	0.0	16.7
EXTERIOR/SURFACE	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CONTINUOUS	0.0	0.0	13.3	40.0	0.0	14.3	0.0	5.6	0.0	8.3
LIP TYPE:										
PUNCTATE	0.0	0.0	9.6	4.0	7.1	21.4	0.0	33.3	0.0	33.3
IMPRESSED	0.0	0.0	75.9	92.0	14.3	71.4	0.0	55.6	40.0	41.7
PINCHED	0.0	0.0	14.5	0.0	0.0	0.0	0.0	5.6	0.0	0.0
LIP TOOL:										
FINGER END/NAIL	0.0	0.0	25.3	32.0	3.6	0.0	0.0	5.6	40.0	8.3
CW STICK END	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CD-WRAPPED OBJECT	0.0	0.0	14.5	0.0	7.1	17.9	0.0	0.0	0.0	16.7
CORD	0.0	0.0	27.7	52.0	0.0	25.0	0.0	16.7	0.0	8.3
KNOT/KINKED CORD	0.0	0.0	0.0	0.0	0.0	3.6	0.0	0.0	0.0	0.0
PLAIN STICK-PT	0.0	0.0	1.2	0.0	0.0	3.6	0.0	0.0	0.0	0.0

Table 7 (cont'd).

CLUSTER NUMBER	1	2-3	4-9	10-11	12	13-14	15	16	17	18
PLAIN STICK-DULL	0.0	0.0	2.4	0.0	0.0	3.6	0.0	16.7	0.0	0.0
PLAIN STICK EDGE	0.0	0.0	6.0	0.0	0.0	7.1	0.0	5.6	0.0	0.0
PLAIN TOOL-RAG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PLAIN TOOL-CHISEL	0.0	0.0	6.0	8.0	0.0	17.9	0.0	5.6	0.0	25.0
PLAIN TOOL-DULL	0.0	0.0	14.5	0.0	0.0	10.7	0.0	33.3	0.0	25.0
PLAIN TOOL EDGE	0.0	0.0	1.2	0.0	7.1	3.6	0.0	5.6	0.0	0.0
PLAIN PADDLE END	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	0.0	0.0
PLAIN PADDLE EDGE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CW PADDLE EDGE	0.0	0.0	1.2	4.0	3.6	0.0	0.0	0.0	0.0	8.3
LIP TOOL ANGLE:										
STRAIGHT IN	0.0	0.0	73.5	52.0	21.4	75.0	0.0	66.7	40.0	58.3
ANGLED LEFT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ANGLED RIGHT	0.0	0.0	1.2	4.0	0.0	3.6	0.0	16.7	0.0	0.0
PINCHED	0.0	0.0	12.0	0.0	0.0	0.0	0.0	5.6	0.0	16.7
LOOPED	0.0	0.0	13.3	40.0	0.0	14.3	0.0	5.6	0.0	0.0
LIP ELEMENT ROBUSTNESS:										
SHALLOW	0.0	0.0	24.1	8.0	3.6	25.0	0.0	27.8	0.0	8.3
MEDIUM	0.0	0.0	47.0	72.0	14.3	57.1	0.0	44.4	30.0	8.3
DEEP	0.0	0.0	28.9	16.0	10.7	10.7	0.0	22.2	10.0	58.3
LIP ELEMENT SHAPE:										
RECTANGULAR	0.0	0.0	14.5	4.0	10.7	14.3	0.0	38.9	0.0	16.7
RECT.-LINEAR	0.0	0.0	36.1	116.0	0.0	50.0	0.0	11.1	10.0	50.0

Table 7 (cont'd).

CLUSTER NUMBER	1	2-3	4-9	10-11	12	13-14	15	16	17	18
RIM INTERIOR MOTIF:										
ROW OF ELEMENTS	0.0	0.0	7.2	4.0	7.1	0.0	0.0	16.7	0.0	8.3
INTERRUPTED LINEAR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.3
RIM INTERIOR TOOL:										
FINGER END/NAIL	0.0	0.0	0.0	4.0	3.6	0.0	0.0	0.0	0.0	0.0
CW STICK WEDGE	0.0	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
KNOT/KINKED CORD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	0.0	0.0
PLAIN STICK-DULL	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PLAIN STICK EDGE	0.0	0.0	0.0	0.0	3.6	0.0	0.0	0.0	0.0	0.0
PLAIN TOOL-CHISEL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.7
PLAIN TOOL-DULL	0.0	0.0	2.4	0.0	0.0	0.0	0.0	5.6	0.0	0.0
PLAIN PADDLE END	0.0	0.0	1.2	0.0	0.0	0.0	0.0	5.6	0.0	0.0
RIM INTERIOR ELEMENT SHAPE:										
VOID	0.0	0.0	1.2	4.0	7.1	0.0	0.0	5.6	0.0	0.0
CIRCULAR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LINEAR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.3
RIM INTERIOR ELEMENT ORIENTATION:										
VERTICAL	0.0	0.0	6.0	4.0	3.6	0.0	0.0	11.1	0.0	0.0
HORIZONTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.3
OBLIQUE RIGHT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OBLIQUE LEFT	0.0	0.0	1.2	0.0	3.6	0.0	0.0	5.6	0.0	8.3

Table 7 (cont'd).

CLUSTER NUMBER	1	2-3	4-9	10-11	12	13-14	15	16	17	18
RIM INTERIOR ROBUSTNESS:										
SHALLOW	0.0	0.0	2.4	4.0	3.6	0.0	0.0	11.1	0.0	8.3
MEDIUM	0.0	0.0	4.8	0.0	0.0	0.0	0.0	5.6	0.0	8.3
DEEP	0.0	0.0	0.0	0.0	3.6	0.0	0.0	0.0	0.0	0.0
EXTERIOR DECORATION:										
YES	0.0	0.0	1.2	100.0	100.0	100.0	100.0	100.0	100.0	100.0
NO	100.0	100.0	98.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EXTERIOR DECORATIVE MOTIF:										
LINEAR-VERTICAL	0.0	0.0	0.0	100.0	100.0	100.0	100.0	100.0	100.0	41.7
LINEAR-OHL RIGHT	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	33.3
LINEAR-OHL LEFT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CURVILINEAR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.7
BAND 1 LOCATION:										
RIM	0.0	0.0	0.0	44.0	50.0	14.3	23.1	0.0	30.0	16.7
COLLAR	0.0	0.0	1.2	44.0	46.4	85.7	46.2	0.0	70.0	75.0
NECK	0.0	0.0	0.0	8.0	3.6	0.0	30.8	88.9	0.0	0.0
SHOULDER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RIM/NECK	0.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0
COLLAR/NECK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.1	0.0	0.0

Table 7 (cont'd).

CLUSTER NUMBER	1	2-3	4-9	10-11	12	13-14	15	16	17	18
BAND 1 POSITION:										
TOP	0.0	0.0	0.0	0.0	10.7	3.6	30.8	27.8	80.0	8.3
MIDDLE	0.0	0.0	0.0	8.0	14.3	0.0	23.1	55.6	0.0	0.0
BOTTOM	0.0	0.0	0.0	84.0	75.0	85.7	30.8	5.6	10.0	0.0
ENTIRE	0.0	0.0	1.2	0.0	0.0	10.7	15.4	0.0	10.0	66.7
SPANS	0.0	0.0	0.0	4.0	0.0	0.0	0.0	11.1	0.0	0.0
BAND 1 NUMBER OF ROWS:										
ONE	0.0	0.0	0.0	92.0	100.0	85.7	92.3	100.0	100.0	25.0
TWO OR MORE	0.0	0.0	1.2	8.0	0.0	17.9	7.7	0.0	0.0	66.7
BAND 1 TYPE:										
PUNCTATE	0.0	0.0	0.0	0.0	0.0	57.1	61.5	83.3	50.0	8.3
IMPRESSED	0.0	0.0	0.0	0.0	3.6	42.9	38.5	5.6	10.0	33.3
PINCHED	0.0	0.0	0.0	100.0	96.4	0.0	0.0	11.1	40.0	16.7
DRAG-JAB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.3
TRAILED	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAND 1 MOTIF:										
ROW OF ELEMENTS	0.0	0.0	0.0	100.0	100.0	96.4	100.0	100.0	100.0	25.0
CONTINUOUS LINEAR	0.0	0.0	0.0	0.0	0.0	3.6	0.0	0.0	0.0	25.0
CONT LIN & FIELD	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	8.3
INTERRUPTED LINEAR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.3

Table 7 (cont'd).

CLUSTER NUMBER	1	2-3	4-9	10-11	12	13-14	15	16	17	18
BAND 1 TOOL:										
FINGER END/NAIL	0.0	0.0	0.0	100.0	100.0	0.0	0.0	0.0	40.0	0.0
CWSTICK END	0.0	0.0	0.0	0.0	0.0	3.6	0.0	0.0	10.0	0.0
CW STICK EDGE	0.0	0.0	0.0	0.0	0.0	10.7	7.7	0.0	10.0	0.0
CORD	0.0	0.0	0.0	0.0	0.0	7.1	0.0	0.0	0.0	41.7
KNOT/KINKED CORD	0.0	0.0	0.0	0.0	0.0	10.7	0.0	0.0	0.0	0.0
PLAIN STICK-PT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PLAIN STICK-DULL	0.0	0.0	1.2	0.0	0.0	28.6	7.7	16.7	20.0	0.0
PLAIN STICK EDGE	0.0	0.0	0.0	0.0	0.0	0.0	7.7	0.0	0.0	0.0
PLAIN TOOL-RAG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PLAIN TOOL-CHISEL	0.0	0.0	0.0	0.0	0.0	10.7	23.1	0.0	0.0	33.3
PLAIN TOOL-DULL	0.0	0.0	0.0	0.0	0.0	25.0	23.1	44.4	20.0	16.7
PLAIN TOOL EDGE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PLAIN PADDLE END	0.0	0.0	0.0	0.0	0.0	3.6	0.0	0.0	0.0	0.0
PLAIN PADDLE EDGE	0.0	0.0	0.0	0.0	0.0	0.0	7.7	27.8	0.0	0.0
PL. PADDLE CORNER	0.0	0.0	0.0	0.0	0.0	0.0	7.7	0.0	0.0	0.0
BAND 1 TOOL ANGLE:										
STRAIGHT IN	0.0	0.0	1.2	0.0	0.0	57.1	15.4	11.1	0.0	0.0
ANGLED LEFT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ANGLED RIGHT	0.0	0.0	0.0	56.0	0.0	17.9	84.6	66.7	50.0	58.3
ANGLED UP	0.0	0.0	0.0	0.0	0.0	10.7	7.7	5.6	0.0	33.3
PINCHED	0.0	0.0	0.0	44.0	100.0	14.3	7.7	27.8	10.0	0.0

Table 7 (cont'd).

CLUSTER NUMBER	1	2-3	4-9	10-11	12	13-14	15	16	17	18
BAND 1 ELEMENT SHAPE:										
RECTANGULAR	0.0	0.0	0.0	0.0	0.0	21.4	53.8	83.3	40.0	0.0
CIRCULAR	0.0	0.0	0.0	0.0	0.0	25.0	7.7	0.0	20.0	16.7
OVOID	0.0	0.0	0.0	100.0	100.0	25.0	0.0	0.0	20.0	0.0
LINEAR	0.0	0.0	1.2	0.0	0.0	17.9	23.1	11.1	50.0	0.0
WEDGE/TRIANGLE	0.0	0.0	0.0	0.0	0.0	7.1	0.0	0.0	0.0	75.0
CRESCENT	0.0	0.0	0.0	0.0	0.0	3.6	15.4	5.6	0.0	0.0
BAND 1 ELEMENT ROBUSTNESS:										
SHALLOW	0.0	0.0	0.0	0.0	10.7	21.4	7.7	5.6	10.0	0.0
MEDIUM	0.0	0.0	1.2	24.0	50.0	46.4	15.4	5.6	10.0	25.0
DEEP	0.0	0.0	0.0	56.0	39.3	32.1	38.5	33.3	40.0	66.7
BAND 1 ELEMENT ORIENTATION:										
VERTICAL	0.0	0.0	0.0	24.0	92.9	50.0	46.2	61.1	50.0	0.0
HORIZONTAL	0.0	0.0	1.2	56.0	0.0	32.1	53.8	61.1	70.0	0.0
OBLIQUE RIGHT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OBLIQUE LEFT	0.0	0.0	0.0	20.0	7.1	17.9	0.0	0.0	0.0	50.0
BAND 2 DECORATION:										
YES	0.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	100.0	91.7
NO	0.0	0.0	0.0	52.0	100.0	0.0	0.0	0.0	0.0	8.3

Table 7 (cont'd).

CLUSTER NUMBER	1	2-3	4-9	10-11	12	13-14	15	16	17	18
BAND 2 ROBUSTNESS:										
SHALLOW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	25.0
MEDIUM	0.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	40.0	66.7
DEEP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0
BAND 2 ELEMENT ORIENTATION:										
VERTICAL	0.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	50.0	33.3
HORIZONTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0	25.0
OBLIQUE RIGHT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.7
OBLIQUE LEFT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.3
COMBINATION	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.3
N OF CASES	33	57	83	25	28	28	13	18	10	12

The first variety, *Traverse Undecorated*, variety *Scalloped* (Figures 30-35; Table 7), is somewhat variable in its composition and the name may be a bit misleading. The 90 vessels assigned to this variety are split into uncollared and collared sub-varieties. Furthermore, the former sub-variety generally lacks zoned exterior surface preparation, while the vessels in the latter sub-variety are zoned. In the case of the uncollared sub-variety, smooth surfaces predominate. The collared varieties also exhibit a high frequency of smoothed surfaces. A majority of those exhibiting surface treatment zoning with an intervening smooth zone between cordmarked zones. Cordmarking tends to be coarse. Of these vessels, approximately one-half of the vessels exhibit the distinctive scalloped lip. The remainder have flat lips, with only a very few exhibiting peaked lips. Lip profiles are also split between rounded and flat between the two sub-varieties. Rims are generally straight with slight to moderate degrees of eversion. *Traverse Plain*, variety *Scalloped* vessels lack interior and exterior decoration.

The second variety of plain *Traverse* ware is designated *Decorated Lip* (N=83) (Figures 36-38; Table 7). As the name implies, the presence of lip decoration distinguishes these vessels. The vessels tend not to be zoned and generally have either smooth or vertical coarse cordmarked surfaces. The lip is usually flat, although this variety exhibits one of the highest frequencies of vessels with peaked lips (13.2%). Nearly half of the vessels with castellated lips also occur within this variety. Castellations across the entire *Traverse* population are low and weakly developed. Lip profiles are split between flat, round, beveled and rolled. Most of the rims are straight, although nearly one-third are collared. Collars are generally wedge-shaped in profile and weakly defined.

Lip decoration occurs on all of the specimens. Its placement, however, is somewhat variable. Most frequently it occurs only on the surface of the lip. On 12% to

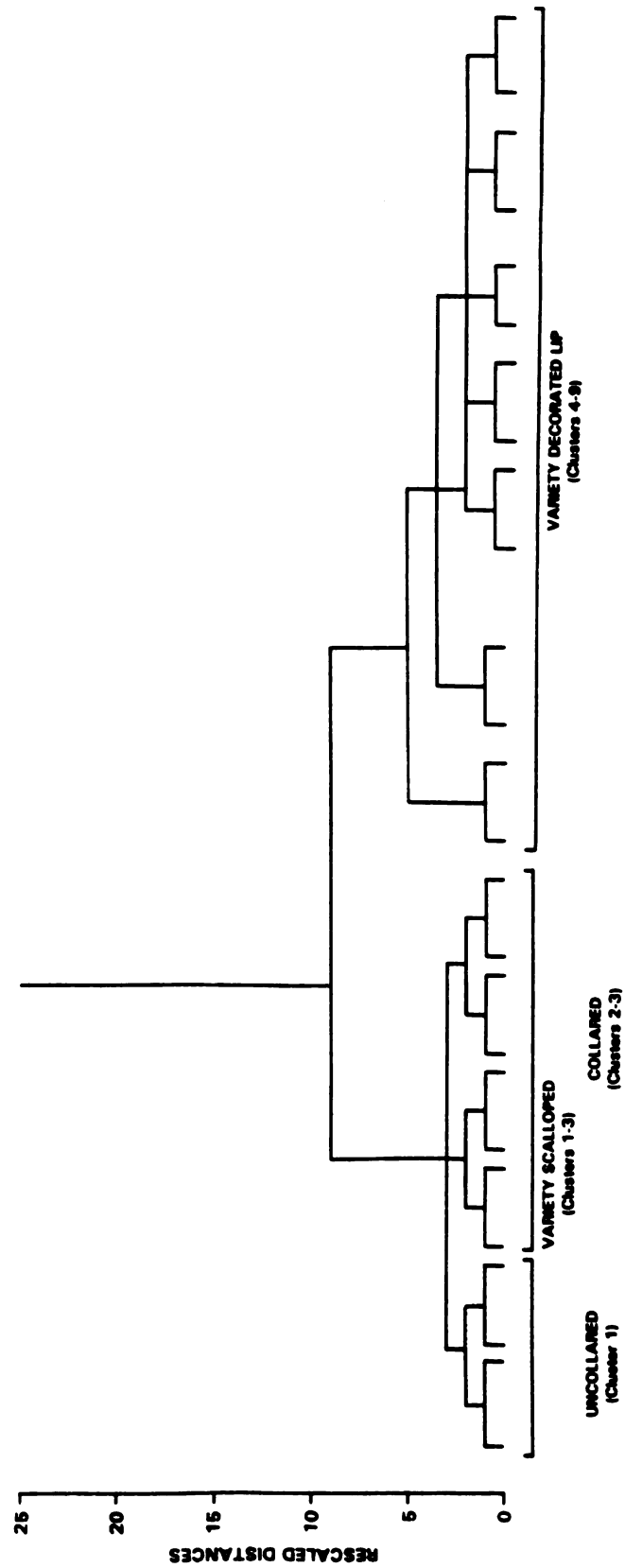


Figure 28. Dendrogram for Traverse Plain

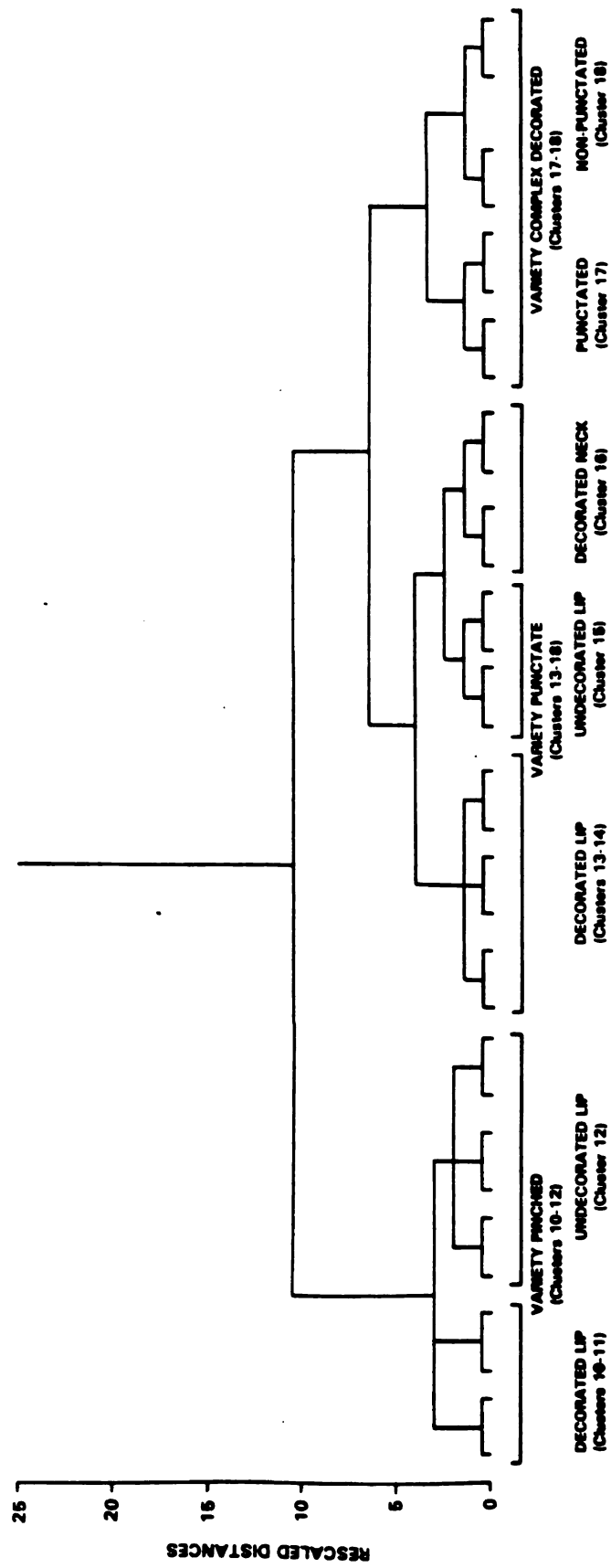


Figure 29. Dendrogram for Traverse Decorated.

- Figure 30. Traverse Plain, Variety Scalloped, Sub-Variety Uncollared
- Figure 31. Traverse Plain, Variety Scalloped, Sub-Variety Uncollared



Figure 30.

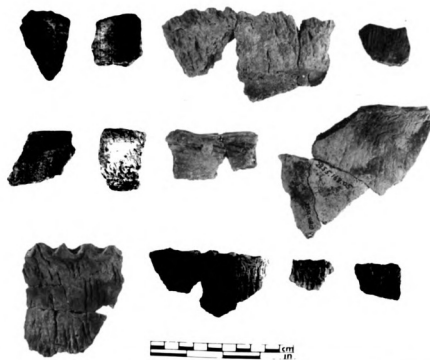


Figure 31.

Figure 32. Traverse Plain, Variety Scalloped, Sub-Variety Collared

Figure 33. Traverse Plain, Variety Scalloped, Sub-Variety Collared



Figure 32.



Figure 33.

Figure 34. Traverse Plain, Variety Scalloped, Sub-Variety Collared

Figure 35. Traverse Plain, Variety Scalloped, Sub-Variety Collared

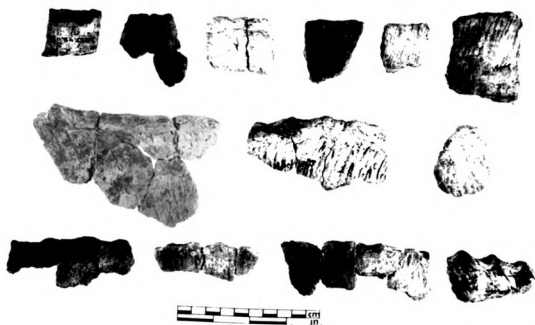


Figure 34.



Figure 35.

- Figure 36. Traverse Plain, Variety Decorated Lip
- Figure 37. Traverse Plain, Variety Decorated Lip

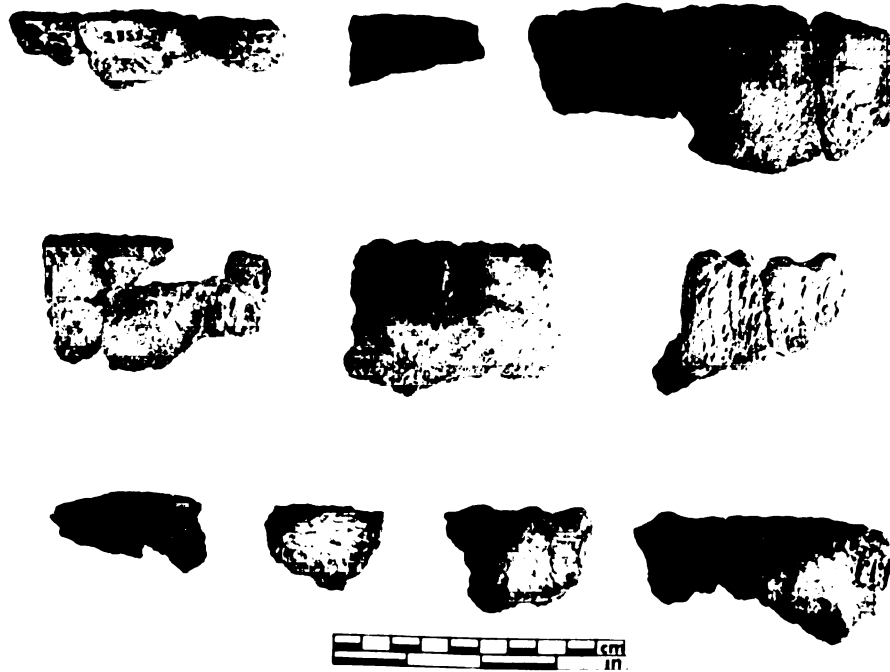


Figure 36.



Figure 37.

- Figure 38. Traverse Plain, Variety Decorated Lip
- Figure 39. Traverse Plain, Variety Decorated Lip



Figure 38.

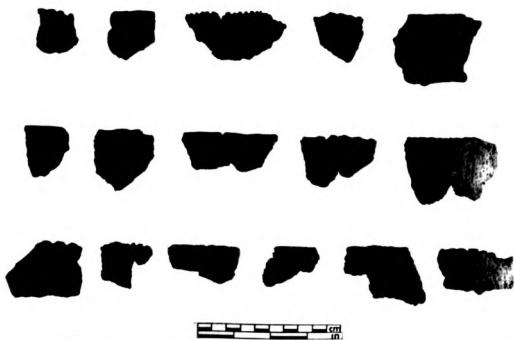


Figure 39.

19% of the vessels, it is placed on the exterior margin, on both the interior and the exterior margin, or is continuous from the interior to the exterior margin of the lip. In the latter two instances, lip decoration generally consists of marring the edge with either a cord or a plain tool, or looping a cord over the lip and impressing it. On nearly 15% of the vessels, the lip decoration is executed by pinching the lip between two fingers in order to form continuous, horizontal, ovoid impressions. These patterns of lip decoration are repeated in varying frequencies in the other types and varieties of Traverse ware with lip decoration.

Although the use of decoration on the interior of the rim is very infrequent in Traverse ware, nearly half of the 14 vessels with it clustered within this variety. The remaining vessels with interior rim decoration are scattered across the decorated varieties of Traverse ware.

Traverse Decorated (Figures 29, 39-46; Table 7): Traverse Decorated is represented by a total of 134 vessels divided into three primary varieties, which are composed of two sub-varieties each. As indicated by Cleland (n.d.a.), the decoration of Traverse ware is relatively simple in its structure, but elegantly executed. Traverse Decorated, variety Pinched (Figures 39-41; Table 7), largely carries over from the original classification. Fifty-three vessels represent this type. The two sub-varieties are termed Decorated Lip and Undecorated Lip. The vessels are nearly evenly divided between the two sub-varieties. As the name indicates, this type is characterized by the use of finger pinches in the execution of the exterior decoration. Both sub-varieties show fairly frequent employment of zoned exterior surface preparation. The different zones are usually set off from one another by a single or, occasionally, a multiple row of finger pinches. A majority of these vessel employ juxtaposed zones of smoothing and cordmarking on the exterior. Completely smoothed surfaces occur on slightly more than one-third of the specimens. When this occurs, the finger pinched decoration serves to set off the

- Figure 40. Traverse Decorated, Variety Pinched, Sub-Variety Undecorated Lip
- Figure 41. Traverse Decorated, Variety Pinched, Sub-Variety Undecorated Lip

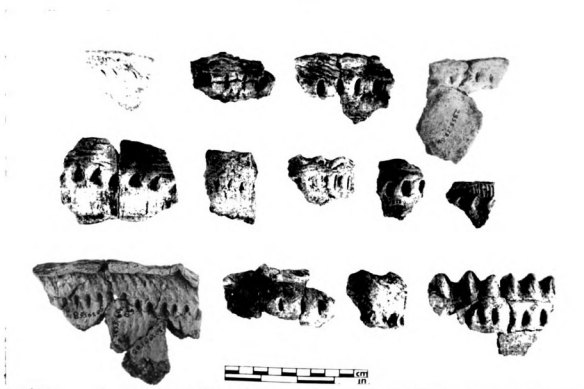


Figure 40.



Figure 41.

Figure 42. **Traverse Decorated, Variety Pinched, Sub-Variety Decorated ip**

Figure 43. **Traverse Decorated, Variety Pinched, Sub-Variety Decorated Lip**

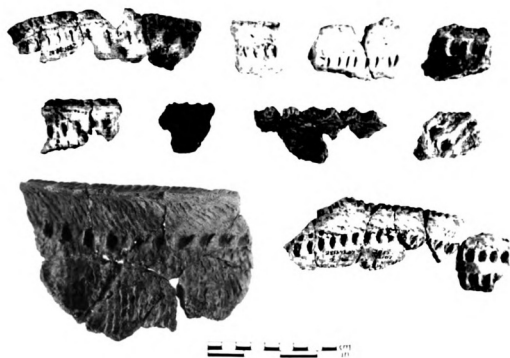


Figure 42.



Figure 43.

- Figure 44. Traverse Decorated, Variety Punctate, Sub-Variety Undecorated Lip
- Figure 45. Traverse Decorated, Variety Punctate, Sub-Variety Undecorated Lip



Figure 44.



Figure 45.

- Figure 46.** **Traverse Decorated, Variety Complex Decorated, Sub-Variety Punctated**
- Figure 47.** **Traverse Decorated, Variety Complex Decorated, Sub-Variety Non-Punctated**

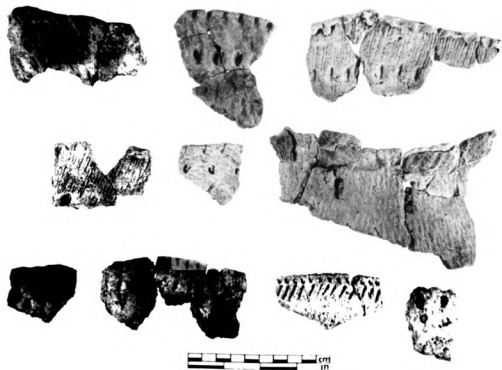


Figure 46.



Figure 47.

different vessel fields from one another. Exterior decoration is almost uniformly located on the rim/collar of the vessel, specifically at the bottom. Only rarely does it lie in the center or span a decorative field. Execution of the elements is generally medium to bold in robustness.

Beyond this point, however, the two varieties begin to diverge. Although the two sub-varieties are named according to the condition of the lip decoration, they actually differ more from one another in terms of the morphology of their lips. Within the Decorated Lip sub-variety, lip form is either flat or peaked. In the other sub-variety it is typically scalloped. The former vessels also tend to have flat lips, while the lip profiles of the Undecorated Lip sub-variety are more evenly distributed between flat, rounded, and rolled. Another difference occurs in the almost complete use of smoothed lip surfaces on the Decorated Lip group. Aspects of rim profile, relative height and degree of eversion are very similar between the two sub-varieties. That is, rims are evenly split between collared and uncollared forms, tend to be of medium height, and have slight to no eversion. Collars may be either wedge-shaped or square in cross-section.

Lip decoration, when it occurs, is located either on the surface of the lip or is continuous from the interior to the exterior margins. In either case, a cord looped over the lip or the end of the finger is the preferred tool. Thus, linear shapes perpendicular to the vessel orifice predominate. Decoration on the interior of the rim occurs on only three of the vessels in the Pinched variety.

The second variety of decorated Traverse ware is termed Punctate (N=59 vessels) and is divided into Decorated Lip (N=28 vessels) (Figures 42 and 43; Table 7), Undecorated Lip (N= 13 vessels) (Figure 44; Table 7), and Decorated Neck (N=18 vessels) (Figure 44; Table 7) sub-varieties. Overall, this variety is very similar to the Pinched variety in the simplicity of the decoration. Overall, these vessels generally do not employ zoning of the exterior surface treatment, have smooth

exteriors, flat lip forms and profiles, smoothed lip surfaces, and slightly everted, wedge-shaped collared rims of medium height. Only the Decorated Lip sub-variety diverges significantly from this pattern. It exhibits a significant frequency of rounded lip profiles and zoned exteriors. Additionally, all of the vessels in this variety exhibit only a single band of exterior decoration.

The first sub-variety, Decorated Lip, combines impressed lip decoration with either punctates or tool impressions along the bottom of the collar. Specifically, the exterior decoration tends to occur right along or just below the lower margin of the collar. Lip decoration generally occurs on the lip surface, but it also occurs in virtually every other combination of the lip sub-fields (Table 7). Decorative elements on the lip tend to be linear in shape and may be oriented either vertically or oblique right to the vessel orifice. On the exterior decoration no single element shape or orientation predominates. This sub-group also sees the most extensive use of multiple rows of elements within a band of decoration.

The second sub-variety, Undecorated Lip, combines plain, undecorated lips with exterior decoration. The location of the decoration on the vessel exterior is highly variable, as is the position of the decorative elements within the decorative fields (Table 7). Generally, plain tools are employed in the execution of the design. In contrast to the previous group, tools are usually applied to the surface of the vessel at an oblique angle.

The third sub-variety, Decorated Neck, is distinguished by the fact that the decoration is located almost invariably in the center of the neck and consists of a row of rectangular punctates. The lip surfaces of these vessels are also decorated with a variety of tool impressions.

The third and final variety of decorated Traverse ware is termed Complex Decoration (N=22 vessels) and is divided into Punctated (N=10 vessels) (Figure 45; Table 7) and Non-Punctated (N=12 vessels) (Figure 46; Table 7) sub-varieties. As the

name implies, these vessels are distinguished by relatively complex decorative motifs composed of a minimum of two bands.

Overall, the morphology of the vessels in these two sub-varieties and certain aspects of the decoration are very similar. Lip forms tend to be flat with squared profiles, rims generally have weak, wedge-shaped collars and are slightly everted. Morphologically, the sub-varieties differ in the following respects. Sub-variety Punctated has a slightly higher occurrence of zoned exteriors and the surface treatment is rarely smoothed. Furthermore, peaked lips may occur here, while the other sub-variety has a low frequency of castellated lips. Splayed lips are also associated with the first sub-variety and the lip surface is always cordmarked. Lip surfaces are always smoothed on vessels of the Non-Punctated sub-variety.

Lip decoration is much more frequent on sub-variety Non-Punctated vessels, although in either case when it does occur, it is generally in the form of rectangular or linear tool impressions created with the use of a limited range of tool types.

The form of the exterior decoration on the vessels is the primary difference between the two sub-variants of Traverse Complex Decorated. The decorative bands on sub-variety Punctate are formed by single rows of either rectangular plain tool or paddle punctates, or finger pinches on the vessel exterior. The first band is typically located at the top of the rim/collar and the second band is generally located at the base of the rim/collar or on the neck of the vessel. The vessels in the sub-variety that employ the use of finger pinching as the decorative device (Figure 44, first four specimens) bear close visual resemblance to some of the vessels classified as Traverse Pinched. The differentiating aspect here appears to be the number of bands involved and their location on the vessel exterior. Additionally, some of the other vessels in this group bear resemblance to the punctated variety of Traverse ware.

The second sub-variety of Traverse Decorated, variety Complex Decoration is represented by 12 vessels whose decoration is executed with the use of non-punctate

forms for the primary decorative elements or the combination of punctates with another form of execution including drag-jab, and impressing replied cords into the vessel surface. The first band of decoration is located on the rim/collar of the vessel and generally fills the field. The second band of decoration, however, may occur on any of the three primary fields for decoration and it shows a high degree of variability in terms of its placement within a particular field. The location of its placement is a function of the placement of the first decorative band.

DATING AND EXTERNAL RELATIONSHIPS OF THE CERAMIC WARES

So far, the three ceramic wares described from the Skegemog Point site have been placed within a general time frame. More specific dating of these ceramics is possible using the radiocarbon dates reported from the Skegemog Point site (see Appendix 1) and by comparison with other ceramic types in the state. Each of the three wares will be discussed in chronologic order.

Bowerman ware shows broad similarities with early Late Woodland Allegan and Wayne tradition ceramics found in the southern portion of Michigan (Brashler 1981; Cleland n.d.a.), and to a lesser degree with Spring Creek ware (Fitting 1968a). The specifics of the dating of Allegan ware are discussed in depth by Rogers (1972), Kingsley (1977), and Brashler (1981). The Allegan phase is considered to date to the period between A.D 600 and, possibly, as late as the thirteenth century A.D. The breadth of this time span led Kingsley (1977:143-155) to divide the Allegan phase into an early and a late phase. The Early Allegan phase is dated to between A.D. 600 and A.D. 900 (Kingsley 1977:143). The end of the late phase is anchored by two radiocarbon dates (A.D. 1180 and A.D. 1230) from the 46th Street site (Rogers 1972:90).

Brashler's (1981) study largely concurs with the above proposition and clearly shows that there are some general morphological and decorative trends through time in

the Allegan phase. As the phase progresses, collars, castellations, and rolled rims appear and increase in frequency. Thus, true collars do not appear until late in the phase. A similar situation is also seen with the appearance of exterior decoration on the vessels. Although Brashler (1981:332) emphasizes the intermediate nature of Bowerman ware between Mackinac ware and Spring Creek ware, a view that emphasizes the similarities between Allegan ware and Bowerman ware is favored here. This is predicated primarily on the nature of the differences between Allegan ware and Spring Creek ware that Brashler (1981) elucidated in her study.

Basically, Allegan ware sees a relatively low frequency of everted rims, collared rims, rolled lips, and decorated exteriors (Brashler 1981:244). While Spring Creek ware has an even lower frequency of decorated exteriors than Allegan wares, it does have the highest frequency of rolled and collared rims, and rim eversion (Brashler 1981:255). As discussed above, Bowerman ware is typically straight rimmed jars with little or no rim eversion, a low frequency of collaring, and a moderate frequency of exterior decoration. Furthermore, the low frequency of collaring and moderate level of exterior decoration in the Bowerman wares from the Skegemog Point site may be an indication that this represents an occupation dating to the period prior to about A.D. 900. The presence of projectile points that are transitional between the late Middle Woodland and the early later Woodland periods at the Skegemog Point site in addition to the A.D. 608 radiocarbon date (M-1868) from the Samels Field locale certainly make this a possibility. It must be stressed, however, that no ceramics were found in association with that radiocarbon date.

As initially pointed out by Cleland (n.d.a.), Skegemog ware shows a great deal of similarity with Mackinac ware described from the Juntunen site (McPherron 1967:86-97) and a lesser degree of similarity with Spring Creek ware (Fitting 1968a). As such, Skegemog ware is also associated with the earlier portions of the Late Woodland period. With the relatively high frequency of occurrence of rolled rims,

everted lips, splayed lip profiles, an emphasis on lip decoration and exterior decoration, Skegemog wares clearly show stronger similarity to the former ware group than to the latter. In fact, some of the Skegemog ware vessels, such as those with moderate to great degrees of rim eversion, splayed lips, and replied cord impressed decoration on the rim interior, would be very difficult to discriminate from Mackinac wares without an adequately large sample. The relatively bold execution of the decoration on Skegemog ware along with lesser amounts of exterior decoration and simpler design layouts does, however, help differentiate these two ware types. The paste of Mackinac ware also tends to be more compact and contains higher frequencies of coarse temper than does Skegemog ware.

Some of the Skegemog wares, however, do show strong resemblance to Spring Creek ware. These include the undecorated varieties with relatively straight collared rims. Varieties such as Skegemog Decorated, variety Impressed Collar appears to combine the attributes of the adjacent contemporaneous wares.

Additionally, at the Skegemog Point site, these ceramics are dated by a radiocarbon date of A.D. 910 (M-1865). This conforms well with radiocarbon dates reported from the Juntunen site (McPherron 1967) and the Spring Creek site (Fitting 1968a). The relevant radiocarbon dates are summarized in Table 8.

Just as changes in vessel form and decoration are seen in Brashler's (1981) sample of Spring Creek ware and McPherron's (1967) Mackinac ware, it would be unwise to view Skegemog ware as a monolithic, unchanging ceramic ware. The charting of the internal changes in Skegemog ware, however, is at this time unclear and the information needed to deal with temporal change is not currently available. Using the changes in Mackinac ware and Spring Creek ware documented by Brashler (1981) and McPherron (1967), some general expectations can be set up. Specifically, it is expected that the straighter rimmed varieties of Skegemog ware are associated with the

Table 8. Northern and Western Michigan Radiocarbon Dates

Site	Date No.	RCYBP*	CalibratedAge
Dumaw Creek	M-1070	280 $\pm$ 150	1642
Moccasin Bluff	M-1935	310 $\pm$ 100	1529, 1556, 1634
Wood	M-2058	320 $\pm$ 100	1525, 1563, 1628
Fauver	M-1866	340 $\pm$ 100	1516, 1599, 1618
O'Neil	M-2398	430 $\pm$ 100	1441
20GR91	B-10379	490 $\pm$ 50	1426
Henderson Lamb	M-2063	500 $\pm$ 100	1422
Boven	M-1768	480 $\pm$ 100	1329-1347
20GR91	B-9647	610 $\pm$ 40	1321, 1367, 1388
Skegemog Point	M-1864	630 $\pm$ 110	1304, 1371, 1384
Juntunen	M-1188	630 $\pm$ 75	1304, 1371, 1384
20GR91	Feature 1	660 $\pm$ 45	1284
O'Neil	M-2405	670 $\pm$ 100	1283
O'Neil	M-2406	740 $\pm$ 100	1277
Moccasin Bluff	M-1239	740 $\pm$ 110	1277
20GR91	B-10380	720 $\pm$ 50	1273
Missaukee Mound 2	M-790	750 $\pm$ 150	1264, 1268, 1276
Moccasin Bluff	M-1940	800 $\pm$ 110	1230, 1243, 1256
Juntunen	M-1817	820 $\pm$ 120	1219
Moccasin Bluff	M-1938	860 $\pm$ 110	1191
Skegemog Point	M-1863	865 $\pm$ 120	1164, 1169, 1190
Juntunen	M-1815	870 $\pm$ 120	1163, 1174, 1188
Fletcher	M-17750	875 $\pm$ 85	1162, 1179, 1187
Juntunen	M-1816	890 $\pm$ 120	1158
Moccasin Bluff	M-1937	890 $\pm$ 110	1158
Moccasin Bluff	M-1941	890 $\pm$ 110	1158
Schuler	M-1867	970 $\pm$ 120	1025
Spring Creek	M-512	990 $\pm$ 150	1021
Wood	M-2057	990 $\pm$ 120	1021
West Twin Lake	M-1084	1000 $\pm$ 100	1004, 1008, 1014
O'Neil	M-2401	1000 $\pm$ 140	1004, 1008, 1014
Juntunen	M-1141	1050 $\pm$ 150	990
Skegemog Point	M-1865	1100 $\pm$ 120	910, 915, 977
Juntunen	M-1142	1125 $\pm$ 150	897, 921, 940
Carrigan Mound A	M-1759	1270 $\pm$ 120	629, 699, 712
Samels Field	M-1868	1440 $\pm$ 120	608, 627, 638

* Radiocarbon years before present

earlier end of the Skegemog phase and that the amount of decoration and its complexity increases through time, as does the occurrence of collaring on the vessel exterior.

The final ceramic ware discussed here is Traverse ware. This ceramic group is dated at the Skegemog Point site by two radiocarbon dates: A.D. 1164 (M-1863) and A.D. 1304 (M-1864). Another date of A.D. 1422 $\pm$ 100 (Michigan State University Museum site files) on Traverse wares is available from the Henderson-Lamb site on the Intermediate River to the north of the Skegemog Point site. Additionally, Lovis (1990a:37-50) has reported an accelerator date of A.D. 1162 $\pm$ 85 on a Traverse ware vessel from the Fletcher site in the Saginaw valley. These dates place Traverse ware in a contemporaneous position with Juntunen ware to the north and Moccasin Bluff (Betteral and Smith 1973) and Dumaw Creek wares (Quimby 1966) to the south. A fair number of radiocarbon dates have been reported for late period ceramics. Pertinent dates are summarized in Table 8.

Although none of the vessels employed in this analysis occurred in direct association with the two Traverse phase dates from Skegemog Point, there is a degree of concentration of certain types within the vicinity of the features producing the dates. The earlier of the two Traverse phase dates from Skegemog Point is derived from the central portion of Area 3. This Area contains the bulk of the Traverse Scalloped and Traverse Pinched vessels, suggesting that they appear no later than the twelfth century A.D. The longevity of these types, however, is not clear, particularly the Traverse Pinched variety. The later of the two Traverse phase dates, derived from Area 2, does not particularly help clarify the picture. The relatively low frequency of the Traverse Pinched variety in this area of the site might suggest that its popularity is on the wane by the fourteenth century A.D. Conversely, the role of sampling error can not be ruled out. As will be seen in the regional analysis, the variety Traverse Pinched is not geographically widespread. In turn, this may provide additional circumstantial evidence for this variety being temporally restricted as well.

Traverse Scalloped, on the other hand, appears to be a much more longer-lived ceramic type. Sites such as 20GR91 and Dumaw Creek with their fifteenth century radiocarbon dates (Table 8) both have produced samples of ceramics similar to Traverse Scalloped. Evolutionary changes within Traverse Scalloped, or any of the other varieties of Traverse ware, can not be ruled out.

Other hints at stylistic change within late phase ceramics in northern and western Michigan is provided by two studies (Garland 1989; McHale-Milner and O'Shea 1990). Given the strength of stylistic similarity between Traverse ware and ceramics to the south of the Grand Traverse Bay region, the work carried out by Garland may be more applicable. Working with ceramics from the Elam, Allegan Dam, and Schwerdt sites in the Kalamazoo River Valley, Garland (1989) has proposed the following stylistic trends for the late part of the Late Woodland period. Ceramic vessels with short, sharply everted rims, largely undecorated surfaces, and castellated or undulating rims appear to occur early at both the Elam and Allegan Dam sites. The latter site is dated to the period between the late 1200's and the fourteenth century A.D. (Spero 1979). These types do not occur at the Schwerdt site which is radiocarbon dated to the early part of the fifteenth century A.D. (McAllister 1980). Finally, grit tempered, scalloped lip vessels are dated as late as A.D. 1450 at the Elam site (Garland 1989). This further suggests that the similar Traverse Scalloped type may be equally as long lived.

Before turning to those varieties of Traverse ware which exhibit more complex decorative styles, a very interesting, albeit anomalous, situation with ceramics from northern Michigan needs to be mentioned. In a recent summary of the Ottawa (McClurken 1986), a photograph of an Ottawa family from the Burt Lake area dating around 1860 is used to illustrate a traditional domicile. In the center of the foreground of this picture is what appears to be a ceramic vessel. Although the lip of the vessel is out of focus, it does exhibit the rounded to gently rounded, slightly elongated body,

moderately constricted neck and sharply everted rim so characteristic of Traverse ware. From what can be discerned of the lip, it almost appears to be scalloped. One explanation is that this photograph provides evidence of continued manufacture of Traverse-like ceramics into the Historic period. Although it is possible that the vessel represents a curated family artifact or was obtained from an archaeological site, the fragile nature of terra cotta vessels and the apparent context in the picture suggests that it is a functioning item of material culture. Unfortunately, no other information is available for this photograph, it will most likely remain an interesting anomaly.

A minority of the Traverse wares show some stylistic similarity with Younge tradition ceramics in southeastern Michigan (Cleland n.d.a.). Vague or loose similarities are also considered to exist with the Juntunen phase ceramics to the north.

Specifically, these include the variety Traverse Complex Decorated. It must be emphasized that this group of ceramics accounts for less than 4% of the total number of Traverse ware vessels identified at Skegemog Point. Obviously, reliance on this type to help elucidate temporal trends in Traverse ware is questionable. Recent work carried out by personnel at the University of Michigan has suggested some stylistic trends within Juntunen phase ceramics (McHale-Milner and O'Shea 1990), which may be helpful in understanding general stylistic trends in the Upper Great Lakes region. Although McHale-Milner and O'Shea (1990) imply that these trends are specific to Juntunen ware, Cleland (personal communication 1990) indicates that these trends are very regional in character and not limited to Juntunen ware. Whether Cleland's or McHale-Milner and O'Shea's contentions are correct can not be addressed here. What is important is that the work conducted by McHale-Milner and O'Shea (1990) represents the first systematic attempt to chart these stylistic trends. They are considered here in only a generalized fashion along the lines suggested by Cleland.

Briefly, these changes involve an increase in the frequency of cord impressed and incised designs relative to the occurrence of drag-jab designs. An increase in the

use of unusual and asymmetric design layouts is also seen, although these always remain relatively rare variants. There is also some suggestion that there is a decrease in the placement of decoration on the lip and shoulder of the vessel through time. Although these evolutionary changes appear to occur relatively slowly over the course of the Juntunen phase, McHale-Milner and O'Shea (1990: 7) place this transition during the fourteenth to early fifteenth century A.D. If this is indeed the case, then it may be postulated that Traverse Complex Decorated Punctated variety occurs in the earlier portion of the Traverse phase, while the Non-Punctated variety occurs sometime around or after the beginning of the fifteenth century A.D.

DISCUSSION AND CONCLUSIONS

The stylistic composition of the ceramic wares from the Skegemog Point site shows some clear trends through time both between and within the three wares. The distance between the breaks in the various levels of the cluster dendrograms and the key variables provides information about the hierarchy of stylistic attributes in these ceramic sets. The ensuing discussion takes place primarily in reference to the dendrograms for the three ceramic wares illustrated in Figures 9, 10 (Bowerman ware), 14, 15 (Skegemog ware), 27, and 28 (Traverse ware).

Broadly, all three of the ceramic wares initially divide on the presence or absence of exterior decoration. The next level of division within the individual wares keys in on either morphological and/or aspects of decoration. Within the undecorated varieties emphasis is placed on morphological characteristics and the presence or absence of lip decoration. In the decorated types the internal divisions also key out on the condition of the lip decoration (present/absent), as well as on the general location and type of exterior decoration and its complexity. Examination of the dendrograms shows a loose association between the different hierarchical levels of cluster agglomeration and the overall visibility of the morphological and decorative attributes

(cf. Carr 1985a, 1985b; Carr and Rosenthal 1986). For example, with only a limited range of vessel forms available for each of the ceramic wares, the most visually striking differences occur in terms of the presence or the absence of decoration on the vessel exterior. Admittedly, one would intuitively expect that certain features of vessel morphology such as the degree of rim eversion would also key out at a relatively high level in the dendrograms. While this does happen to a certain degree across the different wares, it is not consistent. This suggests that the structure of the decoration or lack thereof is a more important criteria in terms of viewing ceramic stylistics as a measure of social interaction and social group messaging. It should also be made clear at this juncture that due to the highly fragmented nature of the ceramics, a lot of information about certain key aspects of vessel morphology such as the shoulder shape were not systematically available. Further investigation along these lines will be necessary in order to confirm the role of the shape of the sub-rim portions of the vessels in the hierarchy of visibility.

At moderate or middle levels of the visibility hierarchy are more fine-grained aspects of the overall decoration and vessel form. Specifically, this includes attributes such as the presence/absence of lip decoration and the occurrence of collaring on the vessel. At the lowest level of the visibility hierarchy are decoration specifics which would appear to fall into the category of Voss's (1982) "nuances of style" or "potter's choice". This includes aspects such as the orientation of the decorative elements, the tool chosen to execute the individual decorative elements, and the direction of application of the tool relative to the ceramic surface. With these general observations laid out, it is worthwhile to take a little closer look at the stylistic structure of each of the ceramic wares.

Overall, Bowerman ware exhibits the lowest levels of morphological and decorative variation of the three ceramic wares. That is, this ware contains the most restricted range of decorative and morphological attributes considered in this study.

Despite the relatively narrow range of attribute states present in this sample, the distances represented within the individual clusters are relatively large before the individual vessels agglomerate into meaningfully interpretable groups which have typological significance. The internal structure of the clusters, however, is relatively clean in terms of the variability represented within any given group of attribute states, particularly the morphological attributes and the composition of the lip decoration. Within the decorated varieties of Bowerman ware, the highest amounts of variability occur within those attributes identified above as most likely to be a product of "potter's choice". Although the two varieties of decorated Bowerman ware have been differentiated on the presence or absence of lip decoration, beyond this distinction they are very similar in terms of the exterior field chosen for decoration.

However, the position of the individual elements within the decorative field does exhibit systematic variation, suggesting that it, in part, influences the decision whether or not to decorate the lip of the vessel. The number of bands of decoration applied to the vessel exterior also appears to have a role in this part of the decision making process. The implication is that there is more structure to the decorative stylistics of some of the early Late Woodland wares than has been assumed in the past, at least with the more southern- derived or southern-influenced ceramic types. Whether or not this situation holds for the other early Late Woodland ware at the McClurken Point site will be explored below.

In comparison to Bowerman ware, the dendrograms for Skegemog ware exhibit an equal number of stages of clustering before arriving at interpretable clusters. However, the distances involved in these lower order levels are much more attenuated than in Bowerman ware. This would suggest that within the clusters, at least in the lower levels of the undecorated varieties, there is greater between-vessel similarity than seen in Bowerman Plain. The break between the sub-varieties of Bowerman ware also occur at relatively low levels within the dendrogram indicating that the differences

between collared and uncollared forms of variety Undecorated Lip and variety Decorated Lip are fairly low. However, the break between the two varieties of Skegemog Undecorated occurs at only a slightly lower order than with the three varieties of Bowerman Plain. Again, this is seen as indicating that the overall difference between these two varieties is not great.

A different situation is seen with the type Skegemog Decorated. Again, within each of the four main clusters differentiated at the variety level of this classification, the overall amount of difference seen is relatively small. There is however, a greater degree of variability in the actual distances at which the member vessels join with each other to form the main clusters (i.e., varieties). This is interpreted to mean that there is a fair amount of variability in the specific configuration of any given vessel within each of the clusters. That is, there is a greater degree of within cluster variability than seen with the other early Late Woodland ware represented at the Skegemog Point site.

Examination of the distance between the main varieties also tends to support this interpretation. A very interesting situation is seen with the cluster termed Skegemog Decorated, variety Decorated Rim Interior and Lip. From the examination of the dendrogram (Figure 16) in comparison to the other main clusters, it would appear that the extreme left hand side of the cluster would be a separate viable cluster from the other segments of this portion of the dendrogram. However, in the examination of the attribute frequencies for the lower orders of this group of sub-clusters, it was not possible to see any clear interpretable viable distinctions between them. Hence, the reasoning behind describing the variety Decorated Rim Interior and Lip as being composed of two weakly expressed sub-varieties is explained. These differences are based on the occurrence of splayed lips, a greater degree of lip eversion, curved rim shapes, a greater degree of rim eversion and a lesser degree of rim interior decoration in one group and not the other. This raises some question about the strength of the association between rim eversion and the occurrence of rim interior decoration as a key

discriminating attribute in Skegemog ware, in particular, and in other early Late Woodland ceramic wares, in general.

The distance between the joining of all of the Skegemog Decorated varieties is relatively small with the exception of the variety Impressed Collar. This latter variety does not join the cluster with the other varieties until a much higher level of the dendrogram. This phenomenon is apparently primarily the result of the exterior decorative field chosen for placement of the decorative design, that is the collar versus the neck. Further differences are also seen in terms of where the decoration is actually positioned within the decorative field. In the former case, it tends to be at or near the top of the field, while in the latter case it is strongly associated with the center or the bottom of the decorative field. Visually, these two aspects create very different effects on the vessels, ones which may be assumed to have a fairly high degree of visibility even from some distance. Internally, the other three varieties, Decorated Rim Interior and Lip, Undecorated Lip, and Decorated Lip and Exterior, show a fair degree of similarity in the distribution of the attribute state frequencies of exterior decoration. This would suggest that there is a fair degree of variability in those attributes defined as primarily operating in the realm of "nuances of style", but also within more highly visible aspects of the combination of decoration within the different fields available on the ceramic vessel. That is, the decision to decorate a certain field in a certain fashion does not strongly dictate which other fields may be decorated and in what fashion. As already discussed, this does not, however, hold as strongly true when the decision is made to decorate the collar of the vessel rather than the neck of the vessel. So while there does appear to be a loosening of the decorative rules, some structure does remain in the decorative behaviors.

A different situation appears to evolve with the advent of the Traverse wares sometime in the late eleventh or twelfth century A.D. Once again, there appears to be a shift back towards relatively 'tighter' rules of behavior governing the creation of the

decorative styles seen in Traverse ware. In Traverse Plain, a fairly large break is seen between the two constituent types. In the first variety, Scalloped, the internal distances among the sub-clusters are all relatively small. Given the fact that the visual difference between a scalloped lip and an unscalloped lip is (intuitively) fairly great, it is somewhat surprising that a clearer separation of these two lip forms did not occur.

There are several possible explanations for the above phenomenon. One is that the decision to scallop or not scallop the vessel lip falls in the realm of "potter's choice". Frankly, this option does not make a lot of intuitive sense. Another explanation is that this cluster contains a degree of temporal variability. Given the above discussion concerning the dating of the Traverse wares, this is the explanation favored here. It is presumed that the Scalloped Lip variety of Traverse ware is added to the inventory of undecorated forms rather than totally replacing the unscalloped lip form.

A similar phenomenon is seen with the second variety of Traverse Plain in the occurrence of peaked lips on the vessels. Again, the visual difference between a peaked and an un-peaked lip form is visually dramatic. However, the majority of the vessels exhibiting peaked lips clustered at a relatively low level and short distance with the other sub-clusters forming the right hand portion of the Decorated Lip cluster (Figure 28). The sub-clusters to the left of this appear to key out on the basis of lip profile, a much lower visibility attribute state than peaking of the lip. Since there does appear to be a relatively high occurrence of peaked lips with the Pinched variety of decorated Traverse wares and given the above contention that Traverse Decorated, variety Pinched is both temporally and geographically restricted, the addition of undecorated vessels with peaked lips in this main cluster may reflect a degree of temporal change within Traverse ware.

Similar types and distances between the agglomeration of clusters seen in Traverse Plain is also seen in the varieties of Traverse Decorated. Within the varieties

Punctate and Complex Decorated, the distances between the sub-varieties composing these varieties show some degree of similarity. Important differences are also present. Interestingly, the Undecorated Lip sub-variety and the Decorated Neck sub-variety (which has decorated lips) agglomerate before the inclusion of the Decorated Lip sub-variety. This appears to be the result of the controlling factor of the general placement of the decoration on the exterior of the vessel. Again, this is viewed as further indication of a relative tightening of the rules of behavior governing the execution of the overall decorative designs on Traverse ware.

Within the variety Complex Decorated, there is little distance between the groups which cluster to form the sub-varieties of this variety. The distance between the agglomeration of these two sub-groups into a single cluster, however, is much greater. If the previously discussed temporal changes advocated by McHale-Milner and O'Shea (1990) for the Juntunen phase hold, even loosely, for the more complex decorative styles on Traverse ware, then it would lend credence to the ability of the cluster analysis to discern some degree of temporal variability within Traverse ware.

The final agglomeration of the decorated Traverse wares occurs with the joining of the Traverse Pinched variety. The distance between the group formed by varieties Punctate and Complex Decorated and that formed by the Pinched variety is among the greatest seen among any of the decorated ceramic types at the Skegemog Point site. This serves to further demonstrate the extremely visual uniqueness of the Pinched variety of Traverse ware. As such, it is not surprising that Traverse Pinched has come to characterize the unique nature of Traverse ware ever since Cleland (n.d.a.) first described the ceramic assemblage from the Skegemog Point site

In sum, through time across the three ceramic wares at the Skegemog Point site, changes in the structure of the behaviors involved in the decoration of the ceramic have been mapped out and discussed. A shift from a somewhat structured, if variable, set of behavior in the decoration of Bowerman ware to a much looser, more highly variable

design layout structure for Skegemog ware is seen. An alternate explanation for this situation is that it is a product of an increase in the number of people producing Skegemog ware. This is followed by an increase in the behavioral constraints on the choices made in the build up of the overall vessel decoration on the Traverse wares.

Given the theoretical orientation of this study, these changes are seen primarily as the product of shifts in the structure of intergroup relationships and their intensity through time. Changes in the structure of the basic co-resident social group and the structure of their aggregations may also affect the degree to which ceramic vessels may be viewed as a means by which to gauge questions of social boundary maintenance and interaction patterns. That is, through time is the context of use of ceramic vessels similar enough that this is not a major factor in the suitability of this particular class of material culture to function as a conveyer of information about social group affiliation and the intensity of interaction between different social or identity conscious social groups. It is to this question that attention is now turned with the consideration of the spatial dynamics of the Skegemog Point site.

CHAPTER 4

SPATIAL ANALYSIS OF THE SKEGEMOG POINT SITE

INTRODUCTION

This chapter summarizes and assesses the structure of the spatial patterning of the primary artifact classes and physical features of the Skegemog Point site. This is done to gain a better understanding of the nature of the occupation at the site through time. The examination of the correlation of the various artifact classes at the site provides information relevant to reconstructing the structure of the various social groups which used the site. This, in turn, provides important information about what factors may impinge on the nature and structure of the stylistic behavior represented in the ceramic assemblage from the site. As discussed by Voss and Young (1989) and others (Carr 1985a, 1985b; Carr and Rosenthal 1986) an understanding of the social context of use of a particular artifact type is crucial to understanding its role as a signaler of social group affiliation or the process of social interaction. This necessarily includes information regarding the general structure of the social systems using those artifacts.

A central question of this analysis is the place of the Skegemog Point site in the annual settlement round and the nature of the social groups occupying the site. It has been postulated by Cleland (n.d.a.) that Skegemog Point is a village whose primary time of occupation is the warm season. The "technic ecotype" group proposed by Fitting and Cleland (1969) for the transition zone environment, the Ottawa pattern, serves as a model for this site. According to this model, it is expected that the warm season is the time of maximal social group aggregation and least amount of residential

mobility. In keeping with the proposition articulated by Stevenson (1987) and discussed in Chapter 2, it is at these times of social aggregation that the greatest emphasis on signaling membership in a particular identity conscious social group through stylistic behavior would occur. Thus, the fullest range of stylistic variability in its most constrained form should be expressed at a site such as Skegemog Point. This chapter will provide additional data to test the hypothesis that Skegemog Point was a warm season residential locale occupied by fluid, egalitarian based social groups.

The analysis of the spatial dynamics at the Skegemog Point site takes place in two parts. First, the results of the lithic classification presented in Appendix 2 are summarized and assessed. This will provide information about the structure of the techno-economic organization of the cultures producing Bowerman, Skegemog, and Traverse wares. It also serves as an indication of the nature and breadth of activities carried out at the site as reflected by the lithic industry. The general structure of the flint knapping activities and reduction strategies employed at the site are examined within the context of other analyzed lithic assemblages from the area (primarily Binford and Papworth 1963; Lovis 1973; McPherron 1967). Particular attention is directed towards evaluating the relative frequencies of the various debitage classes as they relate to the reduction sequence from unaltered pieces of raw material to finished and, ultimately, discarded tools. The general structure of the various tool classes is also be examined for instances of co-occurrence or co-variation across the site. This procedure allows the identification of groups of stone tools which are consistently associated with one another. Such associations may be interpreted as "tool kits" or otherwise viewed as indicators of loci of functionally specific and/or associated activities.

The second part of this analysis incorporates the ceramic assemblage into the spatial analysis as a means of adding temporal control. It also adds a very important indicator of the occurrence of the quintessential domestic activity: food preparation and cooking. Since food preparation was largely conducted by women in Upper Great

Lakes societies (Driver 1969; Kinietz 1940), this aspect also adds another dimension to intra-household economic cooperation. Although definitive evidence is lacking for the prehistoric period of the Upper Great Lakes area, it can be presumed that ceramic manufacture was also primarily a female task. When ceramic manufacture has been observed ethnographically in the northeastern United States, this was the case (Arnold 1985).

METHODS

To examine the above hypotheses, the raw tool and debitage frequencies along with sherd weights and vessel counts were plotted on base maps. This produced a distribution which appeared to consist of a massive lithic and ceramic smear across the landscape. As noted above, the lithic assemblage was first examined without the inclusion of the ceramic data. Since few lithic tool forms are temporally associated with specific subdivisions of the Late Woodland period, this portion of the analysis applies to the Late Woodland occupation of the site as a whole. However, the analysis does follow the spatial subdivisions of the excavations defined in Appendix 1 and chronological control therefore is associated with a certain amount of horizontal separation of the archaeological occupations.

The density of debitage and residual ceramic sherd weights across the excavation areas forms the basis data for this analysis. Densities are assumed to indicate the intensity of specific lithic and ceramic activities across the site, as well as indicating occupational intensity. Lithic density is measured in terms of counts per cubic footage of excavation, while ceramic density employs gram weight per cubic footage. The calculation of the estimated residual sherd weights for the site has been discussed in Chapter 3. Calculation of the cubic footage of excavation for each unit used only levels producing artifacts since sterile levels are consistently the last excavation level in any given unit.

The search for structural patterning in each of the lithic and ceramic types considered was conducted in two ways. First, 2X2 contingency table analysis was performed. Second common factor analysis was applied to the data set. Several factors predicated the use of factor analysis on this data set. Foremost, overlapping activity sets from the different occupations of the site are expected. Using both experimental data and a case study from the Paleolithic, Vierra and Taylor (1977) have demonstrated the utility of this analytic procedure for identifying overlapping clusters of artifacts. Schiffer (1975) also conducted experimental work with factor analysis which demonstrated its utility in isolating "tool kits". Also, the size of the basic excavation unit, a 10 foot square, does not allow for the employment of a fine grain level of provenience. Third, in a recent re-analysis of the spatial dynamics of the O'Neil site, Lovis (1990b) has demonstrated the utility of this technique in this region.

In both the 2X2 contingency table analysis and the factor analysis only the three largest excavation blocks could be analyzed due to the small sample size of the remaining areas. The artifact sets from the other excavation areas are, however, compared with the statistically analyzed areas. Units of measurement employed consist of raw frequency counts per excavation unit for the stone tools and ceramic vessels. Because of the large values of the debitage counts and the residual ceramic sherd weights, these values had to be ordinally scaled so that the range of scalar variation was not too great. Furthermore, for each of the statistical analyses four sets of data were employed; one for each of the largest excavation blocks and one utilizing the total assemblage from the site. Significance levels of $\alpha=.05$ and $\alpha=.01$ were examined for evaluating the calculated chi-square statistics. In three of the four data matrices it was necessary to employ the Yates correction for continuity (Blalock 1972:285-286; Kolstoe 1973: 239) to compensate for low degrees of freedom (i.e., $df=1$).

In the fourth data matrix, Area 2, it was necessary to utilize Fisher's exact test as the test for association (Blalock 1972:287; Kolstoe 1973:243). This formula provides exact rather than approximate probabilities by viewing the sample as an actual population from which repeated samples are drawn (Blalock 1972:287). As with the continuity correction, the net effect is the generation of a value which is on the conservative side for rejecting the null hypothesis that there is no association between variables.

Both tests indicate whether the association between two variables is statistically significant or the product of random processes. They indicate nothing about the strength of the relationship. To assess the strength of the relationship between two variables in this situation, the phi coefficient is viewed as appropriate for 2X2 table analysis. The phi coefficient corrects for the fact that the chi-square value is proportional to the sample size by adjusting the value of chi-square (Nie et al. 1975:224). The value of phi ranges between 0 for no relationship to +1 when the variables are perfectly related. As discussed below the results of this portion of the analysis are not viewed with satisfaction.

In an attempt to isolate functionally specific activities present in the spatial distribution of the artifact classes, the same four data matrices were then subjected to factor analytic procedures. The reasons for choosing this analytic technique is outlined above.

Initial preparation of the data matrices prior to statistical manipulation was aimed at removing those variables which would not contribute to the solutions in a meaningful fashion. Culling and combining variables into a usable matrix for each data set was accomplished in several ways. First, as with the chi-square analysis, all artifacts which could be assigned to occupations preceding the Late Woodland period were removed. These consist primarily of 20 projectile points and 11 formal bifaces. In

the case of ceramics, those vessels classified as foreign in origin were also deleted. This was required by the small number of such vessels in the assemblage.

Second, by examining the descriptive statistics (mean, standard deviation, range, etc.) it was possible to immediately remove several other variables and to combine others into a single variable. Included in this group are abraders, celts, ground stone ornaments, unidentified ground stone tool fragments, and miscellaneous coarse stone tools. Denticulates, notches, perforators, and gravers were combined into a single variable labeled unifaces. Furthermore, utilized flakes were removed from the examination of the three excavation blocks because of ambiguity in their origin. They are also highly redundant with the intentionally retouched flake category.

After redundant or otherwise unuseful data was removed, two separate correlation matrices were examined for each of the data sets. The first utilized all recorded variables, while the second uses the modified variable list. The first matrix served to verify that the variables initially identified for removal were indeed noise in the matrix. The second correlation matrix was then used to examine the intercorrelations among the remaining variables and to further identify any variable(s) which would not contribute significantly to the factor solutions. In the case of Area 2, it was also necessary to combine several variables and to delete drills so that the number of variables did not exceed the number of cases. Failure to do so would have resulted in a correlation matrix in which some of the scoring coefficients are zero.

To maximize the number of variables which could be used in this stage of the analysis, the internal subdivisions of the primary tool classes were not employed. This reduced the potential error resulting from the use of very different variable lists among the data sets.

During the execution of the factor analysis, both unrotated and VARIMAX rotated factor solutions were analyzed. The latter version proved to be the most amenable to interpretation and spatial plotting. Varimax rotation is suited to R-mode

analysis (i.e., variable based) and is a form of orthogonal rotation which serves to simplify the structure of the columns (i.e., the extracted factors) by maximizing the variance of the squared loadings of each factor (Nie et al. 1975:485). In keeping with standard statistical practices, only those factors with eigenvalues equal to or greater than one are examined.

After the significant factors were extracted and their constituent variables were examined, they were plotted spatially. Initially, the variables comprising the factors were plotted on a simple presence/absence basis across the excavation grids. This created a morass of overlapping and uninterpretable spatial patterns. To alleviate this situation, the inclusion of any given variable in a plotted factor is based upon two criteria. First, only those grid units which exhibit variable frequencies approaching or exceeding one standard deviation of the variable's mean are included. This is viewed as a means to further remove noise in the data sets and to further focus on the underlying structure of the assemblage and its spatial distribution. Thus, the mapped occurrence of a factor represents the area of its clearest or most intense expression.

Secondly, only grid units containing two or more of the defining variables of a factor are included, except in those cases where a single variable defines a factor. The completeness of the expression of the factors is also taken into consideration when examining the spatial structure of the factors in each of the excavation blocks.

DISCUSSION OF THE LITHIC TECHNOLOGY

This section summarizes and assesses the structure of the lithic assemblage from the Skegemog Point site in terms of the trajectory of reduction activities taking place at the site. The nature and breadth of economic activities represented by the stone tools is also explored.

A common approach to lithic analyses in western and northern Michigan is the calculation of the ratio of tools to debitage. This is interpreted as a general indicator of

the relative importance of flint knapping in comparison to other activities involving chipped stone tools. Comparison of the tool to debitage ratio at the Skegemog Point site with the ratios summarized by Lovis (1973:157-158) for the O'Neil, Eastport, Juntunen and Spring Creek sites demonstrates some major differences.

The occupations of the O'Neil and Eastport sites are heavily directed towards flint processing. This is the primary activity carried out at these sites (Binford and Papworth 1963, Lovis 1973). Given their proximity to the Pi-wang-go-ning Quarry site this is not unexpected. These two sites have very high debitage to tool ratios of 171:1 and 95:1, respectively. At the opposite end of this spectrum is the Spring Creek site, which has been interpreted as a residential locale. It exhibits a very low debitage to tool ratio of 6:1 (Fitting 1968a:32). Lying between these two extremes is the Skegemog Point site with a ratio of 22:1. This figure is very close to that of 26:1 calculated for the Juntunen site (Lovis 1973:158), a residential fishing locale (McPherron 1967).

The difference between the Skegemog Point and O'Neil sites in the lithic production system is even more evident when the ratio of cores to artifacts is examined. At O'Neil it is 1:1 (Lovis 1973:157), but at Skegemog Point it drops off to 0.2 cores per tool. While it does appear that initial flint processing activities are important at the Skegemog Point site, it is certainly not the dominating activity that it is at the O'Neil site. It may best be viewed as a moderately intense activity.

Two methods of working cores have been identified for the Late Woodland period in the Upper Great Lakes area: free-hand (Crabtree 1972) and bipolar (Binford and Quimby 1963; Flenniken 1980) techniques. The first is self-evident: simply holding the core or preform in one hand and delivering a blow with a percussor in the other. The second, however, is more ambiguous and the subject of some confusion in the literature. Most researchers agree that the bipolar technique requires the placement of a piece of raw material on an anvil and removing flakes by direct percussion.

Several authors (Binford and Papworth 1963; Binford and Quimby 1963; Fitting 1968b:116-133), however, have implied that the direction(s) of flake removal is also a distinguishing characteristic. When flake removal occurs from opposing ends of the cores they are referred to as bipolar and when it occurs from only one end they are referred to as unipolar cores.

In this study the term bipolar is applied to any core which is worked by placing the specimen on an anvil and removing flakes by direct percussion. Whether flakes are removed from one end or both is not considered to be a diagnostic characteristic of the bipolar technique. Instead, emphasis is placed on the presence of small hinge and step fractures and/or stress cracks resulting from end shock and rebound damage as a distinguishing characteristic. Multi-directional flake removal patterns are simply a means of extending the life of the core and increasing the number of usable flakes which could be generated.

A point concerning the role of the two reduction techniques needs to be made clear. Free-hand and bipolar techniques are often viewed as mutually exclusive or sequential techniques of working cores, the choice of which is a function of raw material size. Free-hand percussion is the method associated with the reduction of relatively large pieces of raw material, whereas bipolar percussion is viewed as the means allowing the exploitation of small pebble cherts. While this is largely true, the cores from the Skegemog Point site suggest several other advantageous aspects to the bipolar technique. Not only is it an excellent means for the initial decortication and/or splitting relatively large cobbles or blocks of chert, but it is also another means of consistently removing linear and slightly expanding flakes preferred for tool blanks. Thus, while bipolar percussion is highly correlated with the exploitation of small sized pieces of raw material, its use may also occur at any stage of reduction. The bipolar technique may also be freely intermixed and used in combination with the free-hand technique. That is, these techniques are interchangeable and highly compatible. Size is

a factor, but only one factor, in determining which technique is employed and at what stage of reduction it occurs.

With this in mind, a brief review of the core reduction sequence developed by Lovis (1973:157-162) for the O'Neil site is useful for understanding strategies of core reduction at the Skegemog Point site. Lovis' (1973) paradigmatic classification makes an initial separation of the raw material by size. Small pebbles are reduced exclusively by bipolar percussion until they are exhausted or otherwise unfit for further flake removal. The larger cobbles and blocks of Norwood chert offer more options in terms of their reduction. The primary option is to remove flakes by either direct percussion or indirect percussion. As noted above, the block cores from the Skegemog Point site indicate that the bipolar removal of flakes from these cores also occurs. Initial preparation of the block cores is accomplished either by splitting the block in half or removing the cortex from one lateral face. According to Lovis (1973: 159-160), other options are only exercised if the core breaks during reduction. In the case of catastrophic hinge-outs or hinge-throughs, the core can be rehabilitated either as a bipolar core or a planoconvex core; whereas, if the failure is longitudinal the options shift to planoconvex and biconvex core forms. Amorphous core forms are also closely related to this latter trajectory. Even at sites near the main quarry, maximal, if not efficient, usage of the cores is built into the reduction strategy.

At the Skegemog Point site, the relative frequencies of the recovered core types indicate two general aspects of the reductive sequence. First, core forms largely indicative of the middle and latter stages of the core reduction process predominate. Unaltered blocks of chert are particularly rare and, although block cores comprise nearly one-third of the cores, a majority of them are extensively worked. The relatively large number of heavily worked bipolar cores further verifies this. It also indicates that the exploitation of small pebble cherts available in the immediate site area is also common, further emphasizing the highly localized nature of the lithic industry.

Evaluation of the relative frequencies of the various flake classes further demonstrates that it is predominantly the middle and latter stages of lithic reduction being carried out at the Skegemog Point site. The frequency of each flake class for the site and each of its major subdivisions is presented in Table 9. A plot of their cumulative frequencies is presented in Figures 47 and 48. For summary purposes, the debitage classes are discussed in terms of their relative stages of reduction (early, middle, late). Classification of the debitage is detailed in Appendix 2.

Although the amounts of debitage recovered from specific excavation areas at the site vary widely according to the amount of area excavated, the relative frequencies within each debitage class do not vary appreciably (Figures 47 and 48). At this juncture, it is difficult to identify any discrete areas where the different stages of reduction and tool manufacture may have taken place. It does not, however, prevent identification of the general nature of reduction at the site. Further, it suggests that the knapping processes conducted at the site throughout the duration of the Late Woodland period may not vary significantly.

The initial stages of lithic reduction represented by shatter, blocky decortication and flat decortication flakes with simple striking platforms occur in relatively low frequencies. Overall, they comprise only slightly more than 17% of the classified debitage at the site. The only major departure from this is Area 3 in which the early stages of reduction account for slightly less than 30% of the debris. Incidentally, Area 3 also happens to contain some of the purest Traverse phase components excavated at the site. This may be an indication that significantly higher amounts of unaltered or minimally altered chert cobbles were being brought to the site during this phase of the occupation.

Beyond the early stages of reduction, the slope of the cumulative frequency curves becomes fairly steep (Figures 48 and 49), indicating appreciable amounts of

Table 9. Debitage Class Frequencies at the Skegemog Point Site

Excavation Area	Flake Class Shatter	BD	FSD	FCD	BS	FSS	FCS	FSF	TOTAL
1	482	595	522	16	1627	1466	1267	1285	7260
1A	6.6	8.2	7.2	0.2	22.4	20.2	17.5	17.7	100
	40	85	77	2	301	284	435	601	1825
1B	2.2	4.7	4.2	0.1	16.5	15.6	23.8	32.9	100
	52	54	49	0	316	379	292	429	1571
2	3.3	3.4	3.1	0	20.1	24.1	18.6	27.3	99.9
	188	223	241	17	983	1119	1307	1948	6026 ²²⁷
2A	3.1	3.7	4	0.3	16.3	18.6	21.7	32.3	100
	17	24	33	1	37	65	38	56	271
3	6.3	8.8	12.2	0.4	13.6	24	14	20.7	100
	339	258	180	4	670	518	356	337	2662
4A	12.7	9.7	6.8	0.1	25.2	19.5	13.4	12.7	100
	26	70	57	2	305	333	339	341	1473
4B	1.8	4.7	3.9	0.1	20.7	22.6	23	23.1	99.9
	90	91	82	0	386	392	240	291	1572
5A	5.7	5.8	5.2	0	24.6	24.9	15.3	18.5	100
	5	5	2	1	13	16	15	12	69
5B	7.2	7.2	2.9	1.4	18.8	23.2	1.7	17.4	99.9
	27	9	8	0	31	22	16	15	128
5C	21.1	7	6.2	0	24.2	17.2	12.5	11.7	99.9
	35	40	5	0	71	105	72	102	460
	7.6	8.7	7.6	0	15.4	22.8	15.6	22.2	99.9

Table 9 (cont'd).

Excavation Area	Flake Class		BD	FSD	FCD	BS	FSS	FCS	FSF	TOTAL
	Shatter									
5D	26	56	2	2	3	163	159	194	241	904
	2.9	6.2	6.9	6.9	0.3	18	17.6	21.5	26.7	100
Total 5	93	110	107	107	4	278	302	297	370	1561
	6	7	6.8	6.8	0.3	17.8	19.3	19	23.7	100
Profile Tr.	7	6	10	10	0	28	15	7	16	89
	7.9	6.7	11.2	11.2	0	31.5	16.8	7.9	18	100
Other	7	10	8	8	0	33	33	53	53	197
	3.6	5.1	4.1	4.1	0	16.7	16.7	26.9	26.9	100
Total	1341	1526	366	366	46	4964	5208	631	5727	24507
	5.5	6.2	5.6	5.6	0.2	20.2	20	18.9	23.4	100

Key to Abbreviations: BD - Blocky Decortication
FSD - Flat Secondary Decortication, Simple Platform
FCD - Flat Secondary Decortication, Complex Platform
BS - Blocky Secondary
FSS - Flat Secondary, Simple Platform
FCS - Flat Secondary, Complex Platform
FSF - Flat Secondary Fragment

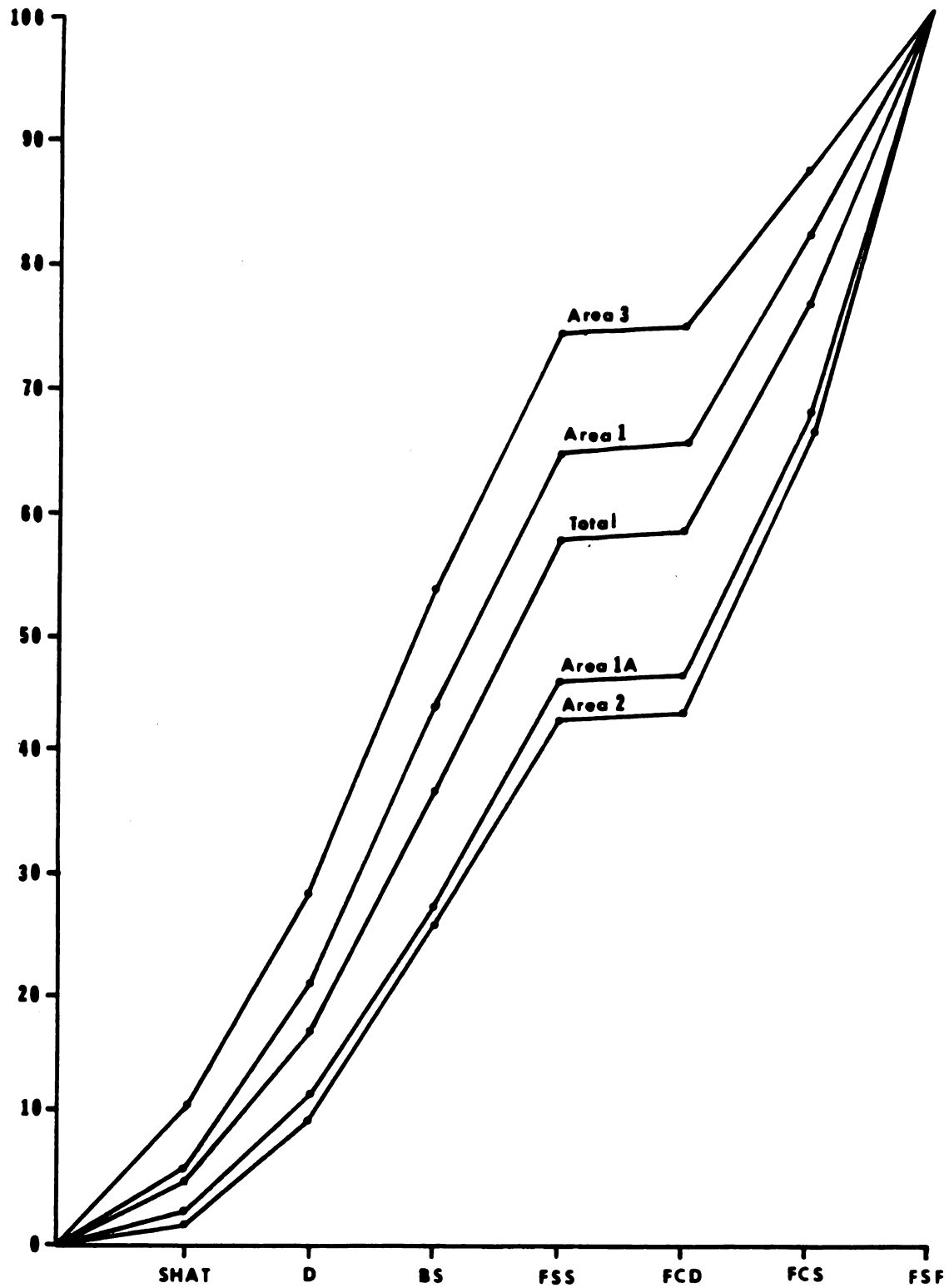


Figure 48. Cumulative Frequencies of Flake Types, Part 1

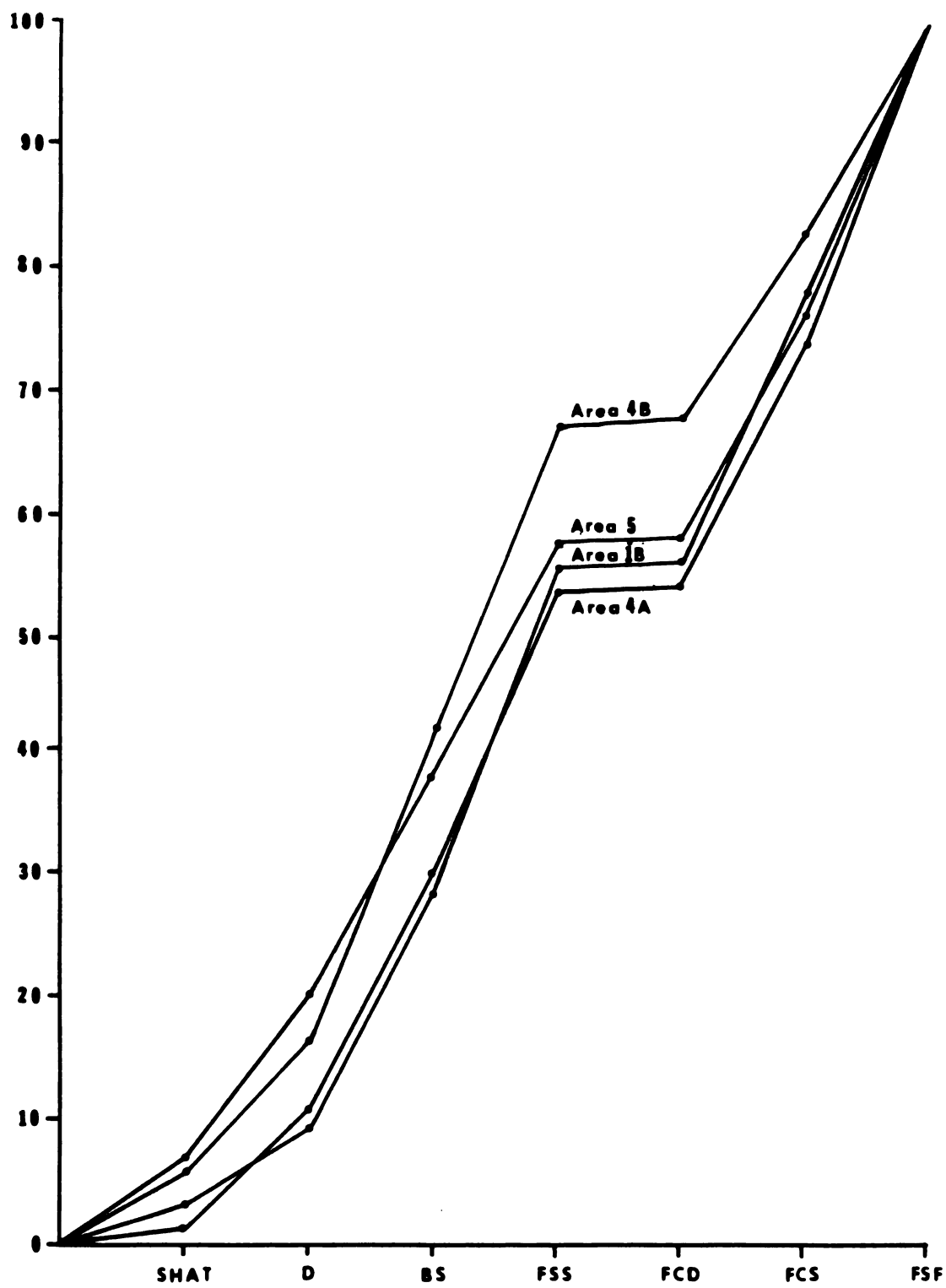


Figure 49. Cumulative Frequencies of Flake Types, Part 2

debitage comprising this end of the reductive sequence. The sole plateau occurs with the addition of the flat decortication flakes with complex striking platforms. This is simply a result of the fact that they are a rare flake type. Together, blocky secondary and flat secondary flakes with simple striking platforms represent approximately 40% of the recovereddebitage. Flat secondary flakes with complex striking platforms occur in a very slightly lower frequency of just under 19%. This portion of the cumulative frequency graph is interpreted as indicating that the manufacture of usable flake blanks and their reduction into generalized tool forms is a primary focus of the flint knapping activities at the Skegemog Point site. Final bifacial shaping and transforming the generalized forms into specific tool types also occurred and may be spatially localized. Although barely perceptible, there is a slightly higher frequency of bifacial thinning flakes in Areas 1A and 2. This may indicate a slightly higher occurrence of final thinning and tool repair and rehabilitation in these areas of the site. The differences, however, are so minor that they may well be the result of sampling error.

In addition to the large amounts ofdebitage recovered from the site, a number of tools associated with chipped stone tool manufacture are also represented in the collection. Included in this group are hammerstones and anvils.

In sum, the general structure of the reduction activities carried out at the Skegemog Point site places it towards the end of the lithic manufacturing continuum. After preparation at sites such as O'Neil and possibly the Pine River Channel site (Holman 1978), the block cores and roughed out preforms would be transported to residential locales, such as Skegemog Point and the Juntunen site. Interestingly, Lovis (1990b) has recently presented evidence to suggest that the use of the O'Neil site by the Grand Traverse Bay based populations is logistical in nature. In contrast, the occupation by Straits of Mackinac based populations is characterized as more residential in nature. This indicates shorter term trips to the Pi-wang-go-ning Quarry by the more southern groups. The relative abundance of small bipolar cores at Skegemog

Point may also indicate additional reliance on glacially transported Norwood cobbles available closer to the site.

Although the Skegemog Point and the Juntunen sites are not that far from the main source of Norwood chert, an emphasis on the initial preparation of cores near the quarry area would, in part, be required by the tendency of Norwood blocks to shatter or otherwise fail. After the tested and initially prepared cores were removed to the residential locales, full scale production of usable flake blanks and the manufacture of tools would commence and dominate the reductive process. These activities would be taking place not only to fulfill the immediate needs of the population while encamped at Skegemog Point, but also in anticipation of needs for winter hunting and other logistical activities taking place at some distance from the site. The fact that stage 1 and stage 2 bifaces comprise approximately 15% of the formal tools and 26% of the bifacial tools recovered at the site supports this contention.

The site wide densities of chert debitage and lithic tools are 3.2 flakes and 0.18 tools per cubic foot, respectively. Density figures for the excavation areas are presented in Table 10. Areas of high density are defined as those areas approaching or exceeding plus one standard deviation. Areas exceeding minus one standard deviation are considered low density areas. Areas of high debitage densities include Area 2 and 4B. Area 1 is also included in this group, since its value is very close to exceeding one standard deviation from the mean. The pattern is repeated with the tool densities, although the test pits in Area 2A replace Area 2. Tool density in Area 2 is only slightly above the mean. The reason for the high tool density in Area 2A appears to be the result of small sample size. In general, these areas are considered foci of both lithic reduction activities and general occupation. In at least one instance (Area 1), multiple occupations and reuse of specific areas within the site appear to be a factor in creating a high debitage density.

Table 10. Tool and Debitage Densities at the Skegemog Point Site

Excavation Area	Cubic Feet	Debitage	Tools
1	1820.0	4.0	0.24
1A	510.0	3.6	0.21
1B	420.0	3.7	0.16
2	1150.0	5.2	0.20
2A	90.0	3.0	0.26
3	2100.0	1.3	0.12
4A	480.0	3.1	0.12
4B	240.0	6.5	0.28
5A	120.0	1.7	0.08
5B	300.0	0.4	0.06
5C	210.0	2.2	0.13
5D	247.5	3.6	0.16
Total 5	877.5	1.8	0.11
Total	7687.5	3.2	0.18

Areas 3 and 5 are areas of very low debitage density. These two areas in addition to Area 4A, also exhibit low densities of tools. The low values present in Area 5 delimit the southern bounds of the site. Based on ceramic and structural information, Areas 3 and 4A are major foci of occupation, particularly in the former case.

The above values provide information concerning the intensity of flint knapping activities across the site, but they do not reveal much about the other types of activities represented. To summarize the functional aspects of the tool classes, three functional subsystems are employed. These categories are derived from Clark's (1984:65-73) analysis of a large lithic assemblage from Berrien County, Michigan. Included as subsystems are manufacturing, fabrication, and food procurement and processing. As defined by Clark (1984:66): "The manufacturing subsystems pertain to the production of stone tools.... "Fabrication" is used to refer to the use of stone tools in the production (and maintenance) of nonlithic items such as leather, wood, bone, antler, and shell." A miscellaneous residual category is also included. Assignment of the tool classes among these subsystems is presented in Table 11 and individual tool frequencies are listed in Table 12.

These subsets are not viewed as tool kits per se, and should not be confused as such. This system is a means to systematically and explicitly group the tools by functions. This, in turn, aids interpretation of the patterns of association and covariance among the tools elucidated through the chi-square and factor analysis. The multi-functional nature of a number of the tool types, as well as the lack of functional specificity in other instances, is indicated by the placement of some of the tool types in several different subsets (Table 11). As will be seen below, the polythetic nature of tool function and the activity sets/areas themselves is also apparent throughout the statistical analysis.

Table 11. Functional Subsets and Tool Class Assignments

Manufacturing (Stone Tools)	Fabrication (Manufacturing and maintenance of non-lithic items)	Food Procurement and Processing		
		Hunting/Butchering	Plant Processing	
Stage 1 Bifaces	Bifaces (generalized use)	Projectile points	Bifaces	
Stage 2 Bifaces	Drills (pierce hard substances)	Bifaces	Hammerstones	
Hammerstones	Perforators (pierce soft substances)	Flake knives	Anvilstones	
Anvilstones	Endscrapers (hide scraping)	Retouched flakes	Grinding Implements	
Coarse Stone Preforms	Sidescrapers (generalized scraping)	Utilized flakes	Manos	
Cores	Denticulates (sawing/cutting)		Flake knives	
	Notches (scraping/shaving)		Retouched flakes	
	Gravers (incising/cutting)		Utilized flakes	
	Pieces esquillees (splittin)			
	Flake knives (general cutting)			
	Retouched flakes (general cutting)			
	Utilized flakes (general cutting)			
	Hammerstones			
	Abrading stones			
	Celts (heavy chopping/woodworking)			
	Axes (heavy chopping)			
	Manos (hide processing)			

Table 12. Frequency Distribution of Tools by Excavation Area

Area	LWPP		S1B		S2B		LWB		DR		PE	
	Ct	%	Ct	%	Ct	%	Ct	%	Ct	%	Ct	%
1	37	8.3	16	3.6	19	4.3	42	9.4	1	0.2	46	10.3
1A	5	4.7	0	0.0	4	3.8	12	11.3	2	1.9	7	6.6
1B	13	19.1	4	5.9	3	4.4	7	10.3	0	0.0	2	2.9
2	26	11.4	6	2.6	7	3.1	31	13.6	3	1.3	12	5.3
2A	1	4.3	0	0.0	3	13.0	3	13.0	0	0.0	2	8.7
3	25	10.0	5	2.0	13	5.2	26	10.4	3	1.2	41	16.5
4A	5	8.9	2	3.6	4	7.1	13	23.2	1	1.8	0	0.0
4B	8	11.8	7	10.3	5	7.3	4	5.9	2	2.9	6	8.8
5A	2	22.2	0	0.0	1	11.1	1	11.1	0	0.0	0	0.0
5B	0	0.0	0	0.0	0	0.0	4	22.2	0	0.0	2	11.1
5C	3	11.1	0	0.0	0	0.0	3	11.1	0	0.0	4	14.8
5D	4	9.8	2	4.9	2	4.9	5	12.2	0	0.0	5	12.2
Total 5	9	9.5	2	2.1	3	3.2	13	13.7	0	0.0	11	11.6
Prof. Tr.	0	0.0	0	0.0	1	11.1	0	0.0	0	0.0	1	11.1
Surface	8	38.1	2	9.5	0	0.0	1	4.8	0	0.0	0	0.0
	137	10.0	44	3.2	62	4.5	152	11.1	12	9.0	139	9.4

Table 12 (cont'd).

Area	ESCR		SSCR		ESS		SCFRG		TSCR		DENT	
	Ct	\$	Ct	\$	Ct	\$	Ct	\$	Ct	\$	Ct	\$
1	14	3.1	13	2.9	3	0.7	5	1.1	35	7.9	7	1.6
1A	12	11.3	1	0.9	2	1.9	1	0.9	16	15.1	0	0.0
1B	1	1.5	0	0.0	2	2.9	1	1.5	4	5.9	0	0.0
2	14	6.1	7	3.1	1	0.4	4	1.7	26	11.4	4	1.7
2A	0	0.0	1	4.3	0	0.0	0	0.0	1	4.3	0	0.0
3	12	4.8	5	2.0	0	0.0	3	1.2	20	8.0	3	1.2
4A	1	1.8	1	1.8	0	0.0	0	0.0	2	3.6	2	3.5
4B	5	7.3	1	1.5	1	1.5	0	0.0	7	10.3	0	0.0
5A	3	33.3	0	0.0	0	0.0	0	0.0	3	33.3	0	0.0
5B	1	5.6	0	0.0	0	0.0	0	0.0	1	5.6	0	0.0
5C	1	3.7	0	0.0	0	0.0	1	3.7	2	7.4	0	0.0
5D	1	2.4	0	0.0	1	2.4	0	0.0	2	4.9	1	2.4
Total 5	6	6.3	0	0.0	1	1.0	1	1.0	8	8.4	1	1.1
Prof. Tr.	2	22.2	0	0.0	0	0.0	0	0.0	2	22.2	0	0.0
Surface	0	0.0	0	0.0	0	0.0	1	4.8	1	4.8	1	4.8
Total	67	4.9	29	2.1	10	0.7	16	1.2	122	8.9	18	1.3

Table 12 (cont'd).

Area	NOTCH		PERF		GRAV		FLKF		RET		UTL	
	Ct	\$	Ct	\$	Ct	\$	Ct	\$	Ct	\$	Ct	\$
1	5	1.1	6	1.3	2	0.4	13	2.9	80	18.0	106	23.8
1A	1	0.9	0	0.0	0	0.0	3	2.8	25	23.6	25	23.6
1B	1	1.5	1	1.5	0	0.0	2	2.9	11	16.2	11	16.2
2	2	0.9	0	0.0	0	0.0	9	3.9	45	19.7	26	11.4
2A	1	4.3	0	0.0	0	0.0	1	4.3	2	8.7	7	30.4
3	3	1.2	4	1.6	4	1.6	7	2.8	38	15.2	37	14.9
4A	0	0.0	0	0.0	0	0.0	1	1.8	9	16.1	15	27.8
4B	1	1.5	2	2.9	0	0.0	3	4.4	11	16.2	9	13.2
5A	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	22.2
5B	0	0.0	0	0.0	0	0.0	2	11.1	1	5.6	1	5.6
5C	1	3.7	0	0.0	0	0.0	0	0.0	7	7.4	2	7.4
5D	1	2.4	1	2.4	1	2.4	1	2.4	5	21.9	9	21.9
Total 5	2	2.1	1	1.0	1	1.0	3	3.2	13	14.7	14	14.7
Prof. Tr.	0	0.0	0	0.0	0	0.0	0	0.0	3	11.1	1	11.1
Surface	0	0.0	0	0.0	0	0.0	0	0.0	7	4.7	1	4.7
Total	16	1.2	14	1.0	7	0.5	42	3.1	244	18.4	252	18.4

Table 12 (cont'd).

Area	HAM		ANV		GRST		MANO		ABRD		CELT	
	Ct	\$	Ct	\$	Ct	\$	Ct	\$	Ct	\$	Ct	\$
1	4	0.9	3	0.7	7	1.6	6	0.2	1	0.2	2	0.5
1A	1	0.9	1	0.9	1	0.9	2	1.9	0	0.0	0	0.0
1B	4	5.9	1	1.5	0	0.0	4	5.9	0	0.0	0	0.0
2	4	1.7	2	0.9	5	2.2	13	5.7	0	0.0	0	0.0
2A	0	0.0	0	0.0	0	0.0	1	4.3	0	0.0	0	0.0
3	4	1.6	1	0.4	6	2.4	5	2.0	0	0.0	1	0.4
4A	1	1.8	1	1.8	0	0.0	0	0.0	0	0.0	0	0.0
4B	1	1.5	1	1.5	0	0.0	0	0.0	0	0.0	1	1.5
5A	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5B	1	5.6	1	5.6	0	0.0	4	22.2	0	0.0	0	0.0
5C	0	0.0	1	3.7	0	0.0	3	11.1	0	0.0	1	3.7
5D	0	0.0	0	0.0	0	0.0	0	0.0	1	0.2	1	2.4
Total 5	1	1.0	2	2.1	0	0.0	7	7.4	1	1.0	2	2.1
Prof. Tr.	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	11.1
Surface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	20	1.5	12	0.9	19	0.4	38	0.8	2	1.5	7	0.5

Examination of tool counts by functional group by area indicates that a full breadth of activities was being carried out at Skegemog Point. This situation occurs in both the main excavation blocks (Areas 1, 2, and 3), as well as a number of the smaller excavation blocks (Areas 1A, 4A, 4B, and sections of Area 5). Both the breadth of functional groups represented and the inferred levels of occupational intensity suggest that these excavated portions of the site are focal points of residential domestic activity. Significant restriction in the breadth of the functional types represented occurs in the scattered test pits to the west and south of the main excavations, and in the eastern fringes of Area 1A, along the shore of Lake Skegemog. Within Area 5, the variety of tools represented decreases from north to south.

Overall, the results of the chi-square analysis provide little information about the internal structure of the lithic assemblage from the site. The number of significantly associated pairs of tool classes are few in number and the phi coefficients are generally middle-ranged or low. As such, few expectations could be drawn as a aid in preparing the data matrices for factor analysis. The significant associations identified through chi-square and the Fisher's exact test and their associated phi coefficients are summarized in Tables 13, 14, 15, and 16.

Not surprisingly, most statistically significant associations occur when all of the excavation units are considered together (Table 13). The types of tool classes found to be significantly associated show a high degree of variability. Further, there do not appear to be any clear trends in the pattern of association from one tool class to the next. Consideration of the significant associations within the context of the functional subsets discussed above did not help. A large proportion of the possible combinations of inferred activities are represented in one fashion or another.

Table 13. Significant Chi-Square Associations Among Paired Lithic Tools: Site Total

TOOL PAIR	SIGNIFICANCE	PHI
Projectile Points/Stage 1 Bifaces	0.00020	0.69740
Projectile Points/Stage 2 Bifaces	0.00007	0.78086
Projectile Points/Bifaces	0.00000	1.38669
Projectile Points/Pieces Esquillees	0.00000	1.20076
Projectile Points/Endscrapers	0.00003	0.90763
Projectile Points/Sidescrapers	0.00006	0.78245
Projectile Points/Unifaces	0.03535	0.63048
Projectile Points/Retouched Flakes	0.00000	1.40200
Projectile Points/Utilized Flakes	0.00000	1.43744
Projectile Points/Anvilstones	0.00013	0.51972
Projectile Points/Grinding Implements	0.00012	0.76982
Projectile Points/Celts	0.00000	0.71296
Projectile Points/Cores	0.00000	1.18825
Projectile Points/Debitage	0.00000	1.52466
Stage 1 Bifaces/Stage 2 Bifaces	0.00007	0.60927
Stage 1 Bifaces/Bifaces	0.00000	0.91223
Stage 1 Bifaces/Pieces Esquillees	0.00000	0.84312
Stage 1 Bifaces/Endscrapers	0.03258	0.53170
Stage 1 Bifaces/Sidescrapers	0.00000	0.89848
Stage 1 Bifaces/Unifaces	0.00018	0.58991
Stage 1 Bifaces/Retouched Flakes	0.00000	0.79194
Stage 1 Bifaces/Utilized Flakes	0.00000	0.99685
Stage 1 Bifaces/Hammerstones	0.00120	0.50302
Stage 1 Bifaces/Celts	0.00000	0.65177
Stage 1 Bifaces/Cores	0.00000	0.92416
Stage 1 Bifaces/Debitage	0.00039	0.98011
Stage 2 Bifaces/Bifaces	0.00000	1.02209
Stage 2 Bifaces/Pieces Esquillees	0.00366	0.69510
Stage 2 Bifaces/Endscrapers	0.04687	0.58286
Stage 2 Bifaces/Unifaces	0.00003	0.67382
Stage 2 Bifaces/Retouched Flakes	0.00000	1.02351
Stage 2 Bifaces/Utilized Flakes	0.00000	1.08434
Stage 2 Bifaces/Hammerstones	0.03550	0.45323
Stage 2 Bifaces/Cores	0.00464	0.78815
Stage 2 Bifaces/Debitage	0.03273	0.98525
Stage 2 Bifaces/Sherds	0.00168	1.10549
Bifaces/Drills	0.03245	0.50822

Table 13 (cont'd).

TOOL PAIR	SIGNIFICANCE	PHI
Bifaces/Pieces Esquillees	0.00000	1.05579
Bifaces/Endscrapers	0.00002	0.95792
Bifaces/Sidescrapers	0.00000	1.12208
Bifaces/Unifaces	0.00000	0.88394
Bifaces/Retouched Flakes	0.00000	1.47065
Bifaces/Utilized Flakes	0.00000	1.49060
Bifaces/Hammerstones	0.05684	0.57609
Bifaces/Anvilstones	0.00617	0.44507
Bifaces/Celts	0.00180	0.58908
Bifaces/Cores	0.00000	1.27891
Bifaces/Debtage	0.00000	1.62083
Drills/Flake Knives	0.10000	0.18452
Drills/Hammerstones	0.00720	0.28579
Drills/Anvilstones	0.01080	0.27980
Pieces Esquillees/Endscrapers	0.00600	0.26699
Pieces esquillees/Sidescrapers	0.00300	0.28954
Pieces Esquillees/Denticulates	0.02620	0.22800
Pieces esquillees/Perforators	0.01920	0.24080
Pieces Esquillees/Flake Knives	0.00560	0.27217
Pieces Esquillees/Retouched Flakes	0.00170	0.30259
Pices Esquillees/Hammerstones	0.00400	0.28548
Pieces Esquillees/Grinding Implements	0.01430	0.24788
Pieces Esquillees/Manos	0.03360	0.21359
Pices Esquillees/Cores	0.00120	0.31123
Endscrapers/Sidescrapers	0.00010	0.38740
Endscrapers/Notches	0.00820	0.26620
Endscrapers/Flake Knives	0.00000	0.40874
Endscrapers/Retouched Flakes	0.00000	0.40554
Endscrapers/Hammerstones	0.00860	0.26333
Endscrapers/Anvilstones	0.01660	0.24614
Endscrapers/Grinding Implements	0.00820	0.26620
Endscrapers/Cores	14.00000	0.30773
Sidescrapers/Denticulates	0.00280	0.30259
Sidescrapers/Notches	0.03670	0.22003
Sidescrapers/Perforators	0.00000	0.41987
Sidescrapers/Flake Knives	25.00000	0.29955
Sidescrapers/Retouched Flakes	0.00000	0.41726
Sidescrapers/Hammerstones	0.01990	0.24029

Table 13 (cont'd).

TOOL PAIR	SIGNIFICANCE	PHI
Sidescrapers/Cores	0.00290	0.29223
Denticulates/Notches	0.01710	0.25594
Denticulates/Retouched Flakes	0.05030	0.20410
Denticulates/Cores	0.05880	0.19927
Notches/Perforators	0.06330	0.21080
Notches/Retouched Flakes	0.00710	0.27030
Notches/Cores	0.04250	0.21104
Perforators/Retouched Flakes	0.00500	0.28321
Perforators/Hammerstones	0.00080	0.34326
Perforators/Cores	0.02500	0.23317
Flake Knives/Retouched Flakes	0.00080	0.32430
Flake Knives/Hammerstones	0.00200	0.30961
Flake Knives/Grinding Implements	0.00040	0.35272
Retouched Flakes/Hammerstones	0.05220	0.20061
Retouched Flakes/Cores	0.02730	0.21847
Hammerstones/Manos	0.05360	0.20488
Grinding Implements/Manos	0.10190	0.17968

The lack of patterning is even more evident when the phi coefficients for the significant tool associations are examined (Table 13). In virtually all cases, the degree of association is weak. Phi only exceeds 0.5 in one instance and 0.4 in seven instances. Most values are less than 0.3.

One can initially conclude that there is little systematic structure to the lithic tool assemblage at the site and that it is the product of inseparable, overlapping activity areas and/or occupations. This type of result, however, has been anticipated and discussed by Carr (1984, 1987) and Whallon (1984). Both authors note that when a total tool inventory is used across an entire site, it is implicitly assumed that a singular structure to the assemblage is present is made (Carr 1984:110-113, 1987:240-241; Whallon 1984:244). The presence of meaningful artifact patterns which have a "global structure" (Carr 1987:241) will, in part, be a product of site size, its functional specificity, and the degree of overlap in activity areas and successive occupations. In this light, the lack of patterning in the tool associations and the weakness of those associations may, in fact, be viewed as an indicator that global structuring of the tool assemblage is not present and there is a degree of spatial complexity and functional variation present across the site. As will be seen below, this phenomenon repeats itself in the factor analysis.

In Area 1, relatively strong associations are exhibited between several pairs of tools which are broadly associated with fabrication activities (Table 14). Included here are drills/gravers, end scrapers/flake knives, and perforators/hammers. Stage 1 bifaces and side scrapers also exhibit a strong association. Moderate strengths of association (greater than 0.6) are displayed among a number of tool types associated with stone tool manufacture (bifacial preforms) and several types of processing/fabrication activities (bifaces and retouched flakes). The association of bifaces with their unfinished counterparts is not surprising.

Table 14. Significant Chi-Square Associations Among Paired Lithic Tools: Area 1

TOOL PAIR	SIGNIFICANCE	PHI
Projectile Points/Stage 1 Bifaces	0.00760	0.64852
Projectile Points/Endscrapers	0.08060	0.45637
Projectile Points/Sidescrapers	0.08060	0.45637
Projectile Points/Flake Knives	0.03590	0.53333
Stage 1 Bifaces/Stage 2 Bifaces	0.06780	0.46923
Stage 1 Bifaces/Bifaces	0.00760	0.64852
Stage 1 Bifaces/Pieces Esquillees	0.02470	0.56354
Stage 1 Bifaces/Sidescrapers	0.00110	0.76923
Stage 1 Bifaces/Perforators	0.08780	0.46225
Stage 1 Bifaces/Flake Knives	0.08060	0.45637
Stage 1 Bifaces/Retouched Flakes	0.07000	0.47763
Stage 2 Bifaces/Bifaces	0.00760	0.64852
Stage 2 Bifaces/Denticulates	0.04340	0.52105
Stage 2 Bifaces/Retouched Flakes	0.07000	0.47763
Bifaces/Pieces Esquillees	0.04940	0.50892
Bifaces/Endscrapers	0.08060	0.45637
Bifaces/Sidescrapers	0.00850	0.64501
Bifaces/Retouched Flakes	0.01610	0.60560
Drills/Gravers	0.02210	1.00000
Endscrapers/Sidescrapers	0.06780	0.46923
Endscrapers/Flake Knives	0.00040	0.83267
Endscrapers/Retouched Flakes	0.04340	0.52105
Sidescrapers/Flake Knives	0.07420	0.46437
Sidescrapers/Retouched Flakes	0.04340	0.52105
Notches/Perforators	0.08330	0.48889
Perforators/Hammerstones	0.00310	0.74444

The patterns exhibited in Area 1 are interpreted as indicating that a range of activities occur in this part of the site, and that a variety of fabrication tasks are taking place in conjunction with stone tool manufacture and hunting related activities. The persistence of relatively few highly significant pairings of tool classes and only moderately strong associations may be an indication that multiple activities occur.

The Fisher's Exact test employed for Area 2 indicates only four highly significant pairs of tool associations with relatively strong phi coefficients (Table 15). Included are drills/anvils, denticulates/notches, denticulates/cores, and hammers/flake knives. An emphasis on the fabrication of items involving the use of dense, hard materials, such as wood and bone is indicated for Area 2. The association of cores with an expedient tool form, such as denticulated flakes, may be the result of the need to periodically replace the supply of minimally retouched flake tools.

Fewer significant associations are indicated for Area 3. Stage 1 bifaces and side scrapers along with stage 2 bifaces and notches are the only pairs of tools which could be considered associated at the 0.05 level of significance (Table 16). Projectile points and end scrapers, and drills and hammers are close with significance levels between 0.06 and 0.07. While there appears to be a wide range of activities carried out in this locale, the strength of the associations continues to be relatively weak.

Treatment of the tool classes as nominal scale variables failed to clearly elucidate any strong patterns of association either across the site in general, or in the main excavation blocks. It appears that chi-square is not adequately sensitive to elucidate the underlying structure of the tool assemblage. Limitations inherent in the use of nominal scale data as well as cultural and depositional factors are contributing factors to this situation.

The results of the factor analysis using all of the excavation units at the site produced somewhat ambiguous results. A five factor solution accounting for 68.9% of

Table 15. Significant Chi-Square Associations Among Paired Lithic Tools: Area 2

TOOL PAIR	SIGNIFICANCE	PHI
Stage 2 Bifaces/Pieces Esquillees	0.10256	0.53675
Stage 2 Bifaces/Manos	0.10256	0.54762
Bifaces/Grinding Implements	0.10839	0.56667
Drills/Anvilstones	0.03849	0.77850
Sidescrapers/Notches	0.07692	0.63960
Denticulates/Notches	0.03846	0.77850
Denticulates/Cores	0.03497	0.69282
Flake Knives/Hammerstones	0.03497	0.69282
Hammerstones/Grinding Implemetns	0.10839	0.56667
Grinding Implements/Manos	0.06993	0.59161

Table 16. Significant Chi-Square Associations Among Paired Lithic Tools: Area 3

TOOL PAIR	SIGNIFICANCE	PHI
Projectile Points/Endscrapers	0.60480	0.43207
Stage 1 Bifaces/Sidescrapers	0.04470	0.50909
Stage 2 Bifaces/Notches	0.05130	0.50000
Drills/Hammerstones	0.06880	0.51605

the cumulative variance was produced (Table 17). Of the 20 variables employed, 11 load highly on the first factor. Tools representing hunting activities, stone tool manufacture, and a variety of different fabrication activities are present. In addition, a number of the tool classes in Factor 1 are those which lack any degree of functional specificity. Factors 2, 3, and 4 are all similar to one another in that they are defined by the presence of coarse stone tools. Each of these three factors is defined by one variable that loads highly on the factor and at least one other variable with a moderate loading on the factor in conjunction with a second factor. The fifth factor is defined only by drills.

The separation of the tool assemblage into two parts, chipped stone tools and coarse stone tools, along with the spreading of variance of the latter group across three factors is not considered highly meaningful. Instead it is viewed as the result of treating the site as a palimpsest that masks potentially meaningful patterns of intercorrelation within specific areas of the site. The results of this portion of the analysis were not plotted spatially.

Factor analysis utilizing excavation units from Area 1 produced a three factor solution which accounts for 76.6% of the cumulative variance (Table 18). These factors are somewhat difficult to interpret. Factor 1 is defined by a relatively broad range of tool types and inferred functions/activities. Included here are projectile points, stage 1 bifaces, bifaces, end scrapers, anvil stones, and manos. An additional four variables (pieces esquillees, retouched flakes, cores, and debitage) exhibit moderate loadings on Factor 1 and Factor 2, while a fifth variable (side scrapers) is split between Factor 1 and Factor 3. Factor 2 is defined by both stone tool manufacturing and fabrication related variables. In both instances, only a single variable loads highly; the rest share their variance with Factor 1. Although relatively low, grinding stones also exhibit their highest loading on this factor. Factor 3 appears to be a fabrication related factor defined by hammerstones, side scrapers and a lack of grinding stones.

Table 17. Rotated Factor Solutions: Site Total

TOOL TYPE	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5
Projectile Points	0.57717	0.30521	0.07347	0.32217	-0.18459
Stage 1 Bifaces	0.66760	-0.13947	0.18155	0.33557	-0.09923
Stage 2 Bifaces	0.69929	0.06883	0.03386	-0.27024	0.26526
Bifaces	0.73261	0.09178	0.27109	0.07995	0.09799
Drills	0.03684	0.07253	0.07378	0.07565	0.91591
Pieces Esquillees	0.65786	0.23653	-0.01319	0.32133	-0.07055
Endscrapers	0.39141	0.17349	0.31387	0.41169	0.25545
Sidescrapers	0.61161	-0.02751	0.46808	0.12463	-0.27324
Unifaces	0.71454	-0.26516	0.17413	-0.24832	0.06502
Retouched Flakes	0.76725	0.34875	0.08011	0.15589	0.22127
Utilized Falkes	0.85421	0.19264	-0.03494	0.19307	0.03734
Hammerstones	0.18069	0.03887	0.83147	-0.06957	0.13459
Anvilstones	0.06418	0.52141	0.17413	0.48073	0.30121
Grinding Implements	0.20122	0.83067	-0.13601	-0.04797	0.10157
Manos	-0.00896	0.69994	0.51147	-0.06586	-0.09318
Celts	0.16165	-0.08209	-0.12843	0.74711	0.02123
Cores	0.79590	0.03041	-0.01072	0.22195	-0.05211
Debitage	0.83925	0.10149	0.28361	0.09103	0.06437
% of Variance	38.5	10.5	7.7	6.5	5.7
Eigenvalues	6.93665	1.89683	1.38048	1.16341	1.01866

Table 18. Rotated Factor Solutions: Area 1

TOOL TYPE	FACTOR 1	FACTOR 2	FACTOR 3
Projectile Points	0.75025	0.36540	-0.03210
Stage 1 Bifaces	0.80796	0.31832	0.10256
Stage 2 Bifaces	0.17129	0.90231	-0.14912
Bifaces	0.82658	0.40048	0.16507
Pieces Esquillees	0.64941	0.61523	-0.18383
Endscrapers	0.64385	0.18330	-0.00035
Sidescrapers	0.72635	0.14667	0.56313
Unifaces	-0.07940	0.78077	0.42406
Retouched Flakes	0.60993	0.63042	0.02406
Hammerstones	0.13914	0.11279	0.87366
Anvilstones	0.73739	-0.18908	-0.30679
Grinding Implements	0.35189	0.41892	-0.63555
Manos	0.64116	-0.10837	-0.44325
Cores	0.77166	0.51477	-0.00525
Debitage	0.58568	0.75260	0.09658
% of Variance	51.0	15.0	10.6
Eigenvalues	7.64250	2.24649	1.59458

As can be seen in Figure 50, the spatial distribution of the factors across Area 1 is highly overlapping. Factors 1 and 2 exhibit nearly identical distributions. The only place where they do not exactly coincide is in Unit 50, where Factor 2 is absent. Within the central portion of the excavation block, there is a clear northwesterly trend to the factors. Factors 1 and 2 are most clearly expressed in Units 1, 2, 4, 6, 7, and 84, with a disruption of the distribution occurring in Unit 82. Factor 3 is the most spatially discrete of the factors, occurring only in Units 1, 84, and 50. In the southern section of Area 1 only two factors, Factors 1 and 2, are strongly expressed, and this occurred in Unit 51. Factor 3 is expressed solely by the occurrence of hammerstones in the adjacent unit, Unit 57.

Interpretation of the structure of these factors and their spatial distribution is somewhat problematic. It would appear that Area 1 reflects the trends established in the factor analysis of the entire site. The results obtained in Area 1 may be explained as the product of two processes, one is taphonomic and the other one is methodological. As discussed in other sections of this study, Area 1 contains ceramics from the three main ware groups represented at the site: Bowerman, Skegemog, and Traverse wares. It also contains one of the densest concentrations of hearths encountered in the excavations. The derived factors appear to be a result of overlapping activity sets and activity areas from sequential occupations. The large grid size employed in the excavation also affects the factor solution. The larger grid size serves to merge spatial data that may have been discriminated if smaller units had been excavated.

The factor analysis of data from Area 2 consisted of a three factor solution which explains 79.8% of the shared variance (Table 19). These factors are more useful in interpreting activities in Area 2. Factor 1 exhibits high loadings on unfinished bifaces, pieces esquillees, end and side scrapers, unifaces, cores, and chert debitage. This factor is interpreted as a fabrication unit. The occurrence of cores and debitage in

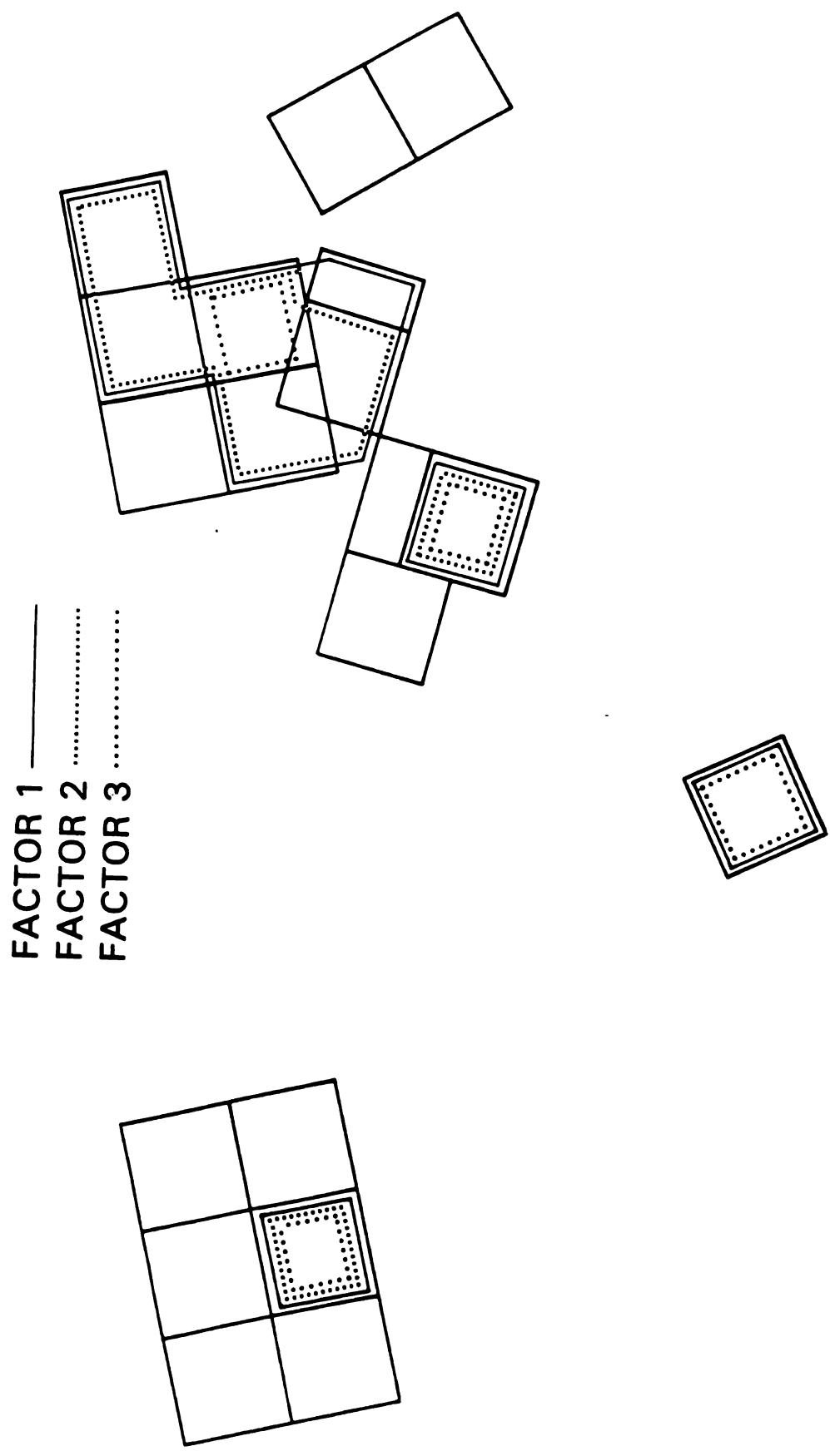


Figure 50. Plotted Lithic Factor Solutions: Area 1

Table 19. Rotated Factor Solutions: Area 2

TOOL TYPE	FACTOR 1	FACTOR 2	FACTOR 3
Projectile Points	-0.18465	0.12897	0.81284
Bifacial Preforms	0.63517	0.15623	0.36583
Bifaces	0.49851	-0.19280	0.79980
Pieces Esquillees	0.81786	0.17438	0.22390
Endscrapers	0.79526	0.18933	0.04458
Sidescrapers	0.93933	0.09872	-0.09032
Unifaces	0.95115	-0.13895	0.05381
Retouched Flakes	0.37024	0.49232	0.69861
Hammerstones	0.25838	0.80895	0.16907
Grinding Implements	-0.12840	0.90802	-0.00662
Manos	0.04970	0.96029	0.02985
Cores	0.75003	-0.25512	0.41917
Debitage	0.62106	0.06882	0.59765
% of Variance	45.4	21.7	12.7
Eigenvalues	5.90280	2.82474	1.65254

this factor is viewed as a result of the expedient nature of many of the fabrication tools. Thus, replacements are needed on a relatively frequent basis. Factor 2 is characterized by coarse stone tools, primarily hammerstones, anvil stones and grinding surfaces. All of these can be associated with processing plant resources and food preparation activities. The third factor appears to be a hunting and associated processing related factor. Projectile points, bifaces, retouched flakes, cores and chert debitage comprise this factor. Again, the splitting of some of the variables across two factors is viewed as a product of their multi-functional character.

All three factors are restricted to the central and southern portions of Area 2 (Figure 51). The distribution of the factors also partially overlap, although not to the degree seen in Area 1. However, factors which can be associated with male and female activities only overlap in one excavation unit, while Factor 2, a general refuse factor, overlaps them equally. This may be the initial indication of the presence of a structure in this area. Factor 1 occurs across the middle of the excavation block and is most completely expressed in Units 163 and 175 along its southern edge. Factor 2 is uniformly expressed across the northeastern section of the block and displays fairly good spatial separation from Factor 1. Factor 3, however, shows a fair degree of overlap with the distribution of Factor 1. The only unit in which the two factors do not overlap is Unit 154.

In this instance, it appears that the factor analysis was successful in identifying patterns of shared variance among the tool classes which can be interpreted as activity sets. Food processing and preparation activities appear to be occurring separately from the other activities represented in this portion of the site. While fabrication and hunting related activities overlap in their occurrence, there is a difference in the nature of their distribution. The former appears to be more evenly distributed, while the latter is somewhat more concentrated at the southern end of its distribution.

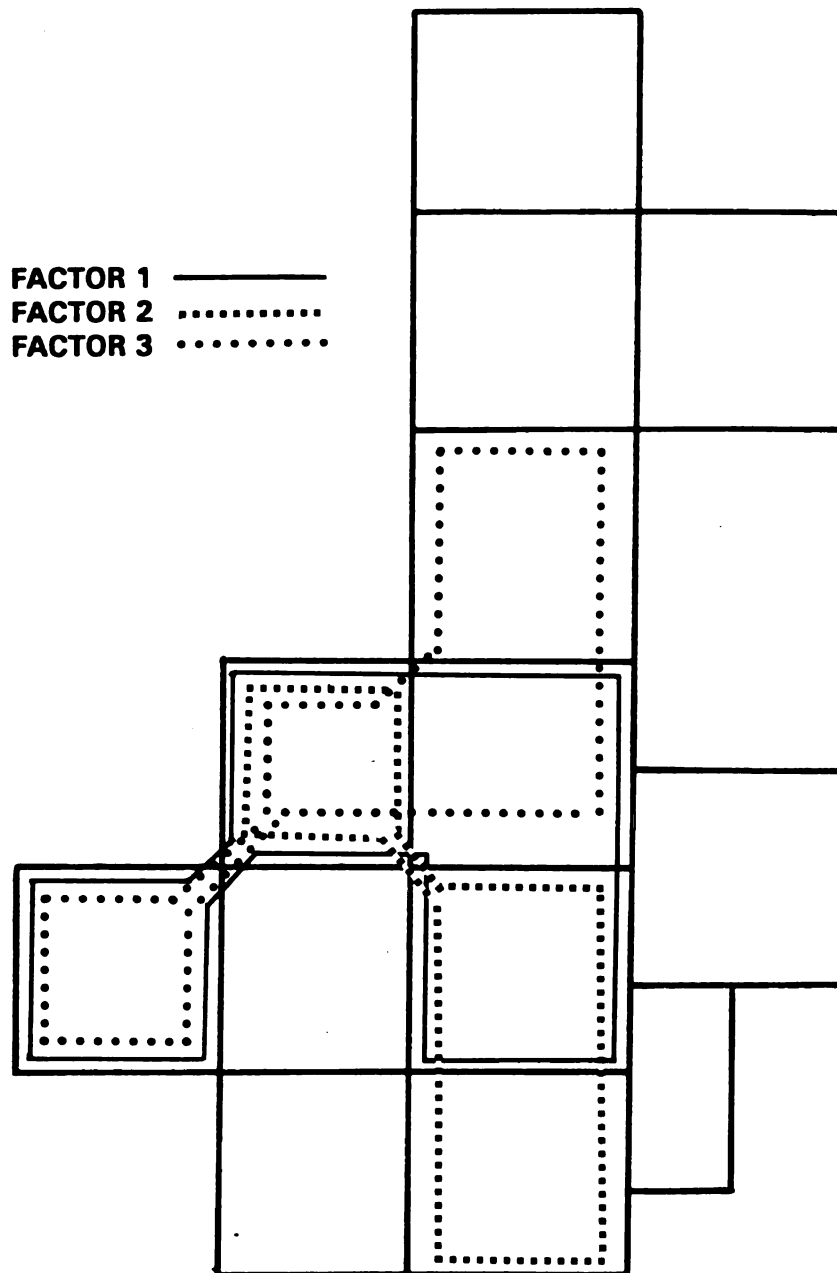


Figure 51. Plotted Lithic Factor Solutions: Area 2

The results of the factor analysis of Area 3 clearly differ from Areas 1 and 2. A five factor solution that explains 80.3% of the cumulative variance was obtained (Table 20). Factor 1 contains elements of all three broad functional subsets, although hunting and fabrication tasks involving wedging/splitting and scraping most strongly define the factor. The second factor appears to be a generalized fabrication set including bifaces and a variety of unifacial tools. Elements of stone tool manufacture are also exhibited. This may be an indication that the need to replace the tools during the execution of the fabrication tasks was anticipated. Factor 3 loads heavily on retouched flakes. This factor may be related to plant processing activities. Both retouched flakes and cores along with grinding implements exhibit relatively high loadings on this factor, while debitage exhibits a moderate loading. Factor 4 is defined by hammerstones and end scrapers, the latter of which splits its variance between Factors 1 and 4. The connection between pounding tools and hide working tools is unclear. The fifth and final factor is defined by a single variable, stage 2 bifaces. It may be considered an indicator of late stage tool manufacturing activities. Since these bifaces do not clearly associate with any other tool class, it introduces the possibility that they were produced and cached in anticipation of needs away from the site.

Distribution of the factors is largely restricted to the southern and eastern two-thirds of Area 3 (Figure 52). Factor 1 exhibits a rather convoluted spatial distribution stretching across the approximate center of this portion of the excavation block. Through most of this area the factor is represented by only two or three variables, except in Unit 70 where it is represented by five of the six defining variables. Factor 2 also basically occurs in the center of this part of the block, although it is more compact in its distribution. Throughout this area the factor is represented by no more than two of the defining variables. Interestingly, the variable pairs tend to be either stage 1 bifaces and finished bifaces as in Units 38 and 42, or bifaces and unifaces as in Units

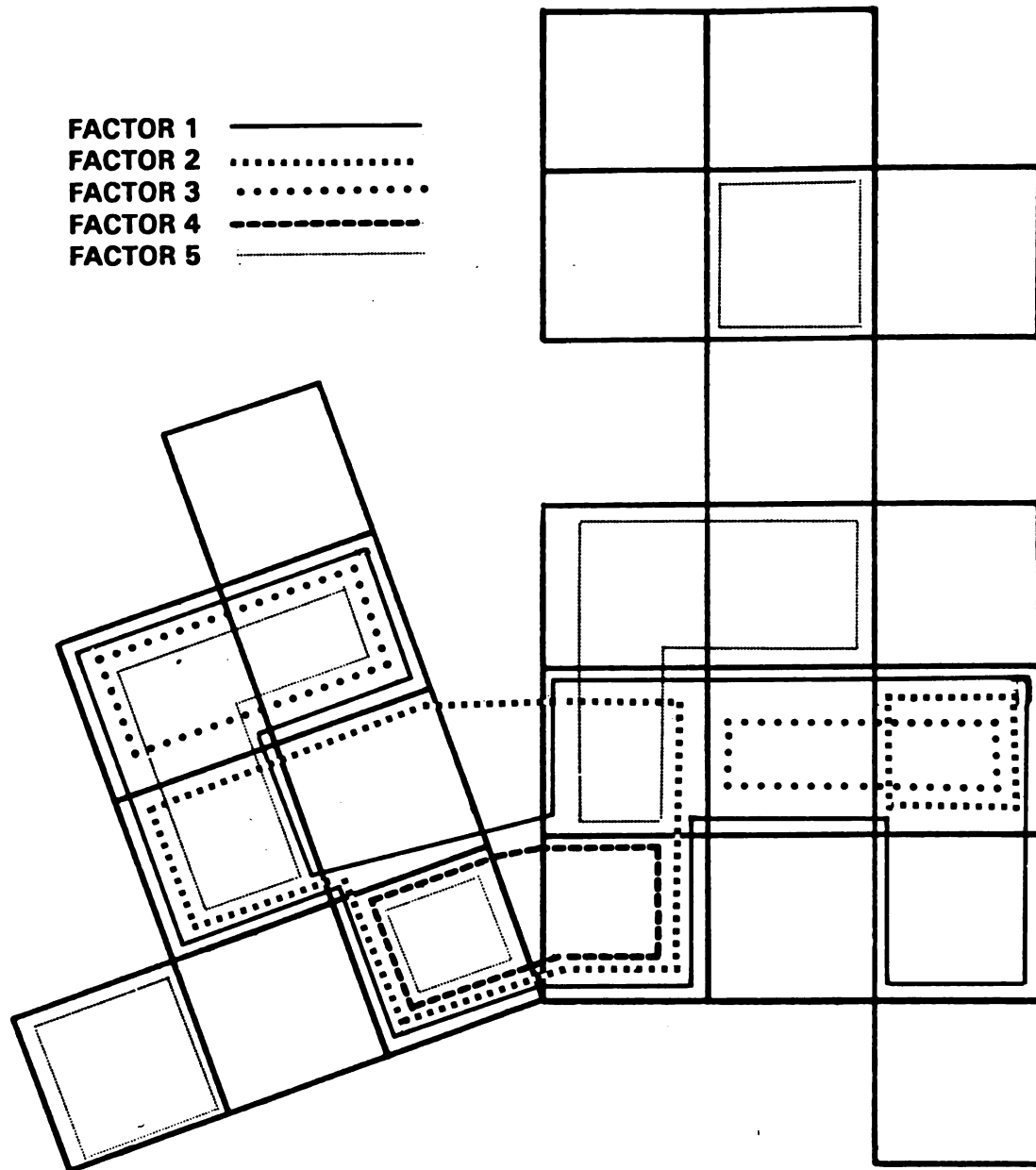


Figure 52. Plotted Lithic Factor Solutions: Area 3

Table 20. Rotated Factor Solutions: Area 3

TOOL TYPE	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5
Projectile Points	0.80097	-0.01383	0.19702	0.20300	-0.02580
Stage 1 Bifaces	0.55582	0.69104	0.04068	-0.20638	-0.12255
Stage 2 Bifaces	0.01297	0.07831	0.03361	0.16020	0.92989
Bifaces	-0.03910	0.75802	0.17276	0.11414	0.16633
Pieces Esquillees	0.75292	0.22677	0.30721	-0.01037	-0.32105
Endscrapers	0.56985	-0.15368	0.18360	0.64480	0.30034
Sidescrapers	0.80698	0.19640	-0.07187	-0.13482	0.27574
Unifaces	0.21866	0.74502	-0.09305	0.21824	-0.01427
Retouched Flakes	0.05929	0.39751	0.65843	-0.40108	0.31315
Hammerstones	-0.08268	0.35827	-0.04226	0.84977	0.11489
Grinding Implements	0.20053	-0.28072	0.83831	-0.01383	0.06112
Cores	0.15571	0.32042	0.80831	0.18787	-0.13498
Debitage	0.59816	0.51833	0.40452	-0.00984	-0.03713
% of Variance	34.20000	14.0	12.5	11.5	8.1
Eigenvalues	4.44135	1.81149	1.63138	1.49578	1.05382

44 and 74. An additional isolated occurrence of Factor 2 is located in Unit 69. Incidentally, this factor is represented by all of its defining variables only in this latter excavation unit, possibly indicating a spatial focus to some of the fabrication activities.

Factor 3 is spatially disjunct in its occurrence. It is located in two adjacent sets of units in the north central and the southwestern corner of Area 3. The occurrence of plant/food processing activities at the fringes of the overlapping activity sets is reminiscent of the situation in Area 2. The fourth factor occurs only in two contiguous units in the east central portion of the excavation block. Spatial discontinuity is seen in the distribution of Factor 5. An isolated occurrence of the factor is present towards the western edge of the block in Unit 59, while its most extensive occurrence is across three contiguous units (62, 65, and 68) in the central portion of the block. Factor 5 also is found in Unit 44. In each of the units comprising the first two areas of occurrence of Factor 5, stage 2 bifaces are represented by only a single specimen, while four specimens occur in Unit 44. This latter area may be considered the best candidate for a discrete area of late stage biface reduction.

In addition to the three areas analyzed above, there are a series of other groups of excavation units which are not amenable to R-mode factor analysis due to sample size limitations. A consideration of the tools recovered in these portions of the site, at least in terms of the functional subsets represented, is warranted. This portion of the discussion proceeds from north to south across the site.

Area 1B, located north and east of Area 1, is a loose grouping of nine excavation units. Two of the units, 8 and 106, exhibit relatively high numbers of tools (0.29 per cubic foot) and debitage (7.8 per cubic foot), as well as breadth in the range of types represented. The individual frequency of any particular tool type, however, is generally low. The only exception to this is projectile points (N=7) and fragmentary bifaces (N=4) in Unit 8 and hammerstones (N=3) in Unit 106. These two units, which are somewhat spatially isolated, lie north of Area 1 along the same orientation as the

occupational focus identified in that area. This, with the relatively high density of tools and tool types, suggests that they may represent a continuation of the occupational focus in the northern part of the site and as such should be considered more a part of Area 1 than Area 1B.

The other units comprising Area 1B are clustered together on the Nipissing age beach. Overall, tool and debitage densities are low in these units, with the highest density of 0.09 tools and 2.0 flakes per cubic foot occurring in Unit 9, the northernmost unit. Tool forms represented include projectile points, bifaces, scrapers, unfinished bifaces, a piece esquillee, an anvil, and a mano, in addition to several expedient retouched flake tools. Tool frequencies are consistently low and generally exceed no more than one specimen per tool type. While the structure of the activity(ies) carried out here is not well defined, it does appear to be an area of low intensity activity and an area in which no single activity dominates.

Area 1A, located east of Area 1, contains seven excavation units, two of which produced only small amounts of debitage. In general, debitage densities are equal to the mean for the site and tool densities are nearly one standard deviation below the site mean (Table 10). The vast majority of the recovered tools and debitage occur in the contiguous units of Area 1B. All three of the main functional subsets are represented in this area of the site; however, on closer inspection some functional specificity does appear to be present. The tool assemblage is dominated by bifaces, end scrapers, and, to a lesser extent, projectile points (Table 10). This is interpreted as an indication that hunting and processing of hunted game were primary activities carried out here. The ubiquitous flake knives, retouched flakes and utilized flakes are also well represented. A small number of general fabrication tools in the form of side scrapers, drills, pieces esquillees, and a hammer are also present (Table 12).

Area 4A is located a short distance due south of Area 1A. As with the previous area, average densities of debitage and below average densities of tools occur in this

portion of the site (Table 10). Hunting and processing related tools, such as projectile points, bifaces, and retouched flakes dominate the tool forms in conjunction with unfinished bifaces (Table 12). Unlike Area 1B, hide processing does not appear to be a significant activity in Area 4A.

Area 4B is located approximately halfway between Areas 1 and 2. The density of materials exceeds one standard deviation of the mean for both tools and debitage (Table 10). Except for projectile points and unfinished bifaces, no particular type or group of tools dominate the assemblage in this part of the site. The range of tool forms present is broader than seen in the previous two excavation areas. Several relatively rare fabrication tools, two drills and a celt, also occur here. In this sense, Area 4B more closely resembles the breadth of tool forms seen in those areas of the site identified as foci of residential activity.

The final excavation area to be discussed is Area 5. The excavation units comprising this area are grouped into four subsets. Overall, Area 5 exhibits extremely low debitage and tool densities (Table 10). However, upon closer examination this figure appears to be somewhat misleading. The low density pattern holds for sub-Areas 5A, 5B, and to a lesser extent with 5C. Unit 183 in sub-Area 5B exhibits a slight concentration of tools including three bifaces, a piece esquillee, an endscraper, a flake knife, a utilized flake, a hammer, an anvil, and two manos (Table 12). The meaning of this slight tool concentration is unclear at this time. In contrast to these portions of Area 5, the northern halves of sub-Areas 5C and 5D exhibit tool and debitage densities close to the site averages (Table 10). Not only are the overall frequencies of the tools and debitage relatively high, but the range of tool forms represented is very broad (Table 12). Virtually all of the tool forms identified at the site are represented here. It is hypothesized that these units sample residential/domestic focused activity sets and areas.

In sum, the analysis of the lithic assemblage provides a wide range of information concerning its structure and distribution across the site. It is clear that the Skegemog Point site sits towards the terminal end of the lithic reductive sequence. Although all stages of reduction are represented, there is clear evidence of an emphasis on middle and late stage tool manufacture. Tool production, however, does not appear to be an overly dominating activity, as seen at the O'Neil (Lovis 1973) and Pine River Channel sites (Holman 1978).

Statistical examination of the lithic assemblage presented mixed results. The chi-square analysis failed to produce consistently interpretable results. This is viewed largely as a result of treating the variables as nominal scale data. The application of factor analysis to the main data sets met with better results, but it still represents an interpretive challenge. The residential or domestic orientation of the main excavation blocks at the site is indicated. These areas are characterized by what appears to be highly overlapping activity areas. Although blurred and in some instances very vaguely defined, there does appear to be some spatial separation of activities within the excavated portions of the Skegemog Point site. Both cultural and methodological processes have been invoked to help explain this situation.

CERAMIC DISTRIBUTION AND SPATIAL DYNAMICS

Consideration of the distribution of the ceramic across the Skegemog Point site followed the same process carried out with the examination of the lithic assemblage at the site. From the examination of the frequencies of the vessels assigned to the three wares utilized in this analysis it is immediately clear that there is a gradual increase in the number of vessels assigned to each type. An increase in the amount or duration of occupation through time is one explanation for this observation. The question then becomes one of where these occupations took place and how spatially expansive they were.

The pattern of the distribution of residual ceramic sherd weights across the various excavation units and blocks basically parallels that seen with the lithic debitage (Table 21). Among the main excavation blocks, the highest density of ceramic sherds is seen in Area 1, followed by Area 3 and then Area 2. As with the lithic debitage, the ceramic sherd weight per cubic foot reaches its highest value in Area 4B, which incidentally is one of the smaller excavated areas at the site. Given the values seen with both the lithics and the ceramics in Area 1, 4B, and the outlying excavation units 8 and 106, it would appear there is a slight north/northeasterly trend to the distribution of the occupation across this portion of the site.

The distribution of the ceramic vessels assigned to the three wares at the site provides a degree of temporal separation of the different areas of the site. Overall, the occurrence of Bowerman ware at the site is very low. The vast majority of the recovered Bowerman ware vessels occur in Area 1. Specifically, it occurs primarily within the northern cluster of units forming Area 1. Bowerman ware is the most spatially constrained of the three ceramic wares represented at the site. A few isolated vessels also occur in Areas 1A, 2A, and 3. The low density of Bowerman ware at the site is interpreted as an indication that the Bowerman occupation of the site is limited in scope. Short duration occupational episodes could also be a contributing factor to this pattern.

Marked increase in the usage of the site area is seen with the advent of populations manufacturing Skegemog ware. The density of Skegemog ware for the site rises to 0.12, a dramatic increase over the value seen for Bowerman ware (Table 21). Skegemog ware occurs in nearly every excavation area at the site, albeit in widely varying frequencies, with the exception of Area 1B. As noted previously, this area of the site contains very little in the way of artifactual remains. As such, it probably represents one of the limits of the site. The bulk of the Skegemog ware was recovered

Table 21. Ceramic Sherd Weights and Vessel Counts by Area

AREA	CUBIC FEET	SHERDS gm	BOWERMAN	SKEGEMOG	TRAVERSE
1	1820	33.13	0.38	0.79	0.36
1A	512	10.17	0.12	0.14	0
1B	420	0.38	0	0	0.002
2	1150	14.76	0	0.02	0.45
2A	90	7.12	0.02	0.07	0.03
3	2100	24.46	0.005	0.04	0.09
4A	480	8.68	0	0.002	0.002
4B	240	52.65	0	0.07	0.04
5	877.5	14.17	0.002	0.12	0.35
SITE TOTAL	7687.5	22.06	0.001	0.26	0.4

Table 22. Significant Chi-Square Associations Among Paired Artifact Classes: Area 1

TOOL PAIRS	SIGNIFICANCE	PHI
Projectile Points/Stage 1 Bifaces	0.01007	1.32986
Projectile Points/Stage 1 Bifaces	0.00149	1.94977
Projectile Points/Pieces Esquillees	0.02119	1.79776
Projectile Points/Endscrapers	0.04543	1.37815
Projectile Points Sidescrapers	0.00448	1.52866
Projectile Points/Cores	0.05952	2.01505
Projectile Points/Bowman Ware	0.00540	2.08083
Stage 1 Bifaces/Bifaces	0.00368	1.38921
Stage 1 Bifaces/Pieces Esquillees	0.01761	1.29386
Stage 1 Bifaces/Endscrapers	0.03915	0.99675
Stage 1 Bifaces/Sidescrapers	0.00857	1.10135
Stage 1 Bifaces/Hammerstones	0.05464	0.74918
Stage 1 Bifaces/Manos	0.00050	1.04704
Stage 2 Bifaces/Bowman Ware	0.01831	1.42237
Stage 2 Bifaces/Traverse Ware	0.00203	1.55158
Bifaces/Endscrapers	0.01578	1.45249
Bifaces/Sidescrapers	0.00116	1.60078
Bifaces/Unifaces	0.01679	1.44844
Bifaces/Bowman Ware	0.04431	1.94595
Bifaces/Traverse Ware	0.01220	2.03296
Pieces Esquillees/ Endscrapers	0.01105	1.47516
Pieces Esquillees/Retouched Flakes	0.03351	2.14515
Pieces Esquillees/Cores	0.01661	2.10515

in Area 1 (Table 21), continuing the pattern of occupational locale initiated by the manufacturers of Bowerman ware. All varieties of Skegemog ware are present in Area 1. The density of Skegemog ware elsewhere on the site drops off dramatically from the value of vessels per cubic foot seen in Area 1 (Table 21). It appears that through most of the Skegemog phase the population returned to one particular area of the site. That is, there was a strong preference for a particular portion of the site throughout the early Late Woodland period.

The only other areas of the site where the proportional density of Skegemog wares outweighs that of the other ceramic wares at the site is in Areas 1A, 2A, and 4B. With the exception of Area 4B, with its exceptionally high density of ceramics and lithics, these areas are characterized as zones of low intensities of occupation throughout the Late Woodland period. The occurrence of Skegemog wares in Area 4B and the lack of any analyzed Traverse wares from this excavation area suggests that it represents a continuation of the early Late Woodland occupation which sees its strongest expression in Area 1.

Traverse ware is, by far, the dominate ceramic type at the site. This suggests that the site saw its most extensive and intensive usage during the late phase of the Late Woodland period. The bulk of the Traverse wares and the area of its highest densities occur in the areas of the site south of the main occupation zones utilized during the Skegemog phase. Although Traverse ware occurs in a much lower density than Skegemog wares in Area 1, the ceramic vessel density is comparable to that of the Bowerman wares. It would appear that the occupation of the site sees an expansion in the size of the area considered suitable during the Traverse phase, rather than a lateral shift in the area of occupation. In fact, it is Area 1 and 2 at the more northern end of the site that has the highest density of Traverse ware. The seemingly low density value for this ware in Area 3 may be somewhat deceiving. Within Area 3 there is a very high density of Traverse ware in the southern portion of the block excavated in 1965. The

northern portion of the block excavated in 1966 had much lower amounts of Traverse ware, thus depressing the overall density figure for this area of the site.

The distribution of the varieties of Traverse ware shows some interesting patterns. The vast majority of the undecorated varieties occurs in the southern portions of the site, primarily Areas 2 and 3. This includes the scalloped lip varieties which cluster heavily in the southern portion of Area 3. Also clustering here are many of the Traverse Decorated, variety Pinched vessels. This, incidentally, is also where the two best candidates for structures are located. Furthermore, when the distribution of cross-unit refits is examined there are a tremendous number of ceramic refits across these units, but relatively few between the southern and the northern portions of Area 3. That is, the Traverse phase occupation within Area 3 appears to be spatially constrained. Finally, the more complexly decorated Traverse wares are neither abundant nor spatially clustered at the site. If these wares do date to the later portions of the Traverse phase as suggested in Chapter 3, then it would appear that the level of usage of the Skegemog Point site by local populations trails off sometime after the mid to late fourteenth century A.D.

The chi-square analysis was rerun with the inclusion of the ceramic wares as additional variables in order to see if any better associations between artifact classes would appear. Given the nature of the results obtained for the entire site using only the lithic artifacts, it was decided not to repeat that portion of the analysis. The results are somewhat similar to those obtained using only the lithic variables. Within Area 1 (Table 23), tools typically associated with stone tool manufacture and hunting related activities comprised most of the significant associations. Interestingly, Skegemog wares are not significantly associated with any of the tool classes while Bowerman ware was significantly associated with projectile points, stage 2 bifaces and completed bifaces and

Table 23. Significant Chi-Square Associations Among Paired Artifact Classes: Area 2

TOOL PAIRS	SIGNIFICANCE LEVEL	PHI COEFFICIENT
Bifacial Preforms/Cores	0.00730	1.26929
Bifaces/Cores	0.01831	1.76777
Retouched/Traverse Ware	0.04403	2.54951
Grinding Implements/Manos	0.00022	1.41421
Grinding Implements/Sherds	0.05043	1.41421
Grinding Implements/Traverse Ware	0.05403	1.41421

Table 24. Significant Chi-Square Associations Among Paired Artifact Classes: Area 3

TOOL PAIR	SIGNIFICANCE	PHI
Projectile Points/Pieces Esquillees	0.00063	1.22503
Projectile Points/Endscrapers	0.00798	0.89235
Projectile Point/Sidescrapers	0.00069	1.02030
Projectile Points/Bowman Ware	0.01190	1.09924
Projectile Points/Skegemog Ware	0.00008	1.78419
Stage 1 Bifaces/Bifaces	0.02144	0.61034
Stage 1 Bifaces/Pieces Esquillees	0.01954	0.71913
Stage 1 Bifaces/Sidescrapers	0.01914	0.55164
Stage 1 Bifaces/Unifaces	0.00775	0.61146
Stage 1 Bifaces/Debitage	0.04259	0.81844
Bifaces/Grinding Implements	0.05379	0.69035
Pieces esquillees/Sidescrapers	0.00301	1.01552
Pieces Esquillees/Unifaces	0.02168	0.89693
Pieces Esquillees/Bowman Ware	0.00618	1.22890
Pieces Esquillees/Skegemog Ware	0.05645	1.60265

Traverse ware are significantly associated with completed bifaces. This low tool diversity may be indicative of a limited range of activities being carried out in this portion of the site.

The number of significant associations among artifact classes in Area 2 is very low (Table 23). Fabrication related artifact classes (cores, unfinished bifaces, unifaces and intentionally retouched flakes) are significantly associated with Traverse ware. Furthermore, grinding slabs are also significantly associated with ceramic sherds, Traverse ware, and manos. This lends credence to the proposition that partially overlapping male and female related task areas occur in the excavation block.

In Area 3, a near reversal of the situation seen in Area 1 appears (Table 24). In this case, rather than seeing a significant association between Traverse ware and any of the other artifact classes, it is the other two ceramic wares, which are represented in a distinct minority, that are significantly associated with hunting and fabrication related tools, specifically projectile points and pieces esquillees. As with Area 1, this is interpreted to mean that the earlier occupations in Area 3 are very limited in the scope of the activities being carried out.

Factor analysis with the inclusion of the ceramic variables is limited to the three main excavation blocks. The results of this phase of the analysis produced results very similar to those obtained using only the lithic variables with several important differences. As alluded to above, the addition of the ceramic variables introduced a level of temporal control not available with the lithics alone. Furthermore, the amount of variance accounted for in the factors is greater in the second run than in the first. The number of extracted factors also increases, which in several instances makes their interpretation a little more difficult.

Factor analysis of Area 1 produced a five factor solution accounting for 84.2% of the cumulative variance (Table 25). The first factor has high loadings for a wide

Table 25. Rotated Lithic and Ceramic Factor Solutions: Area 1

Rotated Factor Matix

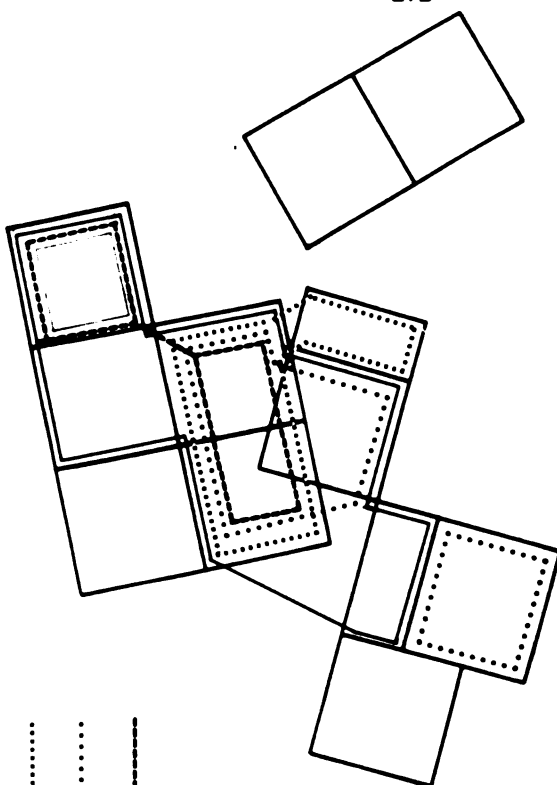
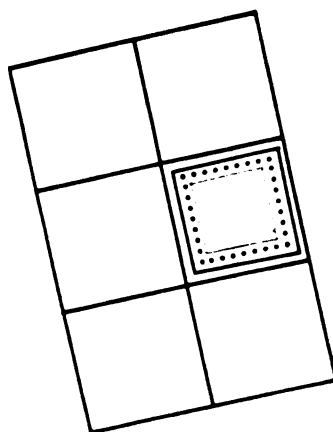
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	
PP	.59183	.28355	.35198	-.41069	.13507	
S1	.60756	.22957	.65280	-.09483	.05037	
S2	.69863	.08447	.06239	.38894	.45507	
BF	.62597	.45967	.49778	-.06941	.06758	
PE	.54125	.51451	.14558	.19541	.42228	
ES	.17016	.84713	.08831	-.04015	.07644	
SS	.37323	.51714	.50544	.06797	-.34684	
UN	.25864	.22666	.11494	.86902	-.02108	
RT	.48955	.72452	.13165	.18030	.26178	
HM	-.09952	-.10087	.74108	.41097	-.29168	
AN	.16824	.57749	.13001	-.63438	.07871	
GR	.26481	.13230	.03812	-.10539	.85313	
MA	-.13816	.15834	.76501	-.24930	.38584	
TC	.75856	.37015	.35868	-.03239	.24109	
DB	.54739	.36970	.55396	.25012	.25542	
CW	.85744	.37388	-.03061	.14903	.13598	
BO	.76272	.48187	.11811	.11129	.05853	
SK	.88770	.17437	-.08069	.25148	.09837	
TR	.91233	.03283	.01256	-.18253	.05933	
Variable	Communality	*	Factor	Eigenvalue	% of Var	Cum %
PP	1.00000	*	1	9.57351	50.4	50.4
S1	1.00000	*	2	2.20802	11.6	62.0
S2	1.00000	*	3	1.97658	10.4	72.4
BF	1.00000	*	4	1.17713	6.2	78.6
PE	1.00000	*	5	1.06455	5.6	84.2
ES	1.00000	*	6	0.73709	3.9	88.1
SS	1.00000	*	7	0.66631	3.5	91.6
UN	1.00000	*	8	0.52205	2.7	94.3
RT	1.00000	*	9	0.28252	1.5	95.8
HM	1.00000	*	10	0.25446	1.3	97.2
AN	1.00000	*	11	0.17586	0.9	98.1
GR	1.00000	*	12	0.13584	0.7	98.8
MA	1.00000	*	13	0.09513	0.5	99.3

variety of artifact classes including projectile points, stage 1, stage 2, and completed bifaces, pieces esquillees, cores, debitage, ceramic sherds, and all three of the ceramic wares represented at the site. This factor typifies the heavily overlapping nature of the occupations in this area of the site. The second factor is interpreted as a primarily processing factor with end scrapers, side scrapers, pieces esquillees, retouched flakes, and anvilstone all exhibiting moderate to high loadings. Factor 3 contains as many different tool classes as Factor 2, but their make-up is slightly different, emphasizing manufacturing activities to a higher degree than processing activities. The fourth and fifth factors are very attenuated in their composition. They contain only unifacial tools and anvils in Factor 4 and pieces esquillees and grinding slabs in Factor 5.

The spatial plot of the second factor analysis (Figure 53) is very similar to that analyzed using only the lithic assemblage. All of the factors are heavily overlapping and have a northwesterly trend to their long axes. When this information is combined with the distribution of features (i.e., hearths) in Area 1 (see Appendix 1), the distribution of the activity areas fall between the highest concentrations of hearths. In the southern group of units comprising Area 1 the activity sets are located on the south side of Feature 11, a large hearth. The reasons for this intensive level of reoccupation in this part of the site are unclear, although historical factors may be in operation here. That is, use of this area may have been somewhat habitual by the local population.

The analysis of the data collected for Area 2 produced a four factor solution (Table 26) that is very similar in its spatial plot (Figure 54) to that generated using the lithic assemblage alone. The composition of the member factors, however, changes slightly. These four factors account for 89.2% of the cumulative variance. The first factor is still interpreted as a manufacturing factor; manufacturing activities primarily associated with stone tools in the form of unfinished and finished bifaces, unifacial

FACTOR 1 —————
 FACTOR 2
 FACTOR 3
 FACTOR 4
 FACTOR 5



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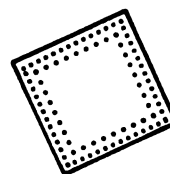


Figure 53. Plotted Ceramic and Lithic Factor Solutions: Area 1

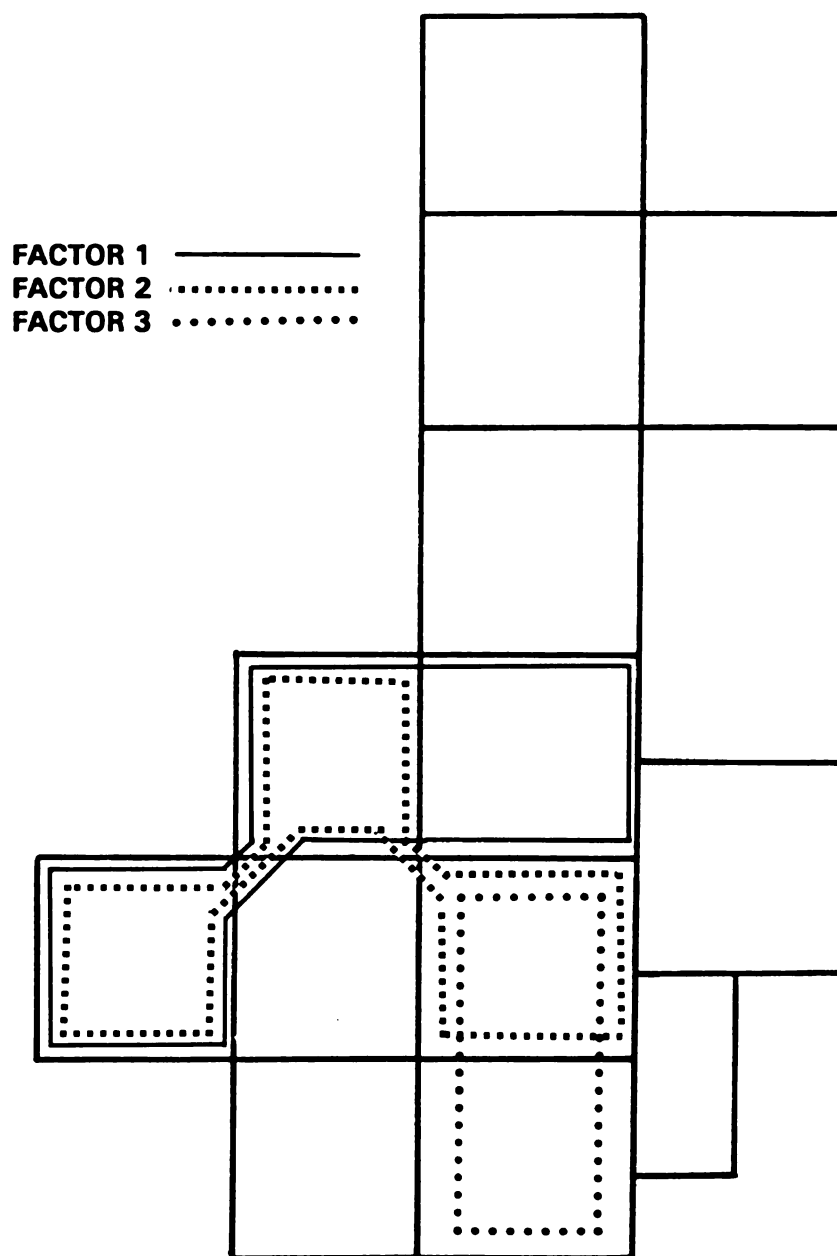


Figure 54. Plotted Ceramic and Lithic Factor Solutions: Area 2

Table 26. Rotated Lithic and Ceramic Factor Solutions: Area 2

Rotated Factor Matrix

	Factor 1	Factor 2	Factor 3	Factor 4
PP	.15678	-.03102	.03877	.93948
UB	.76247	.25153	.13424	-.22752
BF	.91869	.01703	-.17638	.28884
ESSS	.33052	.88841	-.11413	-.14706
UNRT	.83366	.25797	.39285	.16598
GR	-.05389	.03142	.96806	.02826
MA	-.03459	.28059	.92166	.07296
TC	.83102	.24290	-.29902	-.08201
DB	.58069	.56328	-.15560	.41461
CW	.11501	.90407	.29303	.08829
SK	-.42129	.46238	.31352	.61152
TR	.23647	.81114	.39003	.15865

Variable	Communality	*	Factor	Eigenvalue	% of Var	Cum %
PP	1.00000	*	1	4.87099	40.6	40.6
UB	1.00000	*	2	3.03761	25.3	65.9
BF	1.00000	*	3	1.45996	12.2	78.1
ESSS	1.00000	*	4	1.34083	11.2	89.2
UNRT	1.00000	*	5	0.59076	4.9	94.2
GR	1.00000	*	6	0.30744	2.6	96.7
MA	1.00000	*	7	0.17116	1.4	98.2
TC	1.00000	*	8	0.09786	0.8	99.0
DB	1.00000	*	9	0.07178	0.6	99.6
CW	1.00000	*	10	0.03937	0.3	99.9
SK	1.00000	*	11	0.01215	0.1	100.0
TR	1.00000	*	12	0.00010	0.0	100.0

tools and retouched flakes, cores and associated lithic debris. The second factor exhibits high loadings on variables associated with hide processing and food preparation; namely, end and side scrapers, ceramic sherds, Traverse ware, and to a lesser extent, lithic debitage. In the third factor, both manos and grinding slabs exhibit high loadings. This factor is interpreted as a food processing activity set. The last factor is composed of projectile points and Skegemog ware. It is interpreted as reflective of a short term, logistically oriented foray to the site by manufacturers of Skegemog ware.

The spatial plot of the factor analysis for Area 2 (Figure 54) is interpreted in the same fashion as it was in the lithic analysis; largely spatially discrete activity areas representing a sexual division of labor with a small amount of overlap. When the spatial locations of the factors are combined with the location of the features in Area 2 (see Appendix 2), it can be seen that the factors cluster around and between Features 7 to 10. Additionally, the area east of Feature 7 appears to be the focus of food processing activities. Such a situation certainly would be expected with domicile oriented or small family group oriented economic units. Although postmolds indicative of a structure are lacking in Area 2, there is a drop off in the density of both the lithic and ceramic artifacts to the west of the feature cluster. This may indicate the presence of a structure in the vicinity. Finally, this series of activity sets is interpreted as the locus of a domestic unit dating to the fourteenth century A.D. based on the radiocarbon date (M-1864) from this part of the site.

The Skegemog factor is very weakly expressed and did not meet the minimal requirements for plotting. However, it is worth noting that Skegemog wares are most prevalent in the northwestern portion of the excavation block.

Analysis of Area 3 artifacts also produced a six factor solution accounting for 81.9% of the cumulative variance (Table 27). As with the other two factor analyses, the spatial plots of the resultant factors are similar, but the constituent member classes

Table 27. Rotated Lithic and Ceramic Factor Solutions: Area 3

Rotated Factor Matrix

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
PP	.61665	.54449	.21054	-.10569	-.02300	.04733
S1	.68541	-.03084	.31846	.23713	.29610	-.30836
S2	-.00027	-.02893	.27013	.10487	.13276	.87557
BF	.10293	-.13045	.53854	.28996	.60093	-.01385
PE	.66100	.45132	.07785	.19716	.04478	-.32325
ES	.35841	.62452	-.26254	-.08724	.22789	.52014
SS	.84681	-.03797	.03467	.06186	-.06684	.27066
UN	.49226	-.13325	-.11635	.16368	.66425	-.04015
RT	.15920	-.04341	.20945	.99732	-.04266	.11221
HM	-.11705	.22950	.01008	-.15800	.83707	.24909
GR	-.02206	.65265	.12525	.50785	-.31969	.09671
TC	.14817	.49396	.00207	.69333	.25798	-.10773
DB	.73031	.22419	.18979	.39663	.21321	-.06232
CW	.45795	.23937	.77187	.04026	.09277	.13116
BO	.11940	.78180	.29355	.08506	.08630	-.07556
SK	.62993	.28496	.49670	-.10569	-.00972	.11324
TR	.07749	.15875	.91556	.21421	-.06996	.13142

Variable	Communality	*	Factor	Eigenvalue	% of Var	Cum %
PP	1.00000	*	1	5.93844	34.9	34.9
S1	1.00000	*	2	1.92607	11.3	46.3
S2	1.00000	*	3	1.79484	10.6	56.8
BF	1.00000	*	4	1.70850	10.0	66.9
PE	1.00000	*	5	1.51293	8.9	75.8
ES	1.00000	*	6	1.04984	6.2	81.9
SS	1.00000	*	7	0.83498	4.9	86.9
UN	1.00000	*	8	0.61418	3.6	90.5
RT	1.00000	*	9	0.44544	2.6	93.1
HM	1.00000	*	10	0.38860	2.3	95.4
GR	1.00000	*	11	0.31766	1.9	97.2
TC	1.00000	*	12	0.15382	0.9	98.1
DB	1.00000	*	13	0.11826	0.7	98.8
CW	1.00000	*	14	0.09705	0.6	99.4
BO	1.00000	*	15	0.06094	0.4	99.8
SK	1.00000	*	16	0.02875	0.2	99.9
TR	1.00000	*	17	0.00971	0.1	100.0

are altered. In Factor 1 projectile points, stage 1 bifaces, pieces esquillees, side scrapers, chert debitage, and Skegemog ware all exhibit high loadings. The artifact classes, and ceramic sherds, and unifacial tools both exhibit moderate loadings on this factor. The second factor is attenuated in its composition, containing only endscrapers, grinding slabs, and Bowerman ware. It may be interpreted as a processing activity set. Factor 3 contains Traverse ware, ceramic sherds, and bifaces along with a moderate loading on Skegemog ware. The remaining three factors are a mixed bag of processing and manufacturing activity sets with retouched flakes, grinding slabs, and cores in Factor 4; unifacial tools and hammers in Factor 5; and stage 2 bifaces and endscrapers in Factor 6.

As in Area 1, the spatial plot of the factor results for Area 3 are heavily overlapping and appear to represent all three of the primary temporal occupations at the site (Figure 55). Although the definition is not clear, there does appear to be a tendency for the plotted factors to be located in the areas of lower densities of postmolds, the possible structures, and the hearths. Furthermore, the composition of the factors suggests that all of the occupations in this area of the site are of shorter duration. In the case of the Traverse phase occupation, this fits well with the above hypotheses about the temporal and geographically attenuated character of some of the ceramic types such as Traverse Decorated, variety Pinched. Given the greater intensity of the Traverse phase occupation in this area of the site as measured by vessel density and the extreme clustering of vessels in the southern portion of the excavation block, it would appear that the structures identified by Cleland (n.d.a.) are associated with the late phase occupation. Furthermore, given the apparent tendency for the plotted factors to occur near to, but outside of potential structures, it is hypothesized that a third structure may have been located in the central portions of the 1966 excavation block in Area 3. Both the Skegemog phase and the Traverse phase occupations in this part of the site can be

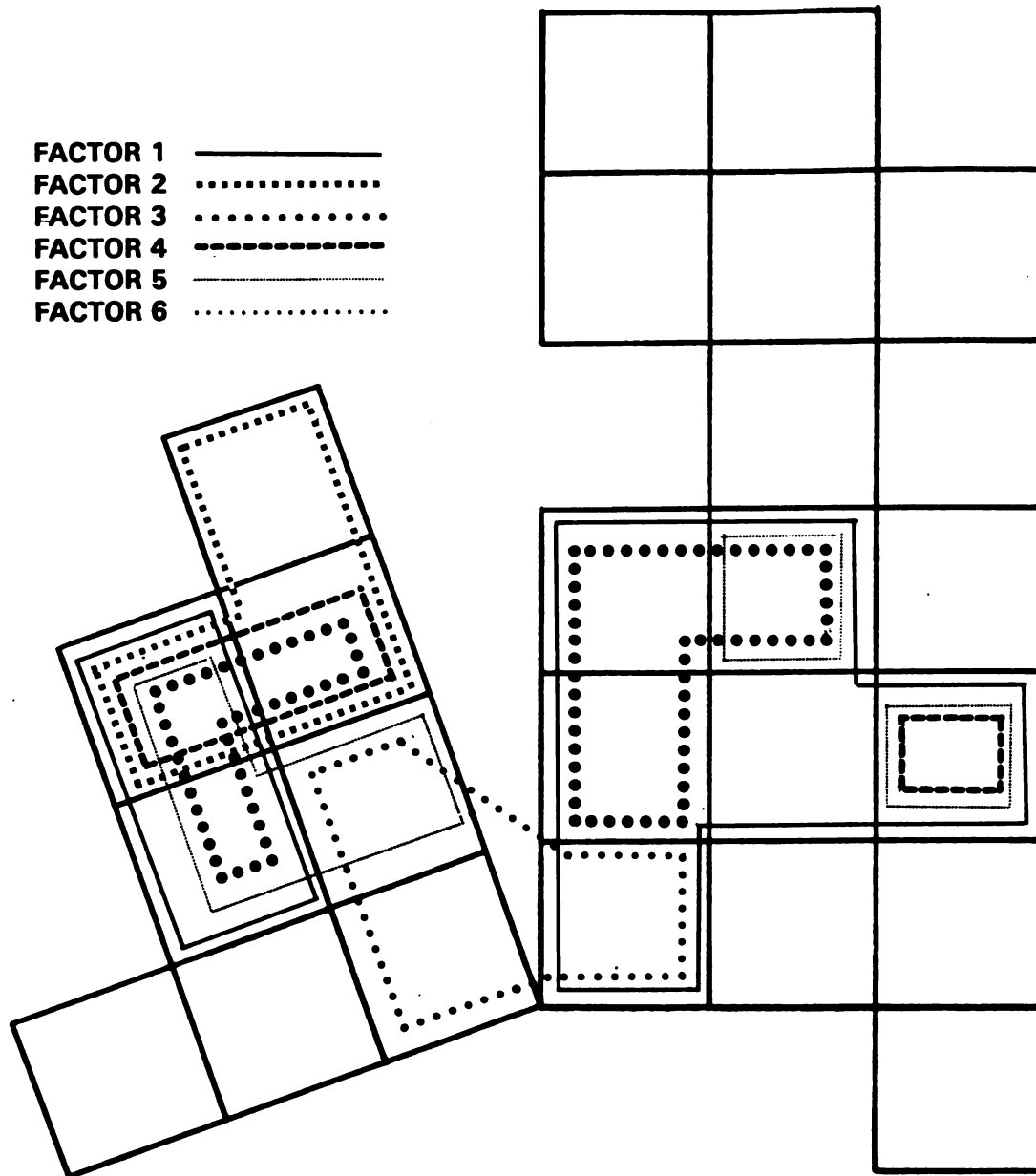


Figure 55. Plotted Ceramic and Lithic Factor Solutions: Area 3

associated with two of the radiocarbon dates from the site. Date M-1863 originating from the twelfth century A.D. would appear to date the later occupation in this part of the site, while the tenth century A.D. date is associated with the early phase occupation in this part of the site.

CONCLUSIONS

Analysis of the lithic and ceramic assemblages recovered from the Skegemog Point site demonstrate that there is changing duration and intensity of occupation through time. Activity sets of varying composition are defined and associated with both specific ceramic sets isolated through cluster analysis, clusters of features and radiocarbon dates. Initial estimations of the activity sets were generated through the employment of chi-square and factor analysis on the lithic assemblage. These activity sets were then refined through the addition of a temporal variable by the inclusion of the ceramic data.

Increase in the intensity and the spatial breadth of the site viewed as suitable for occupation through time is documented. While there does appear to be gross level changes in the number of social groups utilizing the site through time, there does not appear to be significant changes in certain lower level aspects of the fundamental economic unit (i.e., the family unit). Locating, recording, and inventorying domestic structures has long been a part of American archaeology (cf. Ritchie 1932), particularly in areas such as the American southwest (Hill 1966, 1967; Longacre 1964, 1970) and with the New York Iroquois (Ritchie and Funk 1973) where architectural remains are both plentiful, well preserved, and easily identified. It has only been in more recent times, however, that the importance and value of using the household as an organizing feature in intra-site spatial analysis has been realized (Flannery, ed. 1976; Steponaitis 1983). Such an approach has become a standard analytic approach with both Iroquoian (Dodd 1984; Finlayson 1985; Kapches 1990) and Mississippian studies (e.g. Barreis

and Porter, eds. 1984; Conner, ed. 1985). Such an approach has only intermittently been used in the Upper Great Lakes region (Brose 1970; McPherron 1967), in part because architectural remains are notoriously hard to come by in the late prehistoric period of the Upper Great Lakes.

Lovis (1990b), however, has demonstrated the utility of substituting the hearth as a means to organize intra-site spatial analyses when clearly defined architectural remains are lacking. The stratified O'Neil site in Charlevoix County provided an excellent opportunity to test this proposition. Not only does the site contain a series of stratified deposits which allowed separation of the different temporal components at the site, but it also preserved a variety of features including hearths and at least two structures (Lovis 1973:221-239). While there are clearly overlapping activity sets at the O'Neil site represented in the distribution of the artifacts, the distance between individual hearths is greater than at the Skegemog Point site. Using factor analysis as a means to identify, separate and otherwise control for the presence of overlapping activity sets, Lovis (1990b) was able to discern and separate occupations by several different groups and draw inferences concerning the structure of their use at the O'Neil site.

Throughout the entire occupational history of the Skegemog Point site, the hearth area appears to be a focal point around which different activities and sets of activities were organized. But there is not a direct correspondence between the occurrence of an activity set(s) and the structure of the social group responsible for its creation (cf. Schiffer 1976, 1982). It is at this level that the specific composition of the artifact classes composing the activity set(s) in terms of the types represented and their relative frequencies, as well as taphanomic factors impinging on them, come into play. This, in turn, is reflective of and a function of the place of a particular site within a broader settlement and subsistence hierarchy such as Binford's (1980) logistic/residential dichotomy.

Interpretation of the plotted factors for the three main excavation blocks at the Skegemog Point site indicate that usage of the site can be characterized as both logistically and residentially oriented. Both types of settlement are represented during both the Traverse and Skegemog occupations of the site. Usage of the site by Bowerman populations appears to be primarily logistic in character.

To briefly reiterate, although the definition of temporally meaningful activity sets is not clear in Area 1, the fact that the factors divide into separate "activity sets" representative of hunting and butchering, tool manufacturing activities, fabrication, hide processing, and food processing activities coupled with the predominance of Skegemog ware is suggestive of this area functioning as a residential locale. When this is coupled with the faunal evidence reported by Cleland (n.d.a.), this contention becomes a bit more compelling. Specifically, analysis of the fish scales from the site (Cleland n.d.a.) indicates that every warm season month is represented. Additionally, other fauna distinctive of warm season exploitation also occurs in this area of the site in the form of turtles and a variety of birds. On the other hand, the results of the factor analysis for Areas 2 and 3 suggest that the early Late Woodland occupations here are more specifically associated with hunting activities alone.

During the Traverse phase, a good candidate for a residential locale is found in Area 2. Here the overlapping activity sets have been interpreted as representing activity sets which are usually associated with a sexual division of labor. This, in turn, is used to argue that the occupation in Area 2 represents an archaeological example of a domestic mode of production (Sahlins 1972), which has been described as forming the basic cooperative economic unit in lesser complex social systems. Further evidence for a residential emphasis in the occupation of the Skegemog Point site during the Traverse phase can be found in the occurrence of deep storage or cache pits at the site. Candidates for the presence of a logistic use of the site by Traverse phase populations comes primarily in the form of areas of the site which show low densities of ceramics

and somewhat attenuated variability of the stone tools associated with them. Again, Area 1 may be a potential example of this situation.

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**THE SKEGEMOG POINT SITE: CONTINUING STUDIES IN THE CULTURAL
DYNAMICS OF THE CAROLINIAN-CANADIAN TRANSITION ZONE**

Volume II

By

Michael Jay Hambacher

A DISSERTATION

**Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of**

DOCTOR OF PHILOSOPHY

Department of Anthropology

1992

CHAPTER 5

REGIONAL CONSIDERATIONS

INTRODUCTION

This chapter explores the structure and location of cultural boundaries in the Carolinian-Canadian transition zone of western Michigan during the Late Woodland period. The general questions addressed here were first posed 25 years ago with the initiation of the "edge area" projects (Cleland 1966b, 1967a, 1967b; Fitting 1966a; Flanders 1965). These were among the first projects designed to systematically investigate the cultural adaptations to the major environmental zones present in Michigan. Since the general adaptive patterns in the major biotic provinces were already recognized, the Carolinian-Canadian transition zone served as a unifying theme around which this research revolved. The fundamental question as to the nature of the cultural adaptations in this ecologically transitional area are still relevant to this day.

Over the years, a wide variety of information has been used to investigate the adaptive patterns and the nature of the interrelationships among Upper Great Lakes cultural systems. To this end, Wilkinson (1971) used human skeletal remains to investigate the biological relationships in the Great Lakes region. The distribution of different chert types and finished artifacts has been used to examine Late Woodland interaction patterns in lower Michigan (Luedtke 1976). More recently, Clarke (1991) used neutron activation analysis of ceramic clays and their distributions as a means to understand patterns of differential access to native copper sources in the Lake Superior basin. Wright (1967) used ethnohistoric information to develop a model for exchange networks across the region. Fitting and Cleland (1969) also used ethnohistoric data to

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develop a series of three technic ecotypes or adaptive patterns to help understand prehistoric population distributions and cultural adaptations in the Upper Great Lakes. Finally, the distribution of ceramic decorative designs and design elements have also been used as a means to examine cultural boundaries and interaction patterns in the region (Brashler 1978, 1981; Lovis 1973; McHale-Milner, personal communication 1990).

Of the types of archaeological data employed, it is this latter category which has been favored over the years. This results from a number of factors. First, ceramics are an excellent vehicle for stylistic messaging because of the malleable nature of the raw material. Ceramic vessels also appear to have been replaced at frequent intervals, allowing flexibility in the types of stylistic messages encoded on them. Third, ceramics are a relatively abundant and easily recoverable artifact type, particularly for the Late Woodland period. Finally, and perhaps most importantly, most of the theoretical advances in the use of style to understand cultural processes have come through the examination of ceramic decorative styles.

As discussed in Chapter 2, several advances have recently been made in the way style is viewed, effectively making style a much more powerful analytic tool. This advance lay in the recognition that style is a dynamic and multi-dimensional phenomenon (Wobst 1977) as well as the melding of the interactionist and information exchange theoretical schools (Carr 1985a; Voss 1982; Voss and Young 1989; Wiessner 1983, 1984). Under this view style is considered to be behaviorally based with the individual person or "self" serving as the focal point of expressive behavior. That is, stylistic behavior is part of the ongoing process of re-creation of the self and as such it is contingent on a number of social factors (Voss and Young 1989).

Central to this theoretical perspective is the idea that the components which form the behavioral basis of style have complex links and work in an interactive fashion. The underlying behavioral processes operate in a hierarchical fashion in

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relation to a series of constraining reference hierarchies (e.g., aspects of technology and manufacturing, the sequence of design execution, attribute visibility, design norms, and idiosyncratic variability). At any level in the hierarchy there are a number of factors which can enter into the process, creating a level of indeterminacy in the assignment of social meaning (Carr 1985b; Carr and Rosenthal 1986). Thus, stylistic variation is viewed here as a process of constrained indeterminacy.

THE PROBLEM AND EXPECTATIONS

The central hypothesis of this study relates to the nature of the cultural adaptations in the Carolinian-Canadian transition zone of west central Michigan. Specifically, it is asked whether a permanent resident population was present in the Carolinian-Canadian transition zone during the Late Woodland period. If this is the case, it is expected that a degree of stylistic homogeneity will be present among the ceramic samples from the area. The distribution of this stylistic homogeneity should also have a geographic dimension to it. Further, the range and kind of variability represented among the ceramic sets should be sufficient to distinguish them from the ceramic sets associated with the adjacent biotic provinces (i.e., Mackinaw, Juntunen, Allegan, Spring Creek, and Moccasin Bluff wares).

The converse of this proposition is that there was not a resident population in the region. Under this hypothesis, the transition zone would have formed an area of shared territory used for only a portion of the annual economic rounds by the cultural groups located to the north and south. In this situation, a degree of stylistic heterogeneity is expected since

it would be derived from a number of different and distinctive ceramic wares. A similar geographic distribution of design elements to that seen in the Traverse Corridor (Lovis 1973) would also be expected, but not necessary. This allows for the possibility that certain groups held territorial prerogatives to specific, non-overlapping segments of

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the transition zone. This would result in discrete distributions of ceramic wares in the region.

The Skegemog Point site, located at the junction of the main body of the transition zone and the Traverse Corridor, is a crucial reference point for an examination of the region. As discussed elsewhere in this study, the Skegemog Point site is the only large site in the region which has been extensively excavated. These excavations produced a large, stylistically diverse and temporally broad sample of ceramics. This ceramic sample provides the basis for defining the range and structure of stylistic variability in the region for the Late Woodland period (see Chapter 3). Further, consideration of the ceramics in conjunction with the other artifact classes (primarily lithics) and features at the site provides an indication of the technologic organization of the groups inhabiting the area (see Chapter 4). In many respects, the Skegemog Point site fills the same analytic role for the transition zone as the Juntunen site for the Canadian biotic province and the Moccasin Bluff site for the western portion of the Carolinian biotic province.

General expectations for the structure of the cultural dynamics in the western portion of the Carolinian-Canadian transition zone are provided by several previous studies. These have been detailed in Chapter 1 and are only briefly reiterated here. The pertinent studies are those conducted by Fitting and Cleland (1969), Lovis (1973), Brashler (1981), and to lesser extent, Luedtke (1976). Additionally, a recent paper by Cleland (1990) provides a series of hypotheses regarding the actual structure and location of group boundaries in the Northern Great Lakes and, specifically, west central Michigan.

Drawing on the historic adaptations in the region, Fitting and Cleland (1969) developed a series of adaptive patterns or technic ecotypes for each of the major environmental zones. These adaptive patterns were then projected back through time as a means to understand the archaeological record. The Ottawa provided the adaptive

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model for the Carolinian-Canadian transition zone (Fitting and Cleland 1969). This pattern is characterized by a mixed economy and a flexible social organization. Although agricultural products form an important part of the subsistence base, hunting, fishing and gathering activities are not completely subordinated. This results from the fact that the region lies near the northern periphery of effective corn agriculture (Yarnell 1964). Thus, a degree of uncertainty in the reliability of corn agriculture was present.

Large, semi-permanent, horticultural villages form the core of the settlement system of the Ottawa pattern (Fitting and Cleland 1969:298). During the summer, small groups of mixed sexual composition would hunt and fish away from the village. These efforts would be represented by small residential encampments in the coastal region such as the Point Arcadia site (Hambacher 1988). Summer was also the primary season for trading expeditions. The other primary site types in this settlement system are dispersed winter hunting camps and residences. These were generally located in the interior river drainage and lake systems.

Ottawa society has been described as a network of extended families and larger kin groups organized around common interests in production, trade, and warfare (McClurken 1986, 1988). These groups were, in turn, assembled into a series of localized residential groups. The fundamental socio-political unit among the Ottawa is the extended family (McClurken 1988:28). The size and composition of the aggregate group varied seasonally between the large villages and the dispersed cold season encampments and residences. By de-emphasizing aspects of unilineal descent groups, highly structured marriage and post-marital residence patterns, and more highly formalized sodalities, a large degree of social and economic flexibility was built into the system (McClurken 1988). Such systems are ideally suited for dealing with the structure of the resource base present within the Carolinian-Canadian transition zone.

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Subsistence-related information from sites in west central Michigan is extremely limited so it is not possible to reconstruct this aspect of the Late Woodland societies in the study region. The limited information which is available from Skegemog Point (Cleland n.d.a.) and the Point Arcadia site (Hambacher 1988) does not contradict the hypothesized mixed horticultural, hunting, fishing, and collecting economy exemplified by the Ottawa. Similar problems are present with identification of the organization of Late Woodland societies in the region. The pattern of hearth centered activity sets identified at the Skegemog Point site, however, is commensurate with that of an egalitarian based society emphasizing a basically domestic mode of production (see Chapter 4). Further support for this comes from the Point Arcadia site which has been interpreted as a small, warm season residential locale on the basis of the size and composition of the artifact assemblage from the site (Hambacher 1988).

North of the Skegemog Point site, the nature of cultural boundaries and interaction patterns in the Traverse Corridor have been studied by Lovis (1973). This study demonstrated that there was not a distinctive style pool associated with the Traverse Corridor. Three geographic avenues, the Straits of Mackinac, the Inland Waterway and the southern end of Grand Traverse Bay, were identified for the sources of stylistic input into the region (Lovis 1973:287-320). Although some decorative attributes were shared across the region, enough differences remained to differentiate the different ceramic wares. Thus, the Traverse Corridor may be appropriately viewed as a shared environment

in which the cultural groups using it maintained their own identity. While interaction between the groups most certainly took place, the nature or structure of these interactions necessitated maintenance and/or signaling of cultural affiliation.

Important to this study is the identification of the southern end of Grand Traverse Bay as a source of stylistic input to the Traverse Corridor. This implies the presence of a permanent resident identity-signaling social group in that area. An initial

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suggestion of this was provided by a test of association between spatial proximity and stylistic proximity (Lovis 1973:299-300). Although the relationship was not strong, Skegemog Point and Fauver did exhibit the highest phi coefficient of the site pairs investigated. The geographic extent of this identity-signaling group, the structure of the cultural boundaries, and interaction patterns to the south were unclear at that time.

Seemingly contradictory conclusions to this proposition were reached by Luedtke (1976:401-402). From the distribution of chert raw materials and an ad hoc consideration of the distribution of ceramic wares, it was argued that the patterns exhibited in the Traverse Corridor also held for the rest of the Carolinian-Canadian transition zone. The problems associated with this conclusion, at least in the western part of the transition zone, have been discussed in Chapter 1. These conclusions, however, are not totally dismissed since they may provide evidence for either the presence of multiple groups in the transition zone or several different types of usages of the region.

The final expectation for the analysis is derived from the study of early Late Woodland social dynamics by Brashler (1981). The importance of this study's contribution to the understanding the ranges and kinds of design variability present in the Carolinian biotic province are obvious. Equally important, however, is that specific conclusions were drawn regarding the scale and kind of differences which are sufficient to identify a distinct identity-signaling group, at least during the early Late Woodland period. Thus, it is expected that separation of different ceramic wares will most likely occur in terms of shifts in the relative frequencies of design attributes and attribute combinations. Abrupt stylistic breaks are not expected. Whether these expectations hold for the late phase of the Late Woodland period is also unclear.

Specific hypotheses for the location, structure, and strength of social/cultural boundaries in the Upper Great Lakes, including the west central part of the lower peninsula, have been put forward by Cleland (1990). Using ethnohistoric data from the

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early 19th century, it was argued that valuable clues to the structure of the prehistoric cultural systems in the Upper Great Lakes can be attained. Central to this proposition are the notions that both historic and prehistoric territories were conditioned by the same ecological and economic constraints and that similar social and political organizational structures were present (Cleland 1990:3). This model emphasizes continuity in many of the organizational principles of Ottawa and Ojibwa society, while acknowledging the impact of contact with Euro-American societies.

The applicability of the reconstructed band territories to the pre-contact era relies on three primary assumptions (Cleland 1990:3-6). First, it is argued that the general demographics and population dynamics are similar between the two periods. It follows that the resource and subsistence requirements would also be comparable. Similar structures to the subsistence systems and the territorial requirements to fulfill resource needs are also assumed (Cleland 1990:5-6). The current status of the knowledge regarding Late Woodland cultural dynamics lends credence to the validity of these assumptions.

Under this model, group boundaries are viewed as impermanent, serving to circumscribe the resources collectively used annually by a social group (Cleland 1990). Thus, the size and limits of territories are only as stable as the social groups habitually using them. Importantly, while specific group composition, and hence, territories, are seen to be primarily a function of sociological factors, correspondence with physiographic features is also noted (Cleland 1990:13, Figure 1). Typically, territories were found to be organized around river systems. These provided access not only to the coastal resources and transportation routes, but also to interior resource locales. The placement of sites within the territory is a reflection of the structure of the resources within it (Cleland 1990:14). At least one large site representing the maximal aggregation of the band is expected for each territory. A number of smaller sites

representing the residential and logistic movements of individual families or small groups of families are also expected.

In western Michigan a number of band and sub-band territories were identified for the Ottawa during the period between 1820 and 1852 (Cleland 1990:Figure 1). Two major band territories are indicated. The northern territory extends from the approximate center of the Traverse Corridor southward to the general region between the Betsie and Manistee River drainages. A sub-band boundary extending across the southern end of Grand Traverse Bay is also present. The southern band territory mapped by Cleland (1990:Map 1) continues southward to include the Muskegon River Valley, which also corresponds with the southern limits of the transition zone. Four sub-band territories are indicated in this southern band territory, each of which roughly correspond to the Manistee, Pere Marquette, White, and Muskegon Valleys. These territories provide a hypothetical framework within which the distribution of Late Woodland ceramic decorative attributes can be considered.

In sum, in addition to the ceramic samples examined here, the investigation of the presence and nature of cultural boundaries in the Carolinian-Canadian transition zone relies on a number of other studies. Expectations for the general structure of the adaptive pattern of a resident population is outlined by Fitting and Cleland (1969). Lovis (1973) provides initial indications for a resident population in the region. The range and kinds of differences among identity-signaling groups as expressed in ceramic decorative designs which may be expected in the region is provided by Lovis (1973) and Brashler (1981). Luedtke (1976) provides ancillary evidence for the nature of the Late Woodland use of the transition zone. Expectations for the specific distribution of group territories and the types of physiographic features to which they correspond is provided by Cleland (1990). Finally, Voss and Young (1989) provide the theoretical

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framework within which the similarities and differences encountered in this study can be evaluated and interpreted.

ANALYTIC METHOD

From the outset of this analysis it was expected that a number of analytic problems would present themselves. The number of sites available for analysis is limited and the sizes of the analytically usable ceramic samples vary widely. Further, a problem of precise temporal control is also present. This is a result of variable site size, function, and amount of investigation carried out at each site. Thus, it was expected that it would only be possible to identify general patterns or trends in the distribution of ceramic design elements across the region.

Because of these factors, it was decided to continue to use cluster analysis as the analytic method of choice for this stage of the investigation. Squared Euclidean distance was once again used as the measure of similarity and Ward's method was used as the preferred clustering algorithm. The manner in which this variety of cluster analysis functions has already been discussed in Chapter 3 and need not be repeated here. It was felt that, given the highly variable sample sizes involved, it would be best to focus on the placement or comparison of specific vessels against the ceramic typology from the Skegemog Point site. Also, as will be discussed below, the sites used in this stage of the analysis tend to cluster in several different parts of the study region. As such, the sites utilized in this analysis almost function in the fashion of "non-site" sampling (Thomas 1975). Thus, the level at which individual vessels or groups of vessels from a particular site join the clusters of Skegemog Point vessels coupled with the geographic distance of that site is interpreted as an indicator of the relative degree of stylistic distance between the two samples. Additionally, this process allows for something other than a gestalt classification of the ceramics from the comparative sites. That is, if the specimens did not conform closely to the current ceramic classification from the

Skegemog Point site, they would not be forced into classificatory units to which they might not actually belong.

The ceramic vessels from the comparative ceramics were initially sorted by general temporal affiliation (i.e., early versus late Late Woodland). The primary reference populations for these two phases are Skegemog and Traverse wares, respectively. Bowerman ware was not formally included in this stage of the analysis. During the coding of the ceramics from the comparative collections, very few vessels which could be considered examples of Bowerman ware were encountered. Thus, while the sample size of Bowerman ware from the Skegemog Point site was sufficient, it was not felt that there was an adequate sample of comparative vessels. Formal comparison of Bowerman ware and its closest typological counterpart, Allegan ware, was beyond the scope of this study. Further, the interrelationships between Bowerman and Skegemog wares is unclear at this time. Finally, it was felt that if any of the ceramics from the early phase comparative samples were more closely related to Bowerman/Allegan wares, it would be reflected in the structure of the dendrograms.

The attribute lists employed in the cluster analysis of the comparative sites follow that used for the analysis of Skegemog ware (Table 3) and Traverse ware (Table 4). Thus a total of 51 attributes were coded for the early Late Woodland ceramics and 52 attributes were coded for the late Late Woodland ceramics. A greater degree of variability in the number of individual attribute states used for each phase is present. Once again, purely stylistic attributes were emphasized. Technological characteristics such as paste and temper composition were de-emphasized and treated in a post hoc fashion.

COMPARATIVE COLLECTIONS

The degree to which the questions asked in this study can be tested and evaluated is directly tied to the size as well as the geographic and temporal distribution

of the comparative collections employed. Unfortunately, the number of Late Woodland sites located within the study area with usable ceramic populations is limited. The fairly large number of prehistoric sites listed for the counties of west central Michigan in the State archaeological site files is somewhat deceiving. The vast majority of these sites consist of isolated find spots, non-diagnostic debitage and fire-cracked rock scatters, literature references; these sites also often date to pre-Late Woodland periods. Further, many of the sites which do date to the late Woodland period either totally lack ceramics or the ceramic samples are too fragmentary to be of use in this study.

As a result of the above conditions of the archaeological data base for the west central lower peninsula of Michigan, only a relatively small number of sites are suitable for this stage of the analysis. To keep the number of usable sites as high as possible, as a rule of thumb, a minimum of three vessels were needed for the site to be included. This was actually more a desired minimum rather than an absolute minimum. In several instances the minimum number of vessels required was relaxed. These decisions were usually based on vessels which displayed unambiguous typological affiliations. Although small in number, the contribution of these sites to the represented design variability in different parts of the study area was felt to be important. The locations of the sites used in the regional analysis are presented in Figure 1. The size of the comparative samples from each of the collections and their assigned temporal affiliation are discussed below.

Collections from a total of 31 sites and collection locales were used in the regional analysis. As can be seen in Figure 1, most of these are located along or near the Lake Michigan coast. Sites located in the interior of the state are limited to the Aetna I and II and Boven earthworks in Missaukee County; the Arnold Lake and Cranberry Lake sites, and Hayes Township Hall site near Harrison, Michigan; and 20GR91 in Alma, Michigan. Ceramic samples from these sites are restricted to the late phase of the Late Woodland period. Along the coast, a cluster of sites occurs around

the Manistee Valley. South of the Manistee Valley, the distribution of comparative collections is dispersed. A brief description of each of the sites and the collections used in this stage of the analysis is presented in Appendix 4.

RESULTS

This section examines the structure of the dendrograms generated for the two temporal subdivisions of the Late Woodland period. An emphasis is placed on examining two primary aspects of the assemblages under study. First, the sequence and level at which vessels from the comparative collections cluster with the vessels from the Skegemog Point site are considered. Relative attribute frequencies among the sites are also examined. Because of the highly variable sample sizes among the comparative collections and the large size of the sample from Skegemog Point, caution had to be exercised in interpreting attribute frequencies. This aspect was particularly de-emphasized in the smaller samples. Conclusions regarding the amount and kind of stylistic differences among the various sites and its implications for aspects of cultural boundary maintenance are then drawn.

Examination of the dendrograms generated during the second set of cluster analyses (Figures 56 and 57) revealed several general patterns. First, the sequence of cluster formation and the composition of the clusters were not significantly altered by the inclusion of the comparative samples. This is considered an indication that large additions in the amount and kind of stylistic variability does not occur in the region south of Grand Traverse Bay. That is, overall, there is a degree of similarity between the ceramics from the Skegemog Point site and the sites lying to the south. Second, it is also apparent that groups of vessels from a single site or, more typically, from a number of sites, agglomerate into mini-clusters before merging with groups of vessels from Skegemog Point. This is interpreted as an indication that despite the general

Figure 56. Early Late Woodland Dendrogram

Key:

1. Skegemog Point (n=1, Cluster 1), Point Arcadia (n=1), McGlynn (n=8), Magoon Creek (n=1), Airport 3 (n=3), Porter Creek (n=3)
2. Skegemog Point (n=5, Cluster 1), McGlynn (n=4), Airport 3 (n=1), Porter Creek (n=2)
3. Skegemog Point (n=2, Cluster 1), Point Arcadia (n=1), McGlynn (n=2), Magoon Creek (n=1), Airport 3 (n=1), Porter Creek (n=3), Juniper Beach (n=1)
4. Skegemog Point (n=5, Cluster 1), Santer (n=1), McGlynn (n=1), Ursum Collection (n=1), Porter Creek (n=4), Sheridan Township (n=1), Juniper Beach (n=1)
5. Skegemog Point (n=1, Cluster 1), Santer (n=1), Point Arcadia (n=2), McGlynn (n=5), Ursum Collection (n=3), Airport 3 (n=3), Porter Creek (n=4), Juniper Beach (n=1)
6. Skegemog Point (n=7, Cluster 4), Santer (n=1), Point Arcadia (n=1), McGlynn (n=1), Airport 3 (n=3), Porter Creek (n=2), Juniper Beach (n=1)
7. Skegemog Point (n=1, Cluster 1; n=6, Cluster 2; n=1, Cluster 4), Point Arcadia (n=1), McGlynn (n=4), Magoon Creek (n=2), Porter Creek (n=4), Juniper Beach (n=2)
8. Skegemog Point (n=7, Cluster 4), Porter Creek (n=1)
9. Skegemog Point (n=3, Cluster 3; n=2, Cluster 4), Airport 3 (n=1), Porter Creek (n=1), Sheridan Township (n=1)
10. Skegemog Point (n=7, Cluster 3; n=1; Cluster 4)
11. Skegemog Point (N=3, Cluster 3), Point Arcadia (n=4), Magoon Creek (n=1)
12. Skegemog Point (n=4, Cluster 2; n=5, Cluster 3), McGlynn (n=1), Ursum Collection (n=1)
13. Skegemog Point (n=2, Cluster 8), Point Arcadia (n=3), McGlynn (n=4), Magoon Creek (n=2), Porter Creek (n=5), Juniper Beach (n=1)
14. Skegemog Point (n=5, Cluster 8), McGlynn (n=3), Porter Creek (n=1), Juniper Beach (n=1)
15. Skegemog Point (n=5, Cluster 8), McGlynn (n=3), Porter Creek (n=1), Ursum Collection (n=1)
16. Skegemog Point (n=4, Cluster 8), Porter Creek (n=1)
17. Skegemog Point (n=2, Cluster 8), Santer (n=4), Point Arcadia (n=1), Porter Creek (n=2)
18. Skegemog Point (n=6, Cluster 6)

Figure 56 (cont'd).

19. Skegemog Point (n=5, Cluster 6)
20. Skegemog Point (n=1, Cluster 3; n=2, Cluster 10)
21. Skegemog Point (n=5, Cluster 6; n=1, Cluster 7)
22. Skegemog Point (n=3, Cluster 7)
23. Skegemog Point (n=7, Cluster 7), Santer (n=1)
24. Skegemog Point (n=4, Cluster 7; n=1, Cluster 8; n=2, Cluster 10), McGlynn (n=1)
25. Skegemog Point (n=6, Cluster 7; n=1, Cluster 9)
26. Skegemog Point (n=1, Cluster 6; n=5, Cluster 7)
27. Skegemog Point (n=3, Cluster 7)
28. Skegemog Point (n=2, Cluster 5)
29. Skegemog Point (n=5, Cluster 5)
30. Skegemog Point (n=6, Cluster 5)
31. Skegemog Point (n=9, Cluster 8)
32. Skegemog Point (n=6, Cluster 8), Santer (n=1), McGlynn (n=1), Ursum Collection (n=1)
33. Skegemog Point (n=13, Cluster 9), McGlynn (n=1)
34. Skegemog Point (n=3, Cluster 10), McGlynn (n=2)
35. Skegemog Point (n=1, Cluster 5; n=1, Cluster 7; n=2, Cluster 9; n=1, Cluster 10), Airport 3 (n=1), Juniper Beach (n=1)
36. Skegemog Point (n=4, Cluster 7; n=3, Cluster 8; n=2, Cluster 9), McGlynn (n=1), Porter Creek (n=1)

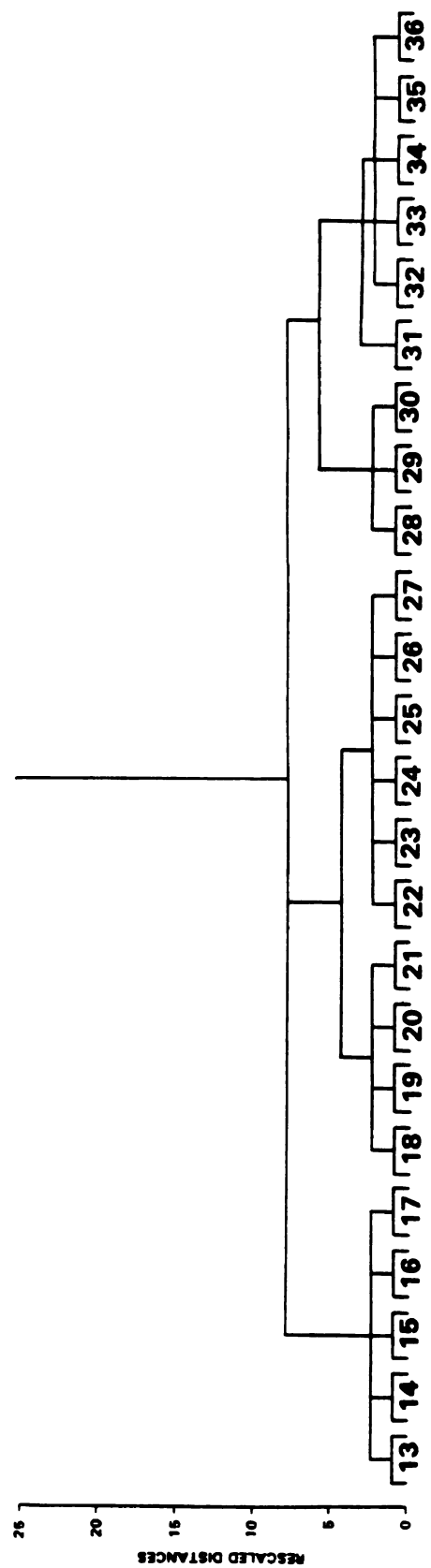
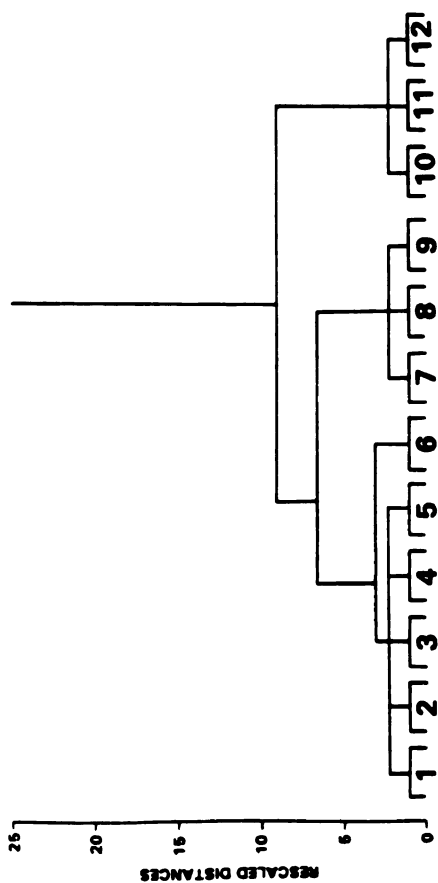


Figure 56 (cont'd).

Figure 57. Late Late Woodland Dendrogram

Key:

1. Skegemog Point (n=26, Cluster 1)
2. Henderson Lamb (n=1), Point Arcadia (n=1), Airport 3 (n=1), Quick (n=2), Harrison Area (n=2), Silver Lake (n=2), Dumaw Creek (n=5), 20GR91 (n=1)
3. Skegemog Point (n=5, Cluster 1; n=1, Cluster 2), Henderson Lamb (n=1), Schuler (n=3), Point Arcadia (n=10), Burnham (n=1), Airport 3 (n=1), Porter Creek (n=1), Bear Swamp (n=1), Harrison Area (n=1), Silver Lake (n=3), Dumaw Creek (n=9), Little Pebawma Village (n=1), 20GR91 (n=3)
4. Aetna II (n=2), Point Arcadia (n=1), McGlynn (n=2), Dumaw Creek (n=2), 20GR91 (n=6)
5. Skegemog Point (n=11, Cluster 1; n=5, Cluster 3), Schuler (n=5), Aetna II (n=1), Point Arcadia (n=4), Dumaw Creek (n=2)
6. Skegemog Point (n=4, Cluster 2; n=12, Cluster 3), Henderson Lamb (n=2), Harrison Area (n=1)
7. Skegemog Point (n=14, Cluster 2), Point Arcadia (n=3), Burnham (n=1), Bear Swamp (n=1), Harrison Area (n=2), Silver Lake (n=1), 20GR91 (n=1)
8. Skegemog Point (n=11, Cluster 2), Henderson Lamb (n=1), Point Arcadia (n=5), McGlynn (n=1), Quick (n=1), Harrison Area (n=7), 20GR91 (n=1)
9. Skegemog Point (n=1, Cluster 2; n=10, Cluster 4; n=1, Cluster 9), Point Arcadia (n=5), Dumaw Creek (n=5)
10. Skegemog Point (n=7, Cluster 8; n=3, Cluster 9), Henderson Lamb (n=1), Aetna I (n=1), Point Arcadia (n=3), Ursum Collection (n=1), Dumaw Creek (n=1), Little Pebawma Village (n=1)
11. Skegemog Point (n=9, Cluster 6; n=13, Cluster 7; N=3, Cluster 9), Harrison Area (n=1)
12. Skegemog Point (n=10, Cluster 5), Point Arcadia (n=3)
13. Skegemog Point (n=5, Cluster 9), Schuler (n=2), Aetna I (n=1), Point Arcadia (n=1), Harrison Area (n=1) Dumaw Creek (n=12), Little Pebawma Village (n=2)
14. Skegemog Point (n=4, Cluster 6; n=12, Cluster 9), Henderson Lamb (n=3), Schuler (n=1), Aetna I (n=3), Aetna II (n=3), Point Arcadia (n=5), McGlynn (n=1), Fifth Avenue Beach (n=1), Quick (n=2), Harrison Area (n=5), Dumaw Creek (n=3), Little Pebawma Village (n=1), 20GR91 (n=4)

Figure 57 (cont'd).

15. Skegemog Point (n=10, Cluster 10; n=2, Cluster 12)
16. Skegemog Point (n=3, Cluster 10), Schuler (n=1), Ursum Collection (n=1)
17. Skegemog Point (n=10, Cluster 12), Henderson Lamb (n=1), Aetna II (n=1), Harrison Area (n=1), Dumaw Creek (n=1)
18. Skegemog Point (n=8, Cluster 11)
19. Skegemog Point (n=2, Cluster 11; n=15, Cluster 12), Dumaw Creek (n=1)
20. Skegemog Point (n=9, Cluster 17), Aetna I (n=2), Harrison Area (n=2), 20GR91 (n=1)
21. Skegemog Point (n=4, Cluster 18)
22. Skegemog Point (n=4, Cluster 18)
23. Skegemog Point (n=2, Cluster 17; n=4, Cluster 18), Aetna I (n=1), 20GR91 (n=2)
24. Skegemog Point (n=1, Cluster 9; n=1, Cluster 11; n=12 Cluster 16), Henderson Lamb (n=1), 20GR91 (n=2)
25. Skegemog Point (n=1, Cluster 4; n=1, Cluster 5; n=2, Cluster 3), Harrison Area (n=5)
26. Aetna I (n=1), Aetna II (n=3), Henderson Lamb (n=8), Schuler (n=1), Point Arcadia (n=4), Harrison Area (n=4)
27. Skegemog Point (n=4, Cluster 15), Aetna I (n=3), Aetna II (n=1), Point Arcadia (n=6), Airport 3 (n=1), Silver Lake (n=1), 20GR91 (n=1)
28. Skegemog Point (n=7, Cluster 15), Point Arcadia (n=2), Ursum Collection (n=1)
29. Skegemog Point (n=5, Cluster 15; n=6, Cluster 16), Henderson Lamb (n=2), Aetna I (n=1), Aetna II (n=1), Fifth Avenue Beach (n=1), Point Arcadia (n=1), Quick (n=1), Harrison Area (n=2), Dumaw Creek (n=1)
30. Skegemog Point (n=10, Cluster 16)
31. Skegemog Point (n=14, Cluster 13)
32. Skegemog Point (n=1, Cluster 13; n=7, Cluster 14), Aetna I (n=3), Point Arcadia (n=5), Sheridan Township (n=1), Harrison Area (n=4)

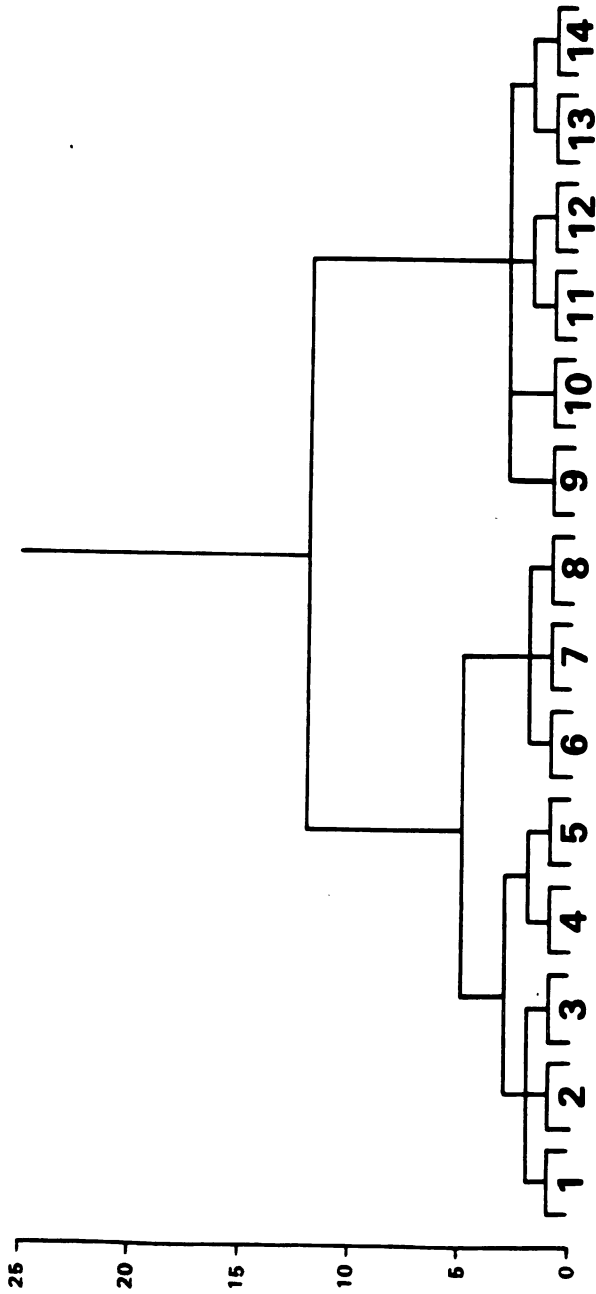


Figure 57 (cont'd).

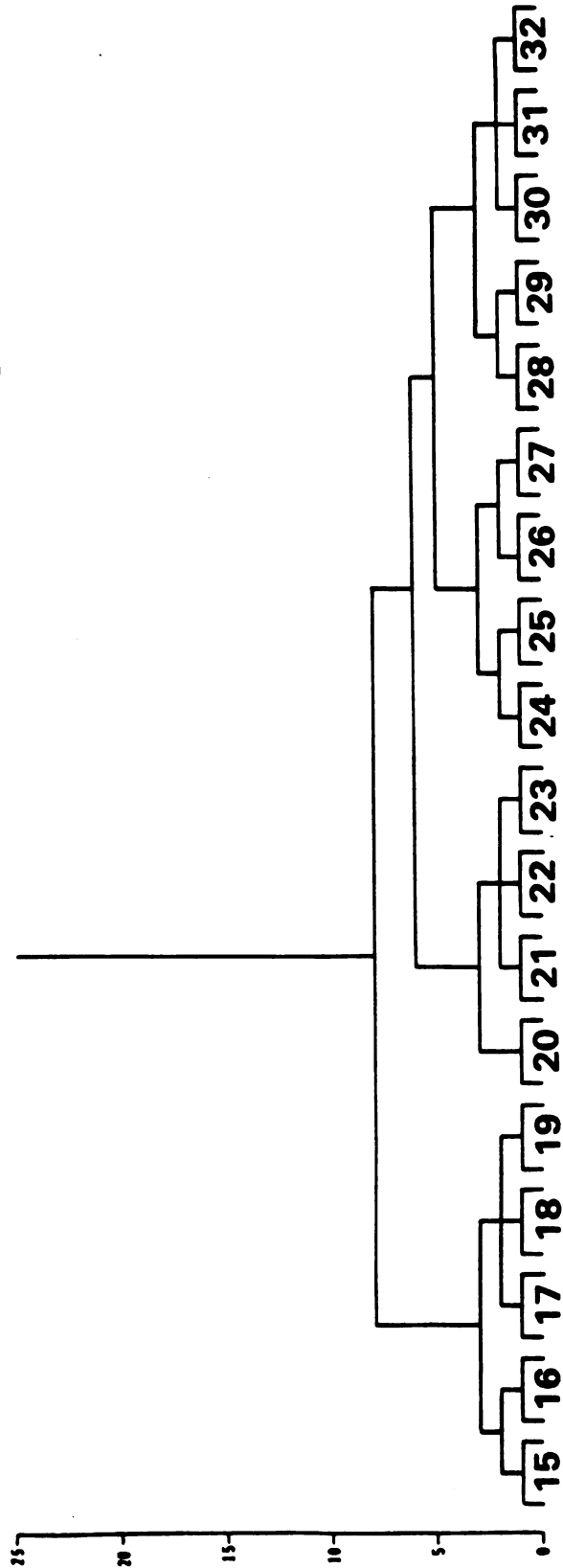


Figure 57 (cont'd).

similarity between the ceramic sets, there are significant differences between Skegemog Point ceramics and the ceramics from sites in west central Michigan. This feature corresponds well with Brashler's (1981) conclusion that it is through attribute frequency differences that different ceramic wares are differentiated from one another.

One-hundred thirty-three vessels from nine sites were used in the regional analysis for the early Late Woodland period. The sample of Skegemog phase vessels from the Skegemog Point site included 198 vessels. The comparative sites for this period include the Santer, Point Arcadia, McGlynn, Magoon Creek, Porter Creek South, and Juniper Beach sites. Several isolated finds from the west end of Lake Manistee (Ursum collection) and northeastern Mason County (Greene collection) were also included. As can be seen in Figure 1, these sites largely cluster in the lower reaches of the Manistee Valley. The ability to discern patterns south of this region is severely limited by the lack of reference points. In a sense then, this stage of the analysis becomes a test of whether the Skegemog Point and Manistee Valley sites share a common style pool. As noted above, Cleland (1990:Map 1) hypothesizes the presence of a band level boundary between these two regions.

Minor changes occurred in the clustering of the Skegemog ware vessels when the other sites were added to the equation. These changes primarily consist of minor shifts in the sequencing of the individual vessels. All of the shifts occur at levels below that used to designate sub-varieties in the dendrogram. Thus, these low order changes are considered to be insignificant in terms of the general patterns sought by this analysis.

The most striking aspect of the early Late Woodland dendrogram (Figure 56) is the amount of decoration present in the vessels from the Skegemog Point site compared to, that from the other sites. Among Skegemog wares, approximately two-thirds of the vessels contain some form of exterior decoration. The reverse situation is seen among the comparative sites where approximately one-third of the vessels exhibit exterior

decoration (Table 28). Furthermore, when exterior decoration is present, there is a slightly higher tendency for it to be located on the rim/collar of the vessel. Placement within any given decorative field, however, is similar between the two ceramic samples. Overall design layout is also similar between the two groups. Although multiple bands of decoration are infrequent in Skegemog ware, they are totally absent in the samples from the region to the south. There is also a slightly higher tendency for tools with rounded cross sections to be used in the region south of Skegemog Point (Table 28). Finally, although a second band of decoration is uncommon among Skegemog ware, it never occurs among the ceramic sets in the region to the south.

The occurrence of decorated lips and/or rim interiors among the vessels from the comparative sites is also suppressed in comparison to Skegemog ware (Table 28). Only 18% of the vessels from west central Michigan have decorated lips, while they are decorated in 61% of the cases from Skegemog Point. Furthermore, the placement of decoration within the three sub-fields of the lip is more variable among Skegemog ware vessels. An emphasis on lip decoration is a trait most typically associated with "northern" tier ceramics such as Mackinac ware (McPherron 1967:87-97).

Similar differences in the amount of decoration on the interior of the vessel rim is also seen between the two ceramic sets (Table 28). Twenty-four percent of the Skegemog ware vessels exhibit decoration on their rim interiors, while it occurs on only 6% of the vessels from west central Michigan. The early Late Woodland vessels from the Point Arcadia site, however, deviate from this pattern. The frequency of decorated rim interiors at Point Arcadia is comparable to the figure for the Skegemog Point site (Table 28). The reasons for this are not clear. It may, in part, reflect the fact that the early Late Woodland component at the site is the product of numerous logistically oriented occupations, possibly by a number of different social groups.

Table 28. Frequency of Early Late Woodland Attributes

ATTRIBUTE	SP	URSUM	PC	MT48	MC	MG	PA	SA	JB
PASTE TEXTURE:									
COARSE SAND	14.6	37.5	0.0	8.3	0.0	11.6	6.7	14.3	37.5
FINE SAND	30.3	0.0	37.5	0.0	16.7	34.9	6.7	14.3	12.5
SILTY	55.1	62.5	62.5	91.7	83.3	53.5	86.7	71.4	50.0
PASTE DENSITY:									
FRIABLE	11.1	12.5	0.0	0.0	16.7	11.6	13.3	0.0	50.0
MOD. COMPACT	25.3	0.0	0.0	8.3	0.0	11.6	0.0	28.6	0.0
COMPACT	47.0	0.0	37.5	41.7	50.0	34.9	40.0	14.3	50.0
VERY COMPACT	18.2	87.5	62.5	50.0	33.3	41.9	46.7	57.1	0.0
TEMPER SIZE:									
FINE	12.6	0.0	18.8	25.0	16.7	39.5	33.3	42.9	0.0
MEDIUM	40.9	75.0	62.5	50.0	33.3	32.6	40.0	14.3	62.5
COARSE	46.5	25.0	18.8	41.7	50.0	27.9	26.7	42.9	37.5
TEMPER PERCENT:									
1-3%	16.7	0.0	50.0	0.0	33.3	25.6	46.7	85.7	0.0
5-10%	51.5	25.0	40.6	100.0	50.0	60.5	33.3	14.3	12.5
11-19%	18.7	25.0	12.5	0.0	16.7	11.6	13.3	0.0	62.5
20+%	13.6	50.0	0.0	0.0	0.0	2.3	6.7	0.0	25.0
EXTERIOR ZONING:									
YES	9.1	0.0	3.1	8.3	33.3	9.3	0.0	0.0	0.0
NO	90.9	100.0	96.9	91.7	66.7	90.7	100.0	100.0	100.0

Table 28 (cont'd).

ATTRIBUTE	SP	URSUM	PC	MT48	MC	MG	PA	SA	JB
SURFACE TREATMENT:									
FINE CORDMARK	9.6	0.0	21.9	0.0	33.3	18.6	13.3	0.0	12.5
MEDIUM CORDMARK	21.7	37.5	34.4	41.7	33.3	34.9	53.3	42.9	25.0
COARSE CORDMARK	14.1	0.0	0.0	16.7	0.0	2.3	0.0	0.0	0.0
FABRIC	31.3	0.0	28.1	8.3	0.0	37.2	0.0	14.3	25.0
SM. FINE CORDMARK	1.0	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0
SM. MED. CORDMARK	7.1	0.0	6.3	16.7	16.7	4.7	20.0	42.9	37.5
SM. COARSE CORDMARK	3.5	0.0	6.3	0.0	0.0	2.3	6.7	0.0	0.0
SM. FABRIC	6.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SMOOTH	5.1	0.0	0.0	16.7	16.7	0.0	6.7	0.0	0.0
EXTERIOR PATTERN:									
1	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	2.5	0.0	0.0	0.0	0.0	4.7	0.0	0.0	0.0
4	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	1.0	0.0	3.1	0.0	0.0	4.7	0.0	0.0	0.0
7	0.0	0.0	0.0	0.0	16.7	0.0	0.0	0.0	0.0
16	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	0.0	0.0	0.0	8.3	0.0	0.0	0.0	0.0	0.0
21	0.0	0.0	0.0	0.0	16.7	0.0	0.0	0.0	0.0
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23	47.0	100.0	43.8	33.3	33.3	60.5	60.0	42.9	50.0
24	20.7	0.0	37.5	25.0	0.0	14.0	0.0	0.0	0.0
25	0.5	0.0	3.1	8.3	0.0	2.3	6.7	0.0	0.0
26	0.0	0.0	9.4	8.3	16.7	4.7	20.0	28.6	37.5

Table 28 (cont'd).

ATTRIBUTE	SP	URSUM	PC	MT48	MC	MG	PA	SA	JB
27	0.5	0.0	0.0	0.0	0.0	7.0	6.7	0.0	0.0
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.3	0.0
29	11.1	0.0	0.0	0.0	0.0	0.0	0.0	14.3	12.5
30	5.6	0.0	0.0	0.0	0.0	2.3	0.0	0.0	0.0
31	6.1	0.0	0.0	16.7	16.7	0.0	6.7	0.0	0.0
LIP FORM:									
FLAT	100.0	100.0	100.0	91.7	100.0	100.0	100.0	100.0	100.0
SCALLOPED	0.0	0.0	0.0	8.3	0.0	0.0	0.0	0.0	0.0
LIP PROFILE:									
FLAT	48.0	50.0	53.1	41.7	83.3	34.9	40.0	42.9	62.5
ROUND	12.6	25.0	9.4	8.3	0.0	23.3	33.3	14.3	12.5
WEDGE	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BEVELED	5.6	0.0	0.0	8.3	0.0	2.3	0.0	0.0	0.0
SPLAYED	21.2	12.5	18.8	25.0	16.7	14.0	20.0	28.6	25.0
ROLLED	10.1	12.5	18.8	16.7	0.0	25.6	6.7	14.3	0.0
LIP TREATMENT:									
FINE CORDMARK	6.6	0.0	12.5	8.3	16.7	14.0	6.7	0.0	0.0
MEDIUM CORDMARK	7.1	12.5	21.9	25.0	16.7	27.9	20.0	42.9	12.5
COARSE CORDMARK	4.5	0.0	21.9	0.0	0.0	0.0	0.0	14.3	0.0
FABRIC	12.6	62.5	9.4	0.0	0.0	25.6	0.0	0.0	25.0
SM. FINE CORDMARK	1.0	0.0	31.3	0.0	0.0	0.0	0.0	0.0	0.0
SM. MED. CORDMARK	1.5	0.0	0.0	16.7	16.7	4.7	20.0	0.0	0.0

Table 28 (cont'd).

ATTRIBUTE	SP	URSUM	PC	MT48	MC	MG	PA	SA	JB
SM. COARSE CORDMARK	1.0	0.0	0.0	8.3	0.0	0.0	0.0	0.0	0.0
	3.5	0.0	0.0	8.3	0.0	0.0	0.0	0.0	0.0
	62.1	25.0	0.0	33.3	50.0	27.9	53.3	42.9	62.5
LIP EVERSION:									
YES	33.3	37.5	12.5	8.3	0.0	39.5	33.3	42.9	12.5
NO	66.7	62.5	87.5	91.7	100.0	60.5	66.7	57.1	87.5
RIM SHAPE:									
STRAIGHT	65.2	62.5	93.8	83.3	100.0	72.1	80.0	100.0	0.0
CURVED	34.8	37.5	6.3	16.7	0.0	27.9	20.0	0.0	0.0
RIM PROFILE:									
STRAIGHT	49.0	87.5	65.6	83.3	33.3	74.4	80.0	85.7	62.5
WEDGE	4.5	0.0	0.0	0.0	66.7	0.0	0.0	0.0	0.0
THICKEN TO LIP	9.1	0.0	9.4	0.0	0.0	7.0	13.3	0.0	12.5
COLLARED	37.4	12.5	25.0	16.7	0.0	18.6	6.7	14.3	25.0
RELATIVE RIM HEIGHT:									
SHORT	59.6	87.5	81.3	66.7	100.0	76.7	100.0	85.7	87.5
MEDIUM	37.9	12.5	18.8	25.0	0.0	23.3	0.0	14.3	12.5
HIGH	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 28 (cont'd).

ATTRIBUTE	SP	URSUM	PC	MT48	MC	MG	PA	SA	JB
RIM EVERSION:									
NONE	21.7	12.5	62.5	33.3	66.7	60.5	33.3	14.3	12.5
SLIGHT	30.8	0.0	31.3	58.3	16.7	23.3	46.7	57.1	75.0
MEDIUM	33.3	87.5	6.3	8.3	16.7	16.3	13.3	28.6	12.5
GREAT	14.1	12.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
COLLAR PROFILE:									
SQUARE	2.0	0.0	12.5	0.0	50.0	2.3	0.0	0.0	12.5
WEDGE	6.1	0.0	0.0	0.0	0.0	2.3	6.7	0.0	0.0
ROUND	29.3	12.5	12.5	8.3	16.7	0.0	0.0	14.3	12.5
OTHER	0.0	0.0	0.0	0.0	0.0	14.0	0.0	0.0	0.0
COLLAR DEFINITION:									
WEAK	19.7	0.0	18.8	8.3	50.0	9.3	6.7	0.0	12.5
GOOD	17.7	12.5	6.3	0.0	16.7	9.3	0.0	14.3	12.5
BOLD	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RELATIVE COLLAR HEIGHT:									
SHORT	23.2	12.5	21.9	8.3	66.7	18.6	6.7	14.3	12.5
MEDIUM	13.6	0.0	3.1	0.0	0.0	0.0	0.0	0.0	12.5
HIGH	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LIP DECORATION:									
YES	61.6	12.5	12.5	41.7	0.0	14.0	26.7	28.6	25.0
NO	38.4	87.5	87.5	58.3	100.0	86.0	73.3	71.4	75.0

Table 28 (cont'd).

ATTRIBUTE	SP	URSUM	PC	MT48	MC	MG	PA	SA	JB
PLAIN TOOL EDGE	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PLAIN PADDLE END	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PLAIN PADDLE EDGE	5.1	0.0	0.0	16.7	0.0	0.0	0.0	0.0	0.0
PLAIN PADDLE CORNER	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CW PADDLE END	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CW PADDLE EDGE	7.1	0.0	0.0	0.0	0.0	0.0	0.0	14.3	12.5
CW PADDLE CORNER	0.0	12.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LIP ELEMENT ROBUSTNESS:									
SHALLOW	18.7	0.0	0.0	0.0	0.0	4.7	0.0	14.3	0.0
MEDIUM	21.7	12.5	6.3	41.7	0.0	7.0	26.7	0.0	25.0
DEEP	21.2	0.0	6.3	0.0	0.0	2.3	0.0	14.3	0.0
LIP ELEMENT SHAPE:									
RECTANGULAR	24.2	0.0	0.0	16.7	0.0	2.3	0.0	28.6	0.0
RECT.-LINEAR	24.2	12.5	6.3	8.3	0.0	0.0	0.0	0.0	0.0
OVOID	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CIRCULAR	11.6	0.0	3.1	16.7	0.0	9.3	20.0	0.0	25.0
CRESCENT	0.5	0.0	0.0	0.0	0.0	0.0	6.7	0.0	0.0
LINEAR	0.0	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0
CHEVRON	0.0	0.0	0.0	0.0	0.0	2.3	0.0	0.0	0.0
LIP ELEMENT ORIENTATION:									
VERTICAL	42.4	0.0	6.3	25.0	0.0	4.7	20.0	14.3	12.5
HORIZONTAL	0.0	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0

Table 28 (cont'd).

ATTRIBUTE	SP	URSUM	PC	MT48	MC	MG	PA	SA	JB
RIM INTERIOR DEC. ROBUSTNESS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SHALLOW	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MEDIUM	12.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DEEP	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EXTERIOR DECORATION:									
YES	66.2	25.0	34.4	8.3	33.3	37.2	26.7	57.1	37.5
NO	33.8	62.5	65.6	91.7	66.7	86.0	73.3	42.9	62.5
BAND 1 LOCATION:									
RIM	5.6	0.0	12.5	0.0	0.0	7.0	6.7	0.0	0.0
COLLAR	6.1	0.0	3.1	8.3	16.7	30.2	0.0	0.0	0.0
NECK	54.0	25.0	18.8	0.0	16.7	0.0	20.0	57.1	37.5
RIM/NECK	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAND 1 POSITION:									
TOP	10.1	0.0	6.3	0.0	0.0	18.6	0.0	0.0	12.5
MIDDLE	31.8	12.5	28.1	0.0	0.0	7.0	26.7	57.1	25.0
BOTTOM	21.2	12.5	0.0	0.0	16.7	11.6	0.0	0.0	0.0
ENTIRE	3.0	0.0	0.0	8.3	16.7	0.0	0.0	0.0	0.0
BAND 1 NUMBER OF ROWS:									
ONE	63.6	25.0	31.3	8.3	33.3	37.2	26.7	57.1	37.5
TWO OR MORE	2.5	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0

Table 28 (cont'd).

ATTRIBUTE	SP	URSUM	PC	MT48	MC	MG	PA	SA	JB
BAND 1 TYPE:									
PUNCTATE	50.5	25.0	28.1	8.3	16.7	34.9	26.7	28.6	37.5
IMPRESSED	12.1	0.0	6.3	0.0	0.0	2.3	0.0	0.0	0.0
MULTIPLE PUNCTATE	3.5	0.0	0.0	0.0	0.0	0.0	0.0	28.6	0.0
INCISED/TRAILED	0.0	0.0	0.0	0.0	16.7	0.0	0.0	0.0	0.0
BAND 1 MOTIF:									
ROW OF ELEMENTS	66.2	25.0	34.4	8.3	33.3	37.2	26.7	57.1	37.5
BAND 1 ELEMENT SHAPE:									
RECTANGULAR	41.9	25.0	0.0	0.0	0.0	16.3	6.7	0.0	0.0
SQUARE	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CIRCULAR	0.0	0.0	18.8	0.0	16.7	11.6	6.7	0.0	25.0
OVOID	13.1	0.0	15.6	0.0	0.0	9.3	13.3	57.1	12.5
HEMISPHERE	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TRIANGULAR	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CRESECENT	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAND 1 TOOL:									
FINGER END/NAIL	1.0	0.0	0.0	0.0	0.0	0.0	0.0	28.6	0.0
CW STICK-PT	0.0	0.0	3.1	0.0	16.7	9.3	0.0	0.0	0.0
CW STICK EDGE	1.5	0.0	6.3	0.0	0.0	0.0	0.0	0.0	0.0
CD-WRAPPED OBJECT	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
KNOT/KINKED CORD	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PLAIN STICK-PT	3.0	0.0	9.4	0.0	0.0	2.3	13.3	0.0	12.5

Table 28 (cont'd).

ATTRIBUTE	SP	URSUM	PC	MT48	MC	MG	PA	SA	JB
PLAIN STICK-DULL	8.6	0.0	12.5	0.0	0.0	7.0	6.7	28.6	25.0
PLAIN STICK-EDGE	0.0	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0
PLAIN TOOL-RAGGED	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PLAIN TOOL-CHISEL	6.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PLAIN TOOL-DULL	10.6	0.0	0.0	0.0	0.0	7.0	6.7	0.0	0.0
PLAIN PADDLE END	20.7	0.0	0.0	0.0	0.0	9.3	0.0	0.0	0.0
PLAIN PADDLE EDGE	0.0	12.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PLAIN PADDLE CORNER	3.5	12.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CW PADDLE END	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CW PADDLE EDGE	0.0	0.0	0.0	0.0	0.0	2.3	0.0	0.0	0.0
CW PADDLE CORNER	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAND 1 TOOL ANGLE:									
STRAIGHT IN	46.0	0.0	25.0	8.3	33.3	30.2	26.7	28.6	37.5
ANGLED LEFT	2.0	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0
ANGLED RIGHT	6.6	25.0	6.3	0.0	0.0	7.0	0.0	0.0	0.0
ANGLED UP	11.6	0.0	0.0	0.0	0.0	0.0	0.0	28.6	0.0
BAND 1 ELEMENT ROBUSTNESS:									
SHALLOW	4.0	0.0	0.0	0.0	16.7	0.0	0.0	0.0	0.0
MEDIUM	22.2	0.0	12.5	8.3	16.7	2.3	0.0	28.6	0.0
DEEP	39.9	25.0	21.9	0.0	0.0	34.9	13.3	28.6	0.0

Table 28 (cont'd).

ATTRIBUTE	SP	URSUM	PC	MT48	MC	MG	PA	SA	JB
BAND 1 ELEMENT ORIENTATION:									
VERTICAL	33.3	12.5	25.0	0.0	16.7	27.9	20.0	42.9	37.5
HORIZONTAL	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OBLIQUE RIGHT	28.3	12.5	6.3	0.0	0.0	9.3	6.7	0.0	0.0
OBLIQUE LEFT	3.5	0.0	3.1	0.0	0.0	0.0	0.0	14.3	0.0
BAND 2 DECORATION:									
YES	8.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NO	91.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N OF CASES	198	8	32	12	6	43	15	7	8

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Key to Abbreviations:

SP = Skegegmog Point

Ursun = Ursun Collection

PC = Porter Creek South

MT48 = Manistee Blacker Airport 3

MC = Magoon Creek

MG = McGlynn

PA = Point Arcadia

SA = Santer

JB = Juniper Beach

A number of other differences in general attribute trends between the two sets of early Late Woodland ceramics are also apparent. These differences occur primarily among aspects of vessel morphology and surface treatment type (Table 28). In general, the samples from the comparative collections exhibit slightly higher frequencies of cordmarked exteriors and lips (55% and 40%, respectively) and much lower levels of smoothed (28%) and fabric impressed (21%) surfaces. The presence of collars on the rims is also more infrequent and the rims tend to be less everted (Table 28) among the sites south of Grand Traverse Bay. Collar profiles also tend to be more variable in the region south of Skegemog Point. The frequency of different lip profiles is similar between the two samples. Given that splayed profiles are more closely associated with northern ceramic traditions, this situation was not expected. Finally, while the frequencies of different paste textures and temper characteristics are comparable between the two ceramic sets, there is a tendency for more compact pastes among the comparative collections.

Although there is a lot of similarity between the two sets of early Late Woodland vessels, some important differences exist between them. The greatest differences occur in some of the more highly visible attribute sets: decoration of the vessel exterior, lip and rim, and the degree of rim flare. The other differences enumerated above occur among either low visibility or technological attributes. As indicated by Brashler's (1981) study of early Late Woodland ceramics, it is these kinds of frequency differences that serve to distinguish the various early Late Woodland wares from one another. Based on this fact, it appears that the differences between the ceramics from Skegemog Point and those from the sites to the south are sufficient to suggest that two different style pools are involved.

In regards to currently defined ceramic types, the vessels from the sites in west central Michigan exhibit closest typological affiliation with Spring Creek wares from the Muskegon Valley (Brashler 1981:244, 253-255; Fitting 1968a:23-26). This is

particularly true with the ceramics from the McGlynn, Magoon Creek, Porter Creek South, and Juniper Beach sites. Spring Creek ceramics are typically small to medium-sized cordmarked jars with straight to moderately everted rims (Brashler 1981; Fitting 1968a). Exterior decoration is even more infrequent, occurring on only 11.2% of the vessels (Brashler (1981:345). In contrast, the frequency of decorated lips (22.9%) and decorated rim interiors (8.9%) among Spring Creek ware (Brashler 1981:345-346) is comparable to the numbers seen among the sites north of the Muskegon Valley. Similar frequencies are also seen in the occurrence of collared rims and the degree of rim eversion.

The primary differences with Spring Creek ware occur in the frequency of exterior decoration, the co-occurrence of exterior decoration and collared rims, and lip profile shapes. First, Brashler(1981:354) noted that a large percentage of the decorated vessels are also collared. The reverse of this situation is present among the sites from west central Michigan, where none of the collared vessels are decorated. Among Skegemog wares, collaring and exterior decoration are not mutually exclusive, although there is less of a correspondence between these two attributes than with Spring Creek ware. The second difference lies in the relative frequency of exterior decoration between Spring Creek and Skegemog ware and the comparative sites. While low, the order of magnitude between the comparative sites and Spring Creek ware was about the same as it is with Skegemog ware. Finally, 18% of the lips from the comparative collections exhibit splayed profiles while the lips of Spring Creek vessels are never splayed (Brashler 1981:345).

In sum, the vessels from the comparative collections analyzed here show similarities to both Skegemog ware and Spring Creek ware. The degree of similarity, however, is strongest with Spring Creek ware. In regards to the differences which are present, the vessels from west central Michigan tend to exhibit

frequencies intermediary to those seen among Skegemog ware and Spring Creek wares from the Muskegon Valley. This can be considered a continuation of the pattern of clinal distribution of early Late Woodland ceramic attributes first identified by McPherron (1967) in the Straits of Mackinac region.

The major differences in attribute frequencies between Skegemog ware and the ceramic samples from west central Michigan are also reflected in the structure of the dendrogram (Figure 56). The dendrogram shows a nearly complete separation of the vessels from the Skegemog Point site from the vessels from the sites in west central Michigan. As already noted, most of the comparative samples contain high frequencies of undecorated vessels. A majority of the vessels from the comparative sites link together before any appreciable numbers of Skegemog vessels enter into the equation. Furthermore, the vessels from the sites with the larger sample sizes tend to cluster together before joining with vessels from other sites. The vessels from Skegemog Point also tend to cluster together before joining clusters of vessels from the comparative sites. Although this pattern is present throughout the dendrogram, it is most pronounced among the decorated vessels. This is a function of the higher frequency of decoration and greater stylistic variability among the Skegemog wares.

In conclusion, this analysis indicates that the early Late Woodland ceramics from west central Michigan are most closely related to the style pool represented by Spring Creek ware. Due to the location of the type site and general similarities with Allegan and Wayne wares, Spring Creek ware has often been characterized as a "southern" ceramic type (Fitting 1968a). The results presented here, however, indicate that Spring Creek ware is, in fact, the early Late Woodland ceramic expression along the west central coast of Michigan. The southern stylistic affinities seen among the Spring Creek wares from the Muskegon Valley may be considered to be a product of the fact they occur near the boundary between Spring Creek and Allegan wares. In turn, since most of the comparative sites examined here lie in or near the Manistee

Valley, this area can be considered the northern extent of Spring Creek ware. Thus, the general distribution of Spring Creek ware roughly corresponds with the extent of the Carolinian-Canadian transition zone.

Further, it can be concluded that a cultural boundary is present somewhere between the Manistee Valley and the southern end of Grand Traverse Bay. The inclusion of the Point Arcadia and Santer sites with the other southern sites suggests that the actual location of the boundary may lie in the general region suggested by Cleland (1990:Map 1). It must be remembered that group mobility appears to be relatively high during the early Late Woodland period (Fitting 1975), so rigid spatial boundaries are not expected. The similarities which do exist between the ceramics in west central Michigan and Skegemog ware indicate that some interaction is occurring. This is commensurate with the intermediate level of social patterning identified by Brashler (1981:337-339) in southern Michigan during the early Late Woodland period.

The geographic distribution of data points for the early Late Woodland period prohibits rigorous evaluation of the resulting patterns in terms of Voss and Young's (1989) expectations. Some general tendencies are indicated, however. It is suggested that the early Late Woodland pattern exhibits closest similarities with Voss and Young's (1989) second and fifth expectations. Their second expectation relates high visibility attributes with clinal distributions to the presence of significant cultural boundaries across which there is little interaction. The fifth expectation relates low visibility attributes with clinal distributions to interaction among small social groups. While the most significant differences between the ceramic sets examined here occur among the attributes with the highest level of visibility, most of these differences are not extreme. In fact, most of the differences between the two ceramic sets occur among low visibility and technological attributes. While numerically higher than differences in decoration, the differences are of low orders of magnitude. As a result, the fifth expectation (interaction among small social groups) is favored over the second. A more

geographically dispersed sample is necessary to demonstrate whether this suggestion is valid.

Twenty-four sites and locales with a total of 270 vessels were employed in the analysis of the late phase of the Late Woodland period (Table 29). The Traverse phase sample from the Skegemog Point site includes 307 vessels. The comparative sites for this phase of the late Woodland period include: Henderson Lamb, Schuler, Point Arcadia and Burnham, Aetna I and II, Boven, Fifth Avenue Beach, McGlynn, 20MT48, Porter Creek North and South, Hamlin Lake, Quick/Notapekagon, Dumaw Creek, Silver Lake, Little Pebawma Village, 20GR91, the five sites in the Cushman collection, and northeastern Mason County (Figure 1). These sites are grouped into six general clusters: 1) near the Skegemog Point site, 2) the lower Manistee Valley, 3) the interior of Missaukee County, 4) central Clare County, 5) the area including, and south of, the Pere Marquette Valley, and 6) central Gratiot County. While the geographic distribution of sites is greater for this phase than that of the earlier phase, problems of small and highly variable sample sizes are still present, particularly in Area 5 and large portions of Area 2.

As with the early phase, minor changes occurred in the structure of the Traverse ware dendrogram when the comparative samples were included (Figure 57). The most noticeable change occurred with the Complex Decorated and Punctate varieties of Traverse ware. In this case, the Complex Decorated variety keyed out before the Punctate variety. The level at which these two varieties keyed out, however, are the same between the two dendrograms. This is presumed to be the result of the analytic method rather than cultural factors.

Overall, examination of the attribute frequencies between Traverse ware and the ceramic samples to the south reveals a great deal of similarity between the two ceramic sets (Table 29). The differences which are present relate primarily to a small number

Table 29. Frequency of Late Late Woodland Attributes

ATTRIBUTE	SP	HL	SC	AE1	AE2	BO	PA	MG	MB	FA
PASTE TEXTURE:										
COARSE SAND	31.3	42.9	15.4	38.9	36.4	50.0	25.9	25.0	0.0	33.3
FINE SAND	38.4	28.6	38.5	11.1	45.5	50.0	24.1	0.0	0.0	0.0
SILTY	30.3	28.6	46.2	50.0	18.2	0.0	50.0	75.0	100.0	66.7
PASTE DENSITY:										
FRIABLE	32.2	28.6	38.5	22.2	36.4	0.0	25.9	25.0	0.0	66.7
MOD. COMPACT	29.3	28.6	23.1	27.8	36.4	50.0	31.0	0.0	50.0	0.0
COMPACT	33.9	38.1	38.5	50.0	27.3	50.0	36.2	50.0	50.0	33.3
VERY COMPACT	4.2	4.8	0.0	0.0	0.0	0.0	6.9	25.0	0.0	0.0
TEMPER SIZE:										
FINE	12.4	23.8	7.7	11.1	9.1	0.0	12.1	25.0	100.0	33.3
MEDIUM	48.2	52.4	69.2	44.4	36.4	0.0	50.0	75.0	0.0	0.0
COARSE	39.4	23.8	69.2	44.4	54.5	100.0	37.9	0.0	0.0	66.7
TEMPER PERCENT:										
1-3%	9.8	23.8	30.8	22.2	18.2	0.0	22.4	0.0	0.0	33.3
5-10%	48.9	47.6	53.8	61.1	63.6	50.0	37.9	100.0	100.0	33.3
11-19%	22.1	9.5	15.4	5.6	9.1	50.0	24.1	0.0	0.0	33.3
20+%	19.2	19.0	0.0	11.1	9.1	0.0	15.5	0.0	0.0	0.0
EXTERIOR ZONING:										
YES	36.2	47.6	46.2	11.1	27.3	50.0	32.8	0.0	0.0	66.7
NO	63.8	52.4	53.8	88.9	72.7	50.0	67.2	100.0	100.0	0.0

Table 29 (cont'd).

ATTRIBUTE	SP	HL	SC	AE1	AE2	BO	PA	MG	MB	FA
14	3.3	4.8	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	7.8	9.5	15.4	0.0	0.0	0.0	3.4	0.0	0.0	0.0
17	1.3	0.0	0.0	5.6	9.1	50.0	3.4	0.0	0.0	0.0
18	3.3	0.0	7.7	0.0	0.0	0.0	3.4	0.0	0.0	0.0
19	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	0.3	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23	12.4	19.0	7.7	0.0	18.2	0.0	22.4	100.0	0.0	0.0
24	3.6	4.8	0.0	0.0	0.0	0.0	13.8	0.0	0.0	0.0
25	1.0	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.0
26	1.6	0.0	0.0	11.1	18.2	0.0	8.6	0.0	50.0	0.0
27	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.0
29	1.3	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31	42.7	19.0	46.2	77.8	45.5	50.0	19.0	0.0	50.0	33.3
LIP FORM:										
FLAT	58.6	81.0	69.2	72.2	54.5	50.0	74.1	0.0	50.0	100.0
SCALLOPED	24.8	9.5	23.1	0.0	18.2	0.0	19.0	0.0	50.0	0.0
PEAKED	13.7	9.5	7.7	27.8	18.2	0.0	3.4	0.0	0.0	0.0
CASTELLATED	2.9	0.0	0.0	0.0	9.1	50.0	3.4	0.0	0.0	0.0

Table 29 (cont'd).

ATTRIBUTE	SP	HL	SC	AE1	AE2	BO	PA	MG	MB	FA
LIP PROFILE:										
FLAT	40.4	47.6	53.8	38.9	54.5	50.0	44.8	75.0	100.0	33.3
ROUND	23.5	14.3	7.7	11.1	9.1	0.0	27.6	25.0	0.0	0.0
WEDGE	5.9	0.0	15.4	0.0	9.1	0.0	10.3	0.0	0.0	0.0
BEVELED	16.6	9.5	0.0	16.7	18.2	50.0	12.1	0.0	0.0	66.7
SPLAYED	4.2	9.5	7.7	5.6	9.1	0.0	1.7	0.0	0.0	0.0
ROLLED	9.1	19.0	15.4	27.8	0.0	0.0	3.4	0.0	0.0	0.0
LIP TREATMENT:										
FINE CORDMARK	4.6	4.8	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.0
MEDIUM CORDMARK	4.6	0.0	15.4	5.6	0.0	0.0	1.7	50.0	0.0	0.0
COARSE CORDMARK	8.1	14.3	15.4	5.6	18.2	0.0	3.4	0.0	0.0	0.0
FABRIC	1.3	0.0	0.0	5.6	0.0	0.0	1.7	0.0	0.0	0.0
SM. FINE CORDMARK	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SM. MED. CORDMARK	2.0	0.0	0.0	0.0	18.2	0.0	1.7	0.0	0.0	0.0
SM. COARSE CORDMARK	0.7	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.0
SM. FABRIC	0.3	0.0	0.0	5.6	0.0	0.0	1.7	0.0	0.0	0.0
SMOOTH	77.9	81.0	69.2	77.8	63.6	100.0	86.2	50.0	100.0	100.0
RIM SHAPE:										
STRAIGHT	96.1	100.0	100.0	100.0	100.0	100.0	94.8	100.0	100.0	100.0
CURVED	3.6	0.0	0.0	0.0	0.0	0.0	5.2	0.0	0.0	0.0

Table 29 (cont'd).

ATTRIBUTE	SP	HL	SC	AE1	AE2	BO	PA	MG	MB	FA
RIM PROFILE:										
STRAIGHT	45.9	66.7	76.9	66.7	72.7	100.0	62.1	0.0	100.0	33.3
WEDGE	0.0	4.8	0.0	0.0	0.0	0.0	3.4	0.0	0.0	0.0
THICKEN TO LIP	3.9	9.5	15.4	5.6	9.1	0.0	3.4	0.0	0.0	0.0
COLLARED	50.2	19.0	7.7	27.8	18.2	0.0	31.0	100.0	0.0	66.7
RELATIVE RIM HEIGHT:										
SHORT	28.3	19.0	30.8	27.8	63.6	0.0	27.6	50.0	100.0	0.0
MEDIUM	62.2	81.0	69.2	72.2	36.4	100.0	72.4	50.0	0.0	100.0
HIGH	9.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RIM EVERSION:										
NONE	26.4	33.3	15.4	50.0	36.4	0.0	34.5	75.0	50.0	100.0
SLIGHT	48.5	47.6	46.2	38.9	63.6	50.0	39.7	25.0	50.0	0.0
MEDIUM	17.6	9.5	38.5	11.1	0.0	50.0	15.5	0.0	0.0	0.0
GREAT	7.2	9.5	0.0	0.0	0.0	0.0	10.3	0.0	0.0	0.0
COLLAR PROFILE:										
SQUARE	12.7	4.8	0.0	22.2	9.1	0.0	10.3	25.0	0.0	0.0
WEDGE	33.6	14.3	7.7	5.6	9.1	0.0	20.7	25.0	0.0	33.3
ROUND	2.9	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	33.3
COLLAR DEFINITION:										
WEAK	29.0	9.5	7.7	22.2	18.2	0.0	22.4	0.0	0.0	33.3
GOOD	19.9	0.0	0.0	5.6	0.0	0.0	8.6	100.0	0.0	33.3

Table 29 (cont'd).

ATTRIBUTE	SP	HL	SC	AE1	AE2	BO	PA	MG	MB	FA
LIP TOOL:										
FINGER END/NAIL	11.7	4.8	7.7	0.0	18.2	0.0	0.0	0.0	0.0	0.0
CW STICK END	0.0	4.8	0.0	11.1	0.0	50.0	0.0	0.0	0.0	33.3
CD-WRAPPED OBJECT	6.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CORD	15.3	9.5	7.7	27.8	0.0	50.0	0.0	0.0	0.0	0.0
KNOT/KINKED CORD	0.3	0.0	0.0	0.0	9.1	0.0	0.0	0.0	0.0	0.0
PLAIN STICK-PT	0.7	0.0	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PLAIN STICK-DULL	2.0	0.0	0.0	0.0	18.2	0.0	0.0	0.0	0.0	0.0
PLAIN STICK EDGE	2.6	9.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PLAIN TOOL RAG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PLAIN TOOL-CHISEL	5.2	28.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PLAIN TOOL-DULL	7.8	4.8	0.0	22.2	18.2	0.0	0.0	25.0	0.0	0.0
PLAIN TOOL EDGE	1.6	0.0	15.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PLAIN PADDLE END	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PLAIN PADDLE EDGE	0.0	0.0	0.0	11.1	9.1	0.0	0.0	0.0	0.0	0.0
CW PADDLE EDGE	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LIP TOOL ANGLE:										
STRAIGHT IN	40.4	57.1	23.1	55.6	54.5	100.0	0.0	25.0	0.0	33.3
ANGLED LEFT	0.0	4.8	0.0	0.0	9.1	0.0	0.0	0.0	0.0	0.0
ANGLED RIGHT	2.0	0.0	7.7	16.7	9.1	0.0	0.0	0.0	0.0	0.0
PINCHED	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LOOPED	8.5	0.0	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 29 (cont'd).

ATTRIBUTE	SP	HL	SC	AE1	AE2	BO	PA	MG	MB	FA
LIP ELEMENT ROBUSTNESS:										
SHALLOW	11.7	9.5	15.4	16.7	9.1	0.0	0.0	0.0	0.0	0.0
MEDIUM	29.0	38.1	23.1	55.6	63.6	100.0	0.0	0.0	0.0	33.3
DEEP	15.0	14.3	0.0	0.0	0.0	0.0	0.0	25.0	0.0	0.0
LIP ELEMENT SHAPE:										
RECTANGULAR	9.4	9.5	23.1	38.9	18.2	0.0	6.9	25.0	0.0	0.0
RECT.-LINEAR	26.7	42.9	7.7	22.2	9.1	50.0	10.3	0.0	0.0	0.0
OVOID	18.9	4.8	7.7	11.1	36.4	50.0	31.0	0.0	0.0	33.3
CIRCULAR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CRESCENT	0.0	4.8	0.0	0.0	9.1	0.0	0.0	0.0	0.0	0.0
LINEAR	1.6	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.0
CHEVRON	3.3	0.0	0.0	0.0	0.0	0.0	3.4	0.0	0.0	0.0
LIP ELEMENT ORIENTATION:										
VERTICAL	36.8	33.3	30.8	72.2	36.4	50.0	0.0	25.0	0.0	33.3
HORIZONTAL	6.8	0.0	0.0	0.0	9.1	0.0	0.0	0.0	0.0	0.0
OBLIQUE RIGHT	16.3	4.8	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OBLIQUE LEFT	0.0	19.0	0.0	0.0	18.2	50.0	0.0	0.0	0.0	0.0
COMBINATION	1.3	4.8	0.0	0.0	9.1	0.0	0.0	0.0	0.0	0.0
RIM INTERIOR DECORATION:										
YES	4.6	4.8	0.0	5.6	0.0	0.0	0.0	0.0	0.0	0.0
NO	94.8	95.2	100.0	94.4	100.0	100.0	53.4	100.0	100.0	100.0

Table 29 (cont'd).

ATTRIBUTE	SP	HL	SC	AE1	AE2	BO	PA	MG	MB	FA
RIM INTERIOR ELEMENT ORIENTATION:										
VERTICAL	2.9	4.8	0.0	5.6	0.0	0.0	0.0	0.0	0.0	0.0
HORIZONTAL	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OBLIQUE RIGHT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OBLIQUE LEFT	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RIM INTERIOR DEC. ROBUSTNESS:										
SHALLOW	2.3	4.8	0.0	5.6	0.0	0.0	0.0	0.0	0.0	0.0
MEDIUM	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DEEP	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EXTERIOR DECORATION:										
YES	44.0	57.1	15.4	55.6	54.5	0.0	31.0	0.0	0.0	66.7
NO	56.0	42.9	84.6	44.4	45.5	100.0	69.0	100.0	100.0	33.3
EXTERIOR DECORATIVE MOTIF :										
LINEAR-VERTICAL	41.4	57.1	15.4	55.6	54.5	0.0	31.0	0.0	0.0	66.7
LINEAR-OBL RIGHT	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LINEAR-OBL LEFT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CURVILINEAR	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAND 1 LOCATION:										
RIM	12.1	42.9	7.7	22.2	45.5	0.0	17.2	0.0	0.0	0.0
COLLAR	23.1	4.8	7.7	27.8	9.1	0.0	13.8	0.0	0.0	33.3
NECK	7.5	9.5	0.0	5.6	0.0	0.0	0.0	0.0	0.0	33.3

Table 29 (cont'd).

ATTRIBUTE	SP	HL	SC	AE1	AE2	BO	PA	MG	MB	FA
SHOULDER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RIM/NECK	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
COLLAR/NECK	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAND 1 POSITION:										
TOP	7.2	19.0	7.7	16.7	9.1	0.0	0.0	0.0	0.0	0.0
MIDDLE	6.2	9.5	0.0	0.0	9.1	0.0	3.4	0.0	0.0	33.3
BOTTOM	23.5	19.0	7.7	16.7	27.3	0.0	10.3	0.0	0.0	33.3
ENTIRE	4.9	9.5	0.0	16.7	9.1	0.0	17.2	0.0	0.0	0.0
SPANS	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OTHER	0.0	0.0	0.0	5.6	0.0	0.0	0.0	0.0	0.0	0.0
BAND 1 NUMBER OF ROWS:										
ONE	38.4	57.1	15.4	22.2	45.5	0.0	22.4	0.0	0.0	66.7
TWO OR MORE	5.5	0.0	0.0	33.3	9.1	0.0	8.6	0.0	0.0	0.0
BAND 1 TYPE:										
PUNCTATE	14.7	33.3	0.0	38.9	27.3	0.0	13.8	0.0	0.0	66.7
IMPRESSED	7.8	19.0	7.7	16.7	18.2	0.0	12.1	0.0	0.0	0.0
PINCHED	19.5	4.8	7.7	0.0	9.1	0.0	0.0	0.0	0.0	0.0
DRAG-JAB	1.3	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.0
INCISE/TRAIL	0.3	0.0	0.0	0.0	0.0	0.0	3.4	0.0	0.0	0.0

Table 29 (cont'd).

ATTRIBUTE	SP	HL	SC	AE1	AE2	BO	PA	MG	MB	FA
BAND 1 MOTIF:										
ROW OF ELEMENTS	40.4	57.1	15.4	50.0	54.5	0.0	19.0	0.0	0.0	66.7
CONTINUOUS LINEAR	1.3	0.0	0.0	0.0	0.0	0.0	5.2	0.0	0.0	0.0
CONT LIN & FIELD	0.7	0.0	0.0	5.6	0.0	0.0	0.0	0.0	0.0	0.0
INTERRUPTED LIN	1.3	0.0	0.0	0.0	0.0	0.0	6.9	0.0	0.0	0.0
CONFIG BAND	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAND 1 ELEMENT SHAPE:										
RECTANGULAR	3.3	23.8	7.7	16.7	27.3	0.0	1.7	0.0	0.0	33.3
SQUARE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CIRCULAR	9.8	4.8	0.0	16.7	0.0	0.0	1.7	0.0	0.0	0.0
OVOID	20.2	14.3	7.7	16.7	18.2	0.0	15.5	0.0	0.0	33.3
HEMISPHERE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LUNATE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LINEAR	5.2	0.0	0.0	0.0	0.0	0.0	12.1	0.0	0.0	0.0
TRIANGULAR	3.6	0.0	7.7	5.6	9.1	0.0	0.0	0.0	0.0	0.0
CRESCENT	1.3	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OTHER	0.0	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAND 1 TOOL:										
FINGER END/NAIL	18.6	4.8	7.7	0.0	9.1	0.0	1.7	0.0	0.0	0.0
CWSTICK END	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CW STICK EDGE	1.6	4.8	0.0	0.0	0.0	0.0	5.2	0.0	0.0	0.0
CORD	2.3	0.0	0.0	5.6	0.0	0.0	1.7	0.0	0.0	0.0
KNOT/KINKED CORD	1.0	0.0	0.0	11.1	0.0	0.0	0.0	0.0	0.0	0.0

Table 29 (cont'd).

ATTRIBUTE	SP	HL	SC	AE1	AE2	BO	PA	MG	MB	FA
PLAIN STICK-PT	0.0	4.8	0.0	5.6	18.2	0.0	5.2	0.0	0.0	0.0
PLAIN STICK-DULL	4.9	4.8	0.0	11.1	9.1	0.0	5.2	0.0	0.0	33.3
PLAIN STICK EDGE	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PLAIN TOOL RAG	0.0	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PLAIN TOOL-CHISEL	3.3	14.3	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.0
PLAIN TOOL-DULL	7.2	9.5	7.7	16.7	9.1	0.0	8.6	0.0	0.0	33.3
PLAIN TOOL EDGE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PLAIN PADDLE END	0.3	9.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PLAIN PADDLE EDGE	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PL. PADDLE CORNER	0.3	0.0	0.0	0.0	9.1	0.0	0.0	0.0	0.0	0.0
OTHER	0.0	0.0	0.0	5.6	0.0	0.0	0.0	0.0	0.0	0.0
334										
BAND 1 TOOL ANGLE:										
STRAIGHT IN	6.8	33.3	0.0	50.0	27.3	0.0	0.0	0.0	0.0	66.7
ANGLED LEFT	0.0	0.0	7.7	0.0	9.1	0.0	0.0	0.0	0.0	0.0
ANGLED RIGHT	17.6	9.5	0.0	5.6	9.1	0.0	0.0	0.0	0.0	0.0
ANGLED UP	2.9	9.5	0.0	0.0	9.1	0.0	0.0	0.0	0.0	0.0
PINCHED	16.3	4.8	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAND 1 ELEMENT ROBUSTNESS:										
SHALLOW	3.9	23.8	7.7	11.1	0.0	0.0	0.0	0.0	0.0	0.0
MEDIUM	13.4	33.3	0.0	44.4	45.5	0.0	0.0	0.0	0.0	0.0
DEEP	18.6	0.0	7.7	0.0	9.1	0.0	0.0	0.0	0.0	66.7

Table 29 (cont'd).

ATTRIBUTE	SP	HL	SC	AE1	AE2	BO	PA	MG	MB	FA
BAND 2 TOOL ANGLE:										
STRAIGHT IN	1.6	0.0	0.0	16.7	9.1	0.0	0.0	0.0	0.0	0.0
ANGLED RIGHT	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ANGLED UP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ANGLED DOWN	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PINCHED	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAND 2 ELEMENT SHAPE:										
RECTANGULAR	0.3	0.0	0.0	0.0	9.1	0.0	0.0	0.0	0.0	0.0
CIRCULAR	2.6	0.0	0.0	5.6	0.0	0.0	0.0	0.0	0.0	0.0
OVOID	0.3	0.0	0.0	11.1	0.0	0.0	0.0	0.0	0.0	0.0
LINEAR	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAND 2 ROBUSTNESS:										
SHALLOW	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MEDIUM	1.6	0.0	0.0	16.7	9.1	0.0	0.0	0.0	0.0	0.0
DEEP	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAND 2 ELEMENT ORIENT:										
VERTICAL	2.0	0.0	0.0	16.7	9.1	0.0	0.0	0.0	0.0	0.0
HORIZONTAL	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OBLIQUE RIGHT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OBLIQUE LEFT	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
N OF CASES	307	21	13	18	11	2	58	4	2	3

Table 29 (cont'd).

ATTRIBUTE	PC	BS	SH	QK	CH	DC	LP	SL	HP	TOTAL
PASTE TEXTURE:										
COARSE SAND	50.0	66.7	33.3	16.7	43.5	30.0	0.0	85.7	NA	31.5
FINE SAND	0.0	33.3	33.3	33.3	43.5	20.0	80.0	14.3	NA	26.3
SILTY	50.0	0.0	33.3	50.0	13.0	50.0	20.0	0.0	NA	34.1
PASTE DENSITY:										
FRIABLE	50.0	66.7	33.3	0.0	56.5	20.0	20.0	85.7	NA	30.4
MOD. COMPACT	0.0	0.0	33.3	66.7	19.6	45.0	40.0	14.3	NA	28.1
COMPACT	0.0	0.0	33.3	33.3	19.6	25.0	20.0	0.0	NA	27.8
VERY COMPACT	50.0	33.3	0.0	0.0	4.3	10.0	20.0	0.0	NA	5.6
TEMPER SIZE:										
FINE	0.0	0.0	0.0	0.0	0.0	25.0	0.0	42.9	NA	12.2
MEDIUM	0.0	0.0	33.3	50.0	34.8	45.0	100.0	42.9	NA	41.5
COARSE	100.0	100.0	66.7	50.0	54.3	30.0	0.0	14.3	NA	38.5
TEMPER PERCENT:										
1-3%	0.0	0.0	0.0	16.7	0.0	25.0	40.0	0.0	NA	15.6
5-10%	50.0	33.3	100.0	33.3	28.3	37.5	60.0	85.7	NA	40.4
11-19%	0.0	33.3	0.0	33.3	52.2	15.0	0.0	0.0	NA	21.1
20+%	50.0	0.0	0.0	16.7	19.6	22.5	0.0	14.3	NA	14.4

[illegible]

Table 29 (cont'd).

ATTRIBUTE	PC	BS	SH	QK	CH	DC	LP	SL	HP	TOTAL
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	66.7	33.3	0.0	2.2	0.0	20.0	0.0	0.0	2.6
13	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.4
14	0.0	0.0	0.0	0.0	2.2	0.0	0.0	0.0	0.0	1.1
15	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.4
16	0.0	0.0	0.0	0.0	2.2	0.0	0.0	0.0	0.0	2.6
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9
18	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	1.5
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.4
21	0.0	0.0	0.0	0.0	0.0	7.5	0.0	0.0	4.5	1.5
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
23	0.0	0.0	0.0	16.7	10.9	10.0	20.0	0.0	77.3	19.6
24	0.0	0.0	0.0	16.7	4.3	0.0	0.0	0.0	0.0	4.4
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
26	0.0	33.3	0.0	0.0	6.5	22.5	40.0	28.6	0.0	10.0
27	0.0	0.0	0.0	16.7	0.0	2.5	0.0	0.0	0.0	1.1
29	0.0	0.0	0.0	0.0	28.3	0.0	0.0	0.0	0.0	5.2
30	0.0	0.0	0.0	0.0	4.3	0.0	0.0	0.0	0.0	0.7
31	50.0	0.0	66.7	50.0	34.8	45.0	20.0	71.4	18.2	35.2

Table 29 (cont'd).

ATTRIBUTE	PC	BS	SH	OK	CH	DC	LP	SL	HP	TOTAL
LIP FORM:										
FLAT	0.0	100.0	66.7	100.0	93.5	77.5	100.0	100.0	72.7	77.4
SCALLOPED	50.0	0.0	33.3	0.0	0.0	12.5	0.0	0.0	13.6	11.1
PEAKED	50.0	0.0	0.0	0.0	6.5	5.0	0.0	0.0	0.0	6.7
CASTELLATED	0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	13.6	3.3
LIP PROFILE:										
FLAT	100.0	66.7	66.7	66.7	71.7	55.0	40.0	42.9	59.1	55.2
ROUND	0.0	0.0	33.3	16.7	4.3	12.5	0.0	42.9	13.6	14.4
WEDGE	0.0	0.0	0.0	0.0	0.0	2.5	20.0	0.0	4.5	4.8
BEVELED	0.0	0.0	0.0	0.0	10.9	10.0	20.0	0.0	4.5	10.4
SPLAYED	0.0	0.0	0.0	0.0	2.2	2.5	0.0	0.0	0.0	3.0
ROLLED	0.0	33.3	0.0	16.7	10.9	17.5	20.0	14.3	18.1	10.7
LIP TREATMENT:										
FINE CORDMARK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	0.7
MEDIUM CORDMARK	0.0	0.0	0.0	0.0	2.2	0.0	0.0	0.0	0.0	2.6
COARSE CORDMARK	0.0	0.0	0.0	0.0	4.3	7.5	0.0	0.0	4.5	5.9
FABRIC	0.0	0.0	0.0	0.0	6.5	0.0	0.0	0.0	13.6	2.6
SM. FINE CORDMARK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SM. MED. CORDMARK	0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	1.9
SM. COARSE CORDMARK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
SM. FABRIC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	1.1
SMOOTH	100.0	100.0	100.0	100.0	87.0	87.5	100.0	100.0	72.7	81.1

Table 29 (cont'd).

ATTRIBUTE	PC	BS	SH	OK	CH	DC	LP	SL	HP	TOTAL
RIM SHAPE:										
STRAIGHT	100.0	100.0	100.0	83.3	100.0	90.0	100.0	100.0	100.0	97.0
CURVED	0.0	0.0	0.0	16.7	0.0	10.0	0.0	0.0	0.0	3.0
RIM PROFILE:										
STRAIGHT	50.0	33.3	33.3	83.3	39.1	90.0	80.0	71.4	72.7	64.1
WEDGE	0.0	0.0	0.0	16.7	2.2	0.0	0.0	0.0	0.0	1.9
THICKEN TO LIP	0.0	0.0	0.0	0.0	2.2	5.0	0.0	0.0	0.0	4.1
COLLARED	50.0	66.7	66.7	0.0	56.5	5.0	20.0	28.6	27.3	30.0
RELATIVE RIM HEIGHT:										
SHORT	0.0	0.0	0.0	66.7	21.7	35.0	20.0	0.0	31.8	28.1
MEDIUM	100.0	100.0	100.0	33.3	78.3	65.0	80.0	100.0	68.2	71.5
HIGH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
RIM EVERSION:										
NONE	0.0	0.0	33.3	83.3	32.6	45.0	60.0	42.9	27.3	37.0
SLIGHT	100.0	100.0	33.3	16.7	39.1	27.5	40.0	57.1	59.1	41.5
MEDIUM	0.0	0.0	33.3	0.0	21.7	15.0	0.0	0.0	13.6	15.6
GREAT	0.0	0.0	0.0	0.0	6.5	12.5	0.0	0.0	0.0	5.9
COLLAR PROFILE:										
SQUARE	0.0	0.0	33.3	0.0	8.7	5.0	20.0	0.0	0.0	8.9
WEDGE	50.0	66.7	33.3	0.0	43.5	0.0	0.0	28.6	22.7	18.9
ROUND	0.0	0.0	0.0	0.0	4.3	0.0	0.0	0.0	4.5	2.2

Table 29 (cont'd).

ATTRIBUTE	PC	BS	SH	QK	CH	DC	LP	SL	HP	TOTAL
COLLAR DEFINITION:										
WEAK	0.0	66.7	66.7	0.0	30.4	0.0	20.0	28.6	0.0	17.0
GOOD	50.0	0.0	0.0	0.0	26.1	0.0	0.0	0.0	0.0	9.3
RELATIVE COLLAR HEIGHT:										
SHORT	0.0	0.0	0.0	0.0	21.7	0.0	20.0	0.0	0.0	11.5
MEDIUM	50.0	66.7	66.7	0.0	34.8	0.0	0.0	28.6	0.0	15.6
HIGH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LIP DECORATION:										
YES	50.0	33.3	33.3	33.3	76.1	52.5	80.0	14.3	40.9	55.6
NO	50.0	66.7	66.7	66.7	23.9	47.5	20.0	85.7	59.1	44.4
LIP LOCATION:										
SURFACE	0.0	0.0	33.3	33.3	67.4	15.0	40.0	14.3	36.4	40.7
INTERIOR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
EXTERIOR	0.0	0.0	0.0	0.0	4.3	30.0	40.0	0.0	4.5	7.8
INTERIO/EXTERIOR	0.0	33.3	0.0	0.0	2.2	7.5	0.0	0.0	0.0	4.1
INTERIOR/SURFACE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
EXTERIOR/SURFACE	0.0	0.0	0.0	0.0	2.2	0.0	0.0	0.0	0.0	0.7
CONTINUOUS	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7
LIP TYPE:										
PUNCTATE	0.0	33.3	0.0	33.3	69.6	5.0	0.0	0.0	9.1	18.9
IMPRESSED	50.0	0.0	33.3	0.0	2.2	40.0	80.0	14.3	27.3	33.3

Table 29 (cont'd).

ATTRIBUTE	PC	BS	SH	QK	CH	DC	LP	SL	HP	TOTAL
PINCHED	0.0	0.0	0.0	0.0	2.2	7.5	0.0	0.0	0.0	1.9
DRAG JAB	0.0	0.0	0.0	0.0	2.2	0.0	0.0	0.0	0.0	0.4
LIP TOOL:										
FINGER END/NAIL	0.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0	0.0	1.9
CW STICK END	0.0	0.0	33.3	0.0	0.0	0.0	0.0	0.0	0.0	2.2
CD-WRAPPED OBJECT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CORD	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7
KNOT/KINKED CORD	0.0	33.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7
PLAIN STICK-PT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
PLAIN STICK-DULL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7
PLAIN STICK EDGE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
PLAIN TOOL RAG	0.0	0.0	0.0	33.3	0.0	0.0	0.0	0.0	0.0	0.7
PLAIN TOOL-CHISEL	0.0	0.0	0.0	0.0	0.0	0.0	40.0	0.0	0.0	3.0
PLAIN TOOL-DULL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0
PLAIN TOOL EDGE	0.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0	0.0	1.1
PLAIN PADDLE END	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PLAIN PADDLE EDGE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.3	0.0	1.5
CW PADDLE EDGE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LIP TOOL ANGLE:										
STRAIGHT IN	0.0	33.3	33.3	33.3	0.0	0.0	80.0	0.0	0.0	16.3
ANGLED LEFT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7
ANGLED RIGHT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.3	0.0	2.2

Table 29 (cont'd).

ATTRIBUTE	PC	BS	SH	QK	CH	DC	LP	SL	HP	TOTAL
PINCHED	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LOOPED	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7
LIP ELEMENT ROBUSTNESS:										
SHALLOW	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3
MEDIUM	0.0	33.3	0.0	16.7	0.0	0.0	80.0	14.3	0.0	14.4
DEEP	0.0	0.0	33.3	16.7	0.0	0.0	0.0	0.0	0.0	2.2
LIP ELEMENT SHAPE:										
RECTANGULAR	0.0	0.0	0.0	33.3	30.4	5.0	20.0	0.0	0.0	14.1
RECT.-LINEAR	50.0	0.0	0.0	0.0	26.1	5.0	40.0	0.0	0.0	14.4
OVOID	0.0	33.3	33.3	0.0	13.0	42.5	20.0	14.3	27.3	23.0
CIRCULAR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CRESCENT	0.0	0.0	0.0	0.0	2.2	0.0	0.0	0.0	0.0	1.1
LINEAR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
CHEVRON	0.0	0.0	0.0	0.0	4.3	0.0	0.0	0.0	0.0	1.5
LIP ELEMENT ORIENTATION:										
VERTICAL	50.0	33.3	33.3	33.3	0.0	0.0	60.0	14.3	0.0	15.2
HORIZONTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
OBLIQUE RIGHT	0.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0	0.0	1.1
OBLIQUE LEFT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6
COMBINATION	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7

Table 29 (cont'd).

ATTRIBUTE	PC	BS	SH	OK	CH	DC	LP	SL	HP	TOTAL
RIM INTERIOR ELEMENT SHAPE:										
RECTANGULAR	0.0	33.3	0.0	0.0			0.0	0.0		0.7
OVOID	0.0	0.0	0.0	0.0	2.2	0.0	0.0	0.0	0.0	0.7
CIRCULAR	0.0	0.0	0.0	0.0	2.2	0.0	0.0	0.0	0.0	0.4
LINEAR	0.0	0.0	0.0	0.0	6.5	0.0	0.0	0.0	0.0	1.1
RIM INTERIOR ELEMENT ORIENTATION:										
VERTICAL	0.0	33.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
HORIZONTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OBLIQUE RIGHT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OBLIQUE LEFT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RIM INTERIOR DEC. ROBUSTNESS:										
SHALLOW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7
MEDIUM	0.0	33.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
DEEP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EXTERIOR DECORATION:										
YES	50.0	0.0	33.3	16.7	34.8	7.5	0.0	0.0	27.3	29.3
NO	50.0	100.0	66.7	83.3	65.2	92.5	100.0	100.0	72.7	54.8
EXTERIOR DECORATIVE MOTIF :										
LINEAR-VERTICAL	50.0	0.0	33.3	16.7	0.0	7.5	0.0	0.0	0.0	21.1
LINEAR-OBL RIGHT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 29 (cont'd).

ATTRIBUTE	PC	BS	SH	QK	CH	DC	LP	SL	HP	TOTAL
LINEAR-OBL LEFT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CURVILINEAR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAND 1 LOCATION:										
RIM	0.0	0.0	0.0	16.7	10.9	5.0	0.0	0.0	13.6	14.8
COLLAR	50.0	0.0	33.3	0.0	17.4	2.5	0.0	0.0	13.6	11.9
NECK	0.0	0.0	0.0	0.0	6.5	0.0	0.0	0.0	0.0	2.6
SHOULDER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RIM/NECK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
COLLAR/NECK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAND 1 POSITION:										
TOP	0.0	0.0	0.0	0.0	4.3	5.0	0.0	0.0	9.1	5.6
MIDDLE	0.0	0.0	0.0	0.0	10.9	2.5	0.0	0.0	9.1	5.2
BOTTOM	50.0	0.0	33.3	16.7	4.3	0.0	0.0	0.0	4.5	9.3
ENTIRE	0.0	0.0	0.0	0.0	15.2	0.0	0.0	0.0	4.5	8.9
SPANS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OTHER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
BAND 1 NUMBER OF ROWS:										
ONE	50.0	0.0	33.3	16.7	26.1	7.5	0.0	0.0	27.3	23.3
TWO OR MORE	0.0	0.0	0.0	0.0	8.7	0.0	0.0	0.0	0.0	5.9

Table 29 (cont'd).

ATTRIBUTE	PC	BS	SH	QK	CH	DC	LP	SL	HP	TOTAL
BAND 1 TOOL:										
FINGER END/NAIL	0.0	0.0	0.0	0.0	2.2	2.5	0.0	0.0	0.0	1.1
CWSTICK END	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	0.0
CW STICK EDGE	0.0	0.0	33.3	0.0	6.5	0.0	0.0	0.0	9.0	0.7
CORD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
KNOT/KINKED CORD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7
PLAIN STICK-PT										
PLAIN STICK-DULL	0.0	0.0	0.0	0.0	2.2	0.0	0.0	0.0	0.0	1.9
50.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2
PLAIN STICK EDGE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PLAIN TOOL RAG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
PLAIN TOOL-CHISEL	0.0	0.0	0.0	0.0	13.0	0.0	0.0	0.0	0.0	1.1
PLAIN TOOL-DULL	0.0	0.0	0.0	16.7	8.7	0.0	0.0	0.0	13.6	3.3
PLAIN TOOL EDGE	0.0	0.0	0.0	0.0	0.0	7.5	0.0	0.0	0.0	0.0
PLAIN PADDLE END	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7
PLAIN PADDLE EDGE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PL. PADDLE CORNER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
OTHER	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.4
BAND 1 TOOL ANGLE:										
STRAIGHT IN	50.0	0.0	33.3	16.7	23.9	2.5	0.0	0.0	27.3	9.3
ANGLED LEFT	0.0	0.0	0.0	0.0	2.2	0.0	0.0	0.0	0.0	0.7
ANGLED RIGHT	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	1.5
ANGLED UP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
PINCHED	0.0	0.0	0.0	0.0	6.5	2.5	0.0	0.0	0.0	0.7

Table 29 (cont'd).

ATTRIBUTE	PC	BS	SH	QK	CH	DC	LP	SL	HP	TOTAL
BAND 1 ELEMENT ROBUSTNESS:										
SHALLOW	0.0	0.0	0.0	0.0	4.3	2.5	0.0	0.0	0.0	3.0
MEDIUM	50.0	0.0	33.3	0.0	28.3	0.0	0.0	0.0	27.3	8.1
DEEP	0.0	0.0	0.0	16.7	2.2	5.0	0.0	0.0	0.0	2.2
BAND 1 ELEMENT ORIENTATION:										
VERTICAL	50.0	0.0	33.3	16.7	13.0	7.5	0.0	0.0	4.5	9.3
HORIZONTAL	0.0	0.0	0.0	0.0	2.2	0.0	0.0	0.0	4.5	0.4
OBLIQUE RIGHT	0.0	0.0	0.0	0.0	8.7	0.0	0.0	0.0	13.6	3.0
OBLIQUE LEFT	0.0	0.0	0.0	0.0	2.2	0.0	0.0	0.0	4.5	0.7
BAND 2 DECORATION:										
YES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.6	1.5
NO	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	86.4	36.3
BAND 2 LOCATION:										
RIM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	0.4
COLLAR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.0	0.7
NECK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
RIM/NECK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAND 2 POSITION:										
TOP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MIDDLE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
BOTTOM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.0	1.1

Table 29 (cont'd).

ATTRIBUTE	PC	BS	SH	OK	CH	DC	LP	SL	HP	TOTAL
ENTIRE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SPANS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	0.0
BAND 2 NUMBER OF ROWS										
ONE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.6	0.4
TWO OR MORE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAND 2 TYPE:										
PUNCTATE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.6	1.1
IMPRESSED	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
PINCHED	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DRAG/JAB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAND 2 MOTIF:										
ROW OF ELEMENTS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.0	1.5
CONTINUOUS LINEAR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	0.0
INTERRUPTED LIN.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAND 2 TOOL:										
FINGER END/NAIL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CW STICK EDGE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	0.4
CD-WRAPPED OBJECT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.0	0.0
CORD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PLAIN STICK-DULL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7

Table 29 (cont'd).

ATTRIBUTE	PC	BS	SH	QK	CH	DC	LP	SL	HP	TOTAL
BAND 2 ELEMENT ORIENT:										
VERTICAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	1.5
HORIZONTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OBLIQUE RIGHT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.0	0.0
OBLIQUE LEFT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
N OF CASES	2	3	3	6	46	40	5	7	22	270.0

Key to Abbreviations:

SP = Skegemog Point

HL = Henderson LMAB

SC = Schuler

AE1 = Aetna I

AE2 = Aetna II

BO = Boven

PA = Point Arcadia

MG = McGlynn

MB = Manistee Blacker Airport 3

FA = Fifth Avenue Beach

PC = Porter Creek North and South

BS = Bear Swamp

SH = Sheridan Township, Mason County

QK = Quick/Notapekagon

CH = Cushman Collection

DC = Dumaaw Creek

LP = Little Pebawma Village

SL = Silver Lake

HP = 20GR91

of morphological attributes. Specifically, a much higher frequency of scalloped and peaked lips occur among the vessels from the Skegemog Point site. A much higher incidence of collared rims is also seen among the Skegemog Point vessels. In both attributes, the frequency of occurrence is about doubled at the Skegemog Point site. A small number of differences in vessel decoration are also present between the two samples. These differences are represented by a decrease in the complexity of the designs and the number of vessels exhibiting two or more bands of decoration in the area south of Grand Traverse Bay. Since vessels with complex decorative motifs are a distinct minority at the Skegemog Point site, caution must be exercised in assigning cultural meaning to these differences.

Examination of all of the comparative collections as a single group, however, obscures a number of important similarities and differences present across the region. In the ensuing discussion, the frequency of the major morphologic and stylistic attributes across the six geographic clusters of sites is examined. Once again, due to highly variable sample sizes among the sites used in this stage of the analysis, caution must be exercised in the interpretation of attribute frequency distribution.

Overall, vessel morphology and decoration is very similar among the six regional sub-divisions. The distribution of lip forms shows some of the strongest differences. As noted above, the use of scalloped and peaked lips is considered highly characteristic of Traverse ware and some of the highest frequencies of occurrence are seen at the Skegemog Point site. Similar frequencies of scalloped lips are seen only at the Schuler, Aetna I, and Point Arcadia sites. The reasons for the general absence of scalloped lips at the Henderson Lamb site, located only a short distance from Skegemog Point, are unclear. Since the site lies within the estimated age range for grit tempered scalloped lip vessels (see Chapter 3 and Garland 1989:5), the low level of this attribute at Henderson Lamb may be a product of sampling error. Along the southern edge of the study area, moderately low levels of lip scalloping occur at the Dumaw

Creek site and 20GR91 where it occurs on slightly more than 10% of the vessels (Table 29).

A slightly different pattern is seen in the distribution of the other non-flat lip forms. In decreasing orders of magnitude, peaked lips occur most frequently at the Aetna I, Aetna II, and Skegemog Point sites (Table 29). Beyond these sites peaked lips are quite rare, occurring only on isolated vessels at Point Arcadia, Porter Creek, and Dumaw Creek. Furthermore, while never common anywhere in the study area, castellated lips are most common at 20GR91 in the southeast corner of the region. Thus, lip form provides the first line of evidence for distinctive differences between the area around the southern end of Grand Traverse Bay and the west central coastal region of Michigan.

Differences in the frequencies of lip profiles are also apparent between the two ceramic sets (Table 29). In general, a higher frequency of rolled lips and a lower frequency of rounded and beveled lips are seen in the comparative collections. At the Henderson Lamb, Aetna I, and Dumaw Creek sites, rolled lips are nearly twice as frequent as at the Skegemog Point site. Lower magnitudes of differences are also seen at Schuler, Quick, 20GR91, and the sites around Harrison, Michigan. Frequencies of rounded lips similar to those at Skegemog Point are only seen at Point Arcadia and McGlynn; elsewhere, the frequencies are significantly lower. In contrast, comparable frequencies of beveled lips are seen only at Skegemog Point, Aetna I and II, Point Arcadia, and 20GR91. Although not as clear as with the distribution of lip forms, a general north-south dichotomy is present among lip profile, with the exception of 20GR91.

The other major set of morphological attributes examined in this study, rim form, exhibits only small differences among all of the sites and collections. The only major difference is seen among the relative frequency of collared rims at each of the sites (Table 29). At Skegemog Point, about one-half of the Traverse phase vessels are

collared. Similar frequencies are seen only at Dumaw Creek and at the sites around Harrison, Michigan. Other than these sites and except for the sites represented by small samples, the frequency of collared vessels ranges between approximately one-quarter and one-third of the assemblages. Several other differences in rim form were also noted. The rims at the Schuler site tend to be more greatly everted and there is a tendency for a higher occurrence of square, rather than wedge-shaped, collars at the Aetna I site.

Systematic variation in the extent of the use of zoned surface treatments and the types of surface preparation employed also occur (Table 29). Once again, zoned surfaces occur predominantly at the sites in the northern part of the study area (Aetna I and II, Skegemog Point, Henderson Lamb, Schuler, and Point Arcadia). In the southern end of the study area, comparable frequencies of zoned surfaces are present only at the Dumaw Creek site. However, it is only at Skegemog Point and the Aetna earthworks that smoothed areas are incorporated into the different patterns of zoning to any great degree. At the other sites, zoned surfaces are created primarily by the juxtaposition of differently oriented cord or fabric impressions. Beyond this, however, the relative frequencies of different surface treatment types are fairly comparable across the collections. The greater range in surface treatment types exhibited at Skegemog Point is not surprising given the large size of the sample from this site. Finally, there is a slight tendency for the sites in the west central part of Michigan to have higher frequencies of completely smoothed surfaces, while Skegemog Point exhibits higher frequencies of partially smoothed surfaces.

The same order of differences seen among the attributes discussed above continues to be seen among the purely decorative attributes. The occurrence of decorated lips at Skegemog Point is slightly over 50%. Much higher frequencies of lip decoration occur at the Aetna earthworks and the sites around Harrison, Michigan (Table 29). With the exception of Point Arcadia, which has comparable levels of lip

decoration to Skegemog Point, all of the other sites exhibit much lower frequencies of lip decoration. On those vessels which do exhibit lip decoration, there is a high degree of similarity in the placement of the decoration, the type of decoration, and the type of tools used in its execution. The readily observed difference is a very slight tendency for a greater use of the interior and exterior margins of the lip among the non-Skegemog Point vessels.

The frequency of decoration on the rim interiors of the vessels is low at all of the sites considered in this study (Table 29). On those vessels which do have decorated rim interiors, there is a marked similarity in all aspects of the decoration. The only exception to this pattern occurs among the sites comprising Area 5. While still infrequent, these five sites exhibit slightly more than twice the amount of decorated rim interiors as at the other sites.

Some of the greatest differences between the Skegemog Point site and the comparative collections is seen in the amount and kind of exterior decoration (Table 29). In general, these differences are rather limited in extent, but the ones which do occur are considered significant. Similar to the presence of decorated lips, slightly less than half of the vessels from Skegemog Point exhibit some form of exterior decoration. Much lower frequencies of exterior decoration occur at Schuler, Dumaw Creek, and 20GR91, while slightly lower frequencies are seen at Point Arcadia, Quick, and the sites in Area 5. None of the sites show significantly higher frequencies of exterior decoration than at the Skegemog Point site.

In most aspects of the exterior decoration a great deal of similarity is present between the late phase vessels from the Skegemog Point and those from the comparative collections (Table 29). A single band of simple linear motifs dominates in all instances. Exterior decoration is most commonly placed at the bottom of either the rim or the collar of the vessel. Only at the Aetna I site do vessels exhibit significantly higher frequencies of decoration along the top of the rim/collar and the occurrence of

multiple rows of decoration comprising a single decorative band. The most striking decorative differences occur in the decorative technique employed. As with the attributes of peaked lips, and to a lesser degree scalloped lips, this difference occurs in an attribute state highly associated with Traverse ware: the use of pinched design elements. Other than at Skegemog, Point finger pinching occurs only at Henderson Lamb, Schuler, Aetna II, Dumaw Creek, and in Area 5. At all of these sites, however, only a small percentage ($< 10\%$) of the vessels exhibits pinched designs (Table 29). It is twice as frequent at Skegemog Point. A concomitant decrease in the use of fingers as tools for the execution of the designs is also seen.

Other observed differences in exterior decorations are relatively minor (Table 29). Further, most of these differences occur among attributes which have very low levels of visibility and may be considered to lie partially in the realm of idiosyncratic behavior. Thus, with the exception of finger ends/nails, only minor differences are seen in the types of tools used to execute the designs and their angle of application. No patterns could be identified among the frequency distributions of the first attribute. At Skegemog Point, a higher degree of variability is present in the angle at which the tool is applied to the vessel surface. That is, outside of the Skegemog Point site, tools are almost invariably applied perpendicular to the vessel surface. The only other observed decorative difference occurs with a highly visible attribute. Very few of the non-Skegemog Point site vessels exhibit a second band of decoration. This attribute occurs only at the Aetna I and II sites and at 20GR91.

The structure of the dendrogram for the late Late Woodland period (Figure 57) reflects the general similarity between the various ceramic sets considered here. The clear breaks between Skegemog ware and the comparative site vessels seen in the early Late Woodland dendrogram are not present in the subsequent period. In this case, the vessels from the comparative collections are dispersed across virtually every part of the dendrogram. This is considered an indication that there is an increase in the amount of

stylistic similarity between Skegemog Point and the main body of the Carolinian-Canadian transition zone between the early and late phases of the late Woodland period.

Although there may be a general increase in the level of stylistic similarity, the structure of the late phase dendrogram indicates that important differences still exist. The pattern of vessels from each site which group into low level mini-clusters continues to be seen. Furthermore, groups of comparative sites often join together before merging with groups of vessels from the Skegemog Point site. There is also a tendency for the vessels from Skegemog Point to continue to form their own clusters, even at moderate levels of the dendrogram. This phenomenon is particularly apparent among the three main decorated varieties of Traverse ware.

While the vessels from the comparative collections are typologically closest to Traverse ware, some systematic differences do occur between the Skegemog Point assemblage and the vessels from the comparative sites. In general, the sites near Skegemog Point, in the interior of Missaukee County, and around Harrison, Michigan, exhibit some of the closest similarity with the Skegemog Point site. The differences present among these sites and especially among the sites along the coast, however, are not considered to be of sufficient magnitude to indicate the presence of a separate ceramic ware. An exception to this situation appears to be present at Dumaw Creek. It is discussed more fully below. Thus, these ceramics can best be considered a southern variant of Traverse ware.

The distribution of attributes discussed above is now considered in terms of the hypothesized boundaries for the region suggested by Cleland (1990) and the expectations developed by Voss and Young (1989). First, once again, general correspondence with the main group boundaries mapped by Cleland (1990:Map 1) is seen. The existence of a stylistic and cultural boundary between the makers of Traverse

ware and Juntunen ware has already been demonstrated by Lovis (1973). The general lack of shared design elements and decorative motifs between these two wares indicate that this boundary is relatively strong.

South of Skegemog Point, the distribution of attributes appears to conform most closely to aspects of the first and fourth expectations for the interpretation of stylistic behavior developed by Voss and Young (1989). The first expectation relates to high visibility attributes with uniform distributions which are considered to reflect the general extent of a cultural system. The fourth expectation relates to low visibility attributes with uniform distributions. It has been argued above that, within the study area, there is a great deal of similarity in the general morphology of the vessels and in the primary structure of their decorative designs. This is interpreted as an indication that during the late Late Woodland period, at least, one broad cultural system is present in the Carolinian-Canadian transition zone.

The southern extent of this cultural system, however, is not completely clear. First, in general terms, there do not appear to be significant stylistic ties with the contemporaneous Younge and Springwells phase ceramics to the southeast (Fitting 1975; Murphy and Ferris 1990). A similar boundary to that seen with Juntunen ware may be present. The assemblage from the Dumaw Creek site provides some indication that the southern boundary may lie in the region around the Muskegon Valley. Approximately 25% of the vessels from Dumaw Creek exhibit very close similarities with the Moccasin Bluff Modified Lip type (Betteral and Smith 1973). Although a systematic comparison with the Moccasin Bluff site ceramics is beyond the scope of this study, other broad similarities are seen in the use of lip marring with a plain tool or finger as the sole decorative device and the occurrence of scalloped lips. This is interpreted as an indication that the southern boundary of Traverse-related ceramics is characterized by the same type of general attribute trends seen during the early Late Woodland period. That is, this boundary may be the most permeable of the three and

amenable to the diffusion of stylistic attributes. Provided that this interpretation is correct, it provides evidence for the presence of another of Cleland's (1990:Map 1) hypothesized band boundaries.

Within the study area, the presence of one other major boundary is hypothesized by Cleland (1990). Extending across the northern end of the Manistee Valley, this boundary corresponds fairly well with the break between the classic Traverse wares represented by the Skegemog Point assemblage and the southern variant of Traverse ware located along the west central coast of Michigan. The inclusion of some of the interior areas in the upper reaches of the Muskegon Valley with the northern territory is indicated by the stylistic similarities between the Traverse wares from the Skegemog Point site and the vessels from the Missaukee County earthworks.

Interpretation of the strength of this boundary within the Carolinian-Canadian transition zone is difficult. The sharp decrease in the frequency of high visibility attributes such as peaked lips and finger pinched designs may suggest a situation similar to that predicted by Voss and Young's (1989) first expectation. However, a number of other highly visible attributes, such as general vessel morphology and scalloped lips are shared between the two areas. A high degree of similarity in the distribution of low visibility attributes suggests that Voss and Young's (1989) fourth expectation may hold in this case. This fourth pattern is interpreted by Voss and Young (1989) as the product of small group interaction and within group interaction and cooperation. During the late phase of the Late Woodland period, this boundary appears to have been less distinct than among the historic populations in the area.

In conclusion, examination of the ceramic stylistic similarities and differences among the sites used in this study provides a means to identify the presence and strength of cultural boundaries within the main body of the Carolinian-Canadian transition zone. The results of this study demonstrate that the differences between the ceramic wares from the Skegemog Point site and those from the comparative sites

located to the south allow the region to be partitioned into two sub-areas. The boundary between the sub-areas lies approximately along the northern edge of the Manistee River drainage system. While this boundary is present for the duration of the Late Woodland period, the intensity of its expression changes through time. Between the early and late phases of the Late Woodland period there is an increase in the diffusion of stylistic attributes across this boundary.

The changes in the intensity of this boundary correlate with broader changes in the degree of similarity between the two primary ceramic wares at the Skegemog Point site and ceramic wares from the Carolinian and Canadian biotic provinces. Thus, the increase in stylistic similarity within the Carolinian-Canadian transition zone through time coincides with a strengthening of the stylistic boundaries in the region north of the Skegemog Point site. These changes are interpreted as an indication that, by the beginning of the Late Woodland period, there is an adaptive shift oriented towards the unique set of resources offered by the transition zone environment. Finally, while there are cultural boundaries both within the Carolinian-Canadian transition zone and with the adjacent biotic provinces these boundaries are not rigid. These boundaries are best characterized as shades of grey rather than as rigid boundaries across which there is little movement of people or ideas.

CHAPTER 6

CONCLUSIONS

CONCLUSIONS

At the beginning of this study, a broad question regarding the nature of the Late Woodland cultural adaptations and dynamics within the Carolinian-Canadian transition zone was posed. Investigations into this question, however, did not begin with this study. The question was actually first asked nearly thirty years ago and served as a unifying theme for much of the archaeological research carried out in Michigan during the 1960s and early 1970s. This study continues this process of investigation using new perspectives on old data in conjunction with information (i.e. ceramic assemblages) not formerly available. Specifically, the distribution of decorative design elements was chosen as the means by which to gauge the presence and strength of cultural boundaries within the west central part of Michigan.

Addressing the nature of cultural boundaries in the Carolinian-Canadian transition zone involved three main stages of analysis. The first stage of the analysis examined the structure of the ceramic assemblage from the Skegemog Point site. This site contains the largest sample of ceramics in the region. This assemblage also contains the greatest amount of decorative variability in the area and the greatest temporal span. Because of these factors, the ceramic assemblage from the Skegemog Point site is a critical reference point for any consideration of ceramic decoration in western and northwestern Michigan.

Cluster analysis of the ceramic assemblage from the Skegemog Point site largely confirmed the structure of the original intuitively based classification designed by

Cleland (n.d.a.). Only minor modifications were necessary in the structure of the classification for Bowerman and Traverse wares. In the cluster analysis of the Skegemog wares, aspects of vessel decoration functioned as the primary discriminating attributes among the types of Skegemog wares. The original classification focused on the general morphology of the vessel rim as the key discriminating attribute. As a result, the most extensive typological revisions occurred among Skegemog ware.

In the consideration of the three ceramic wares from Skegemog Point, varying degrees of similarity and dissimilarity with other contemporaneous ware types in adjacent regions were identified. Bowerman ware shows the closest typological affinity with Allegan and Wayne wares in southern Michigan. During the Skegemog phase, the direction of primary influence as reflected in design similarities shifts to the north. That is, in general, Skegemog ware is most similar to Mackinac wares from northern Michigan. A number of general similarities with Spring Creek ware from southern Michigan are also present. In the succeeding Traverse phase another shift in the direction of primary stylistic influence is seen. During this period the ceramics from the Skegemog Point site show broad stylistic affinities with more southern ceramic types. This ceramic classification and the broad trends in stylistic similarity served as an initial orientation of the regional analysis.

The second stage of the analysis involved an in-depth consideration of the spatial dynamics of the Skegemog Point site. This provided information regarding the general structure of the social systems which were once present in the study area. The presence of both residually oriented and logistically oriented occupation were identified for both the Skegemog and Traverse phase occupations of the site. Because the distribution of Bowerman ware is largely restricted to the most heavily occupied part of the site, it is unclear whether those occupations were residually or logistically oriented or a combination of the two. Further, it was demonstrated that the activities carried out at the site are generally organized around a hearth. This, in conjunction

with size of areas involved, indicates that the family group was the basic economic unit which provided for its own needs in a domestic mode of production (cf. Sahlins 1972). It was concluded that the occupation at the Skegemog Point site is most closely similar to the Ottawa pattern of organization (Fitting and Cleland 1969). As such, a fair degree of economic and social flexibility would have been present among these populations. .

The goal of the third stage of the analysis specifically addressed the question of whether a distinct, identity signaling social group or groups were present in the Carolinian-Canadian transition zone during the Late Woodland period. This was accomplished by examining the nature of the stylistic similarities and differences between the Skegemog Point site and a series of comparative collections from west central Michigan. Cluster analysis was used as the means by which to gauge these similarities and differences. Because of sample size limitations and lack of directly comparable ceramic sets, Bowerman ware was deleted from this stage of the analysis. The resultant patterns were examined in reference to Cleland's (1990) hypothesized territorial boundaries in the northern Great Lakes and Voss and Young's (1989) six expectations for the interpretation of regional design attribute patterning.

It was possible to draw a number of general conclusions regarding the nature of cultural boundaries and the strength of those boundaries in the study area. For both the early and late phases of the Late Woodland period, there is a general correspondence between the distribution of the ceramic wares and the limits of the Carolinian-Canadian transition zone. This correspondence, however, is neither direct nor complete.

During the early Late Woodland period this analysis identified two distinct style pools within the Carolinian-Canadian transition zone. The first style pool consists of Spring Creek tradition ceramics. The primary distribution of this ceramic ware occurs between the Muskegon Valley and the area just north of the Manistee Valley. In contrast, the distribution of Skegemog ware is largely restricted to the area around the southern end of Grand Traverse Bay and the Traverse Corridor. The intensity of the

boundary between the cultural groups producing these wares is not great. Similarities were drawn between the types of boundary maintenance behavior seen among the manufacturers of Wayne, Allegan, and Spring Creek ware and those seen further north in the transition zone. That is, both Skegemog and Spring Creek ware can be considered to be a part of a broader pattern of clinal variation between different ceramic wares in the Upper Great Lakes region. These types of attribute distributions can be interpreted as a result of permeable social boundaries across which there was little impediment for the diffusion of decorative attributes.

While it was not possible to systematically test propositions regarding social boundary maintenance for Bowerman ware, a similar situation to that seen with Spring Creek and Skegemog wares may be expected. The ability to test this proposition is severely restricted by the fact that the temporal span of Bowerman ware is unclear. Further, the relationship between Bowerman ware and Skegemog ware at the Skegemog Point site is not well understood. Thus, the ability to select appropriate collections of Late Woodland ceramics for comparison is difficult. At this stage, even the possibility that Skegemog ware represents a cultural expansion which either forced the manufacturers of Bowerman ware to relocate or assimilated them can not be confidently dismissed.

During the late phase of the Late Woodland period, a number of changes in the nature of the cultural boundaries were identified. First, there appear to be relatively strong boundaries to the north and to the southeast. The boundary located at the southern end of the study area does not appear to be as strong, based on general similarities with some aspects of Moccasin Bluff wares. Within the limits of the study area, the boundary extending through the area just north of the Manistee Valley continues to be identifiable. There is, however, a qualitative change in the nature of that boundary. During the late Late Woodland period, most of the differences between the ceramic sets in the area around the southern end of Grand Traverse Bay and the

west central coastal area of Michigan are relatively minor. Several major stylistic discontinuities, particularly in the distribution of finger pinched designs and peaked lips, were identified.

Several interpretations were drawn from the patterns seen in the study area during the late Late Woodland period. In general, there appears to be only a single ceramic ware present in the Carolinian-Canadian transition zone during this time period. At least one social boundary subdividing this larger region was identified. The sharing of a large majority of both high and low visibility attributes between these two sub-areas indicates that the boundary was not strong and close social ties were most likely maintained among the groups. A relatively sharp break occurs in several decorative attributes indicating that, despite a highly permeable social boundary, a need by these groups to differentiate themselves stylistically was maintained.

In conclusion, this study has demonstrated that during the Late Woodland period there was a resident population situated in the Carolinian-Canadian transition zone. The distribution of ceramic wares through time correspond well with the general limits of this ecological zone. Further, while there are some differences in the physiography and ecological configuration of the area around the southern end of Grand Traverse Bay and the west central coastal region of Michigan, these differences alone do not account for the presence of an identifiable social boundary between these two areas. Social factors must also be considered as having an impact on these boundaries. Since the presence of discrete populations can be discerned by the early Late Woodland period, it is presumed that the process of adaptation to the unique configuration of resources in the Carolinian-Canadian transition zone began during an earlier time period, possibly the Middle Woodland period. Over time, as this adaptation continued to evolve, there appears to be a strengthening of boundaries at the limits of the region, while stylistic boundaries within the region relaxed to a certain degree.

Although a wide number of factors could seriously affect the results of this analysis, it is believed that it provides a good general picture of social boundary maintenance in the Carolinian-Canadian transition zone. Despite problems of sample size, poor distribution of comparative collections, and an inability to tightly control for stylistic change within each of the ceramic wares, it was possible to extract patterns which could be interpreted and made sense given our current knowledge of Upper Great Lakes area prehistory. This study is viewed as one small contribution to this ever growing pool of knowledge. It is not intended to answer all of the question regarding the cultural adaptations in the region under examination. Rather, it is hoped that this document will spur further interest and help guide future research in an area of Michigan which has not received the archaeological attention it deserves.

APPENDICES

APPENDIX A

OVERVIEW OF THE SKEGEMOG POINT SITE

INTRODUCTION

Skegemog Point is a small peninsula separating two inland lakes a short distance east of Grand Traverse Bay. Although the origin of the word Skegemog is enigmatic (Voeglin 1968:186), the importance of that place to the prehistoric inhabitants of the Grand Traverse Bay region is clear. For nearly 100 centuries people have frequented the peninsula and made a home along the shores of Lake Skegemog, taking advantage of both its location in relation to transportation routes and resources necessary for the conduct of daily life.

Specifically, the Skegemog Point site (20GT2) is located along the junction of the SE 1/4 of the NW 1/4 and the NE 1/4 of the SW 1/4 of Section 24, T28N, R8W, Whitewater Township, Grand Traverse County, Michigan (Figure 58). This extensive site stretches along a series of post-glacial beach ridges, covering an area slightly in excess of 15 acres (37 hectares). Within the bounds of the site two, largely spatially discrete components have been defined. These include the Samels Field site, an Early Archaic occupation, and the Skegemog Point site, an extensive Late Woodland occupation. A small amount of material, primarily projectile points, dating to the intervening Middle Archaic through Middle Woodland periods has also been recovered from the site. It is the Late Woodland occupation, however, that is the focus of this study.

HISTORY OF INVESTIGATIONS

The earliest mention of the Skegemog Point site appears to be in documents associated with Hinsdale's research for the Archaeological Atlas of Michigan published in 1931. The locational information used by Hinsdale was collected by Frank Vreeland, then a staff member at the University of Michigan Museum. In notes from his 1924 survey of northwestern Michigan, Vreeland makes the following enticing entries concerning the area of the Skegemog Point site:

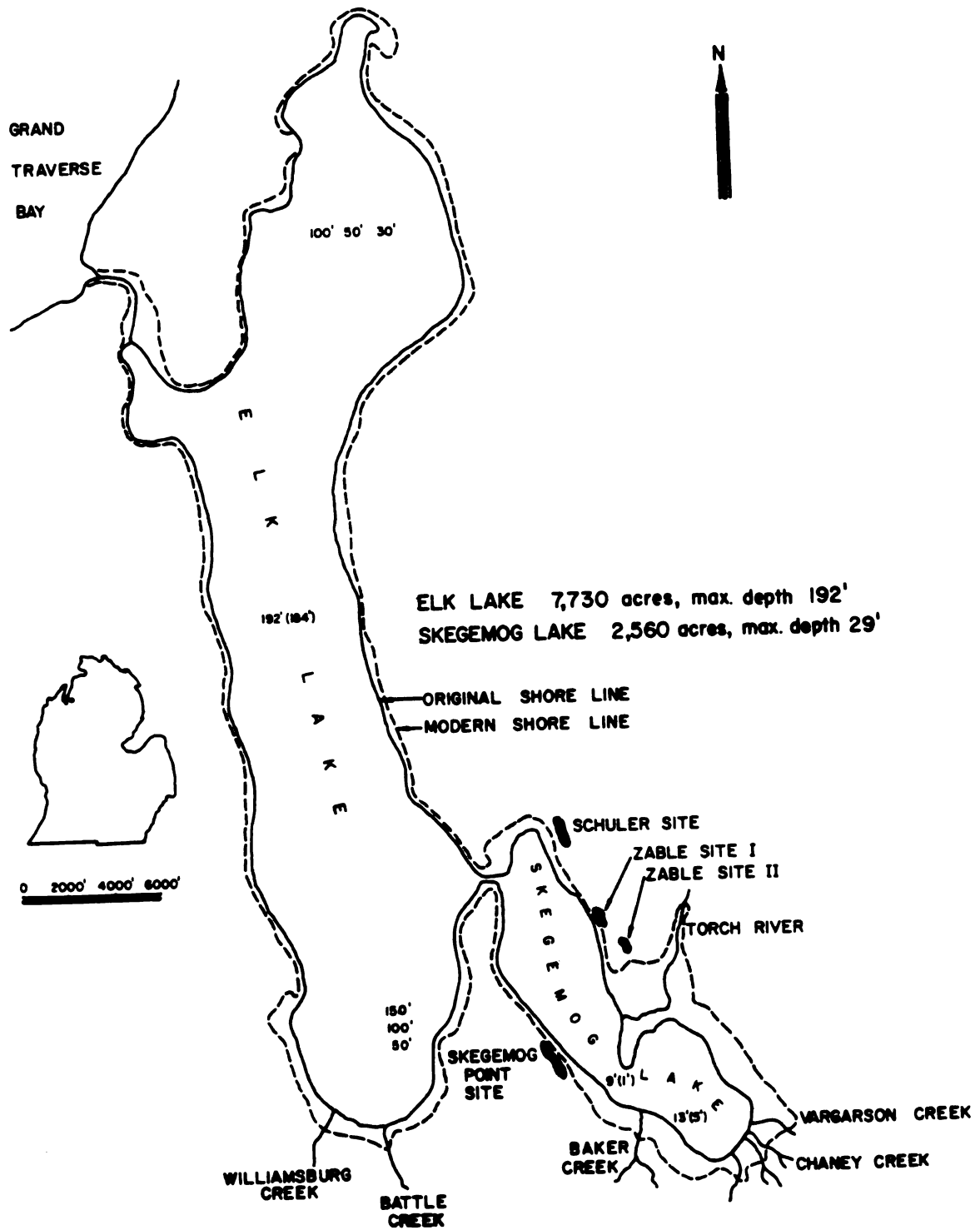


Figure 58. Location of the Skegemog Point Site

Frank Samels, R.F.D. Williamsburg, reports: 4 mounds, on Lot 2, Section 24, Township 28, Whitewater Twp., Grand Traverse Co. These mounds were at the side of an Indian trail, called the Saginaw Trail. This trail came across Samels' farm, crossing the lake at "The Narrows". Two of the mounds on one side of the trail and 2 on the other ... Bones found in the mounds years ago. On the same site as these mounds is a camp site and pits on Round Lake [Lake Skegemog] ... 30 to 36 pits ... Mr. [Frank] Samels found pieces of pottery in the bottom of a pit he was enlarging for the purpose of burying a horse ... Mr. Samels also has a small collection: a copper arrow, a copper chisel, flint arrows, scrapers, a grooved axe, etc. ... Mounds have been ploughed over, had been dug into and bones left out on the surface, Mr. Samels reburied the bones ... Small mound on the SW1/4 of the SW1/4 of Sec. 24 and near it 2 pits. On the land owned by Mr. Watson, across road from Mr. Samels.

Although the actual presence of burial mounds on the peninsula has been questioned (Cleland, personal communication 1988), the above statements clearly indicate that the Skegemog Point site was recognized as a locale of substantial and extensive prehistoric occupation by at least the early part of this century.

Tantalizing as this information is, the site fell into archaeological obscurity. During the middle third of this century, the focus of archaeological activities, professional and nonprofessional alike was the more visible mound and earthworks found throughout the state (Butterfield et al. 1955; Gillis 1960; Greenman 1927a, 1927b; Hinsdale 1924, 1929, 1930; Prah 1970). This emphasis was, in part, fueled by the spectacular finds occurring in the mound excavations further south in the Scioto Valley of Ohio.

As part of a much broader research project investigating the relationships between the prehistoric cultures of Michigan and the environment (Cleland 1967a, 1967b; Fitting 1966a), archaeological field teams directed by Charles E. Cleland, Michigan State University and Elizabeth A. Baldwin, Western Michigan University performed survey and testing operations at a number of sites in a four county area of northwestern Michigan. The initial focus of this research project was test excavations the Aetna I, Aetna II, and Boven earthworks in Missaukee County. Funding for the 1965 field season was provided through a Michigan State University Breakthrough Research Grant (Cleland n.d.a.).

As part of the site survey program, an advance survey team visited the Skegemog Point site on July 8, 1965. After a second visit to the site, which Cleland (1965) described as "one of the richest village sites I have ever seen." On July 10, 1965 permission to excavate on the northern portion of the site was granted by the Waggoner and Bowerman families. The focus of field operations shifted almost immediately to the

Skegemog Point site. By late July permission to excavate further south had been obtained from the Samels brothers, granting access to the full extent of the site.

Although limited in time and extent, the 1965 testing of the Skegemog Point site clearly indicated its potential to provide information concerning the prehistoric adaptations in northwestern Michigan. Following up on this work, Cleland submitted a proposal to the National Science Foundation to fund work for the 1966 field season. Two questions formed the basis of this proposal (Cleland 1966b:2). The first relates to the nature of the adaptations to the discrete ecological zones located around the southern end of Grand Traverse Bay and the effect of climate and cultural changes on these adaptations. The second question examined the manner in which the adaptations to these ecological zones affected population distribution and movements. With funding obtained under this grant, joint field crews from Michigan State University and Western Michigan University returned to the Skegemog Point site for an additional approximate 10 weeks of excavations. These excavation further explored the Late Woodland occupation area and tested the area containing the Early Archaic occupation. The 1966 field season also included survey of the surrounding area. This resulted in the identification of a number of additional Archaic and Woodland period sites.

Preliminary analysis and curation of the collection from the Skegemog Point site took place at the Michigan State University Museum. Portions of the analysis were funded through a National Science Foundation Undergraduate Research Participation Grant. Preliminary consideration of the excavation units, lithic, ceramic and faunal remains from the site was summarized by Cleland (n.d.a.). Initial identification of select floral remains was conducted by Nancy Nowak and an examination of the fish scales was conducted by Dr. Michael Ovchynnyk, Michigan State University Museum. A number of other research papers examined the geomorphology of the Skegemog Point area (Canouts n.d.), the local climate (Wagner 1967), and the presettlement forest communities in northwestern Michigan (Isleib n.d.). These works provide a foundation for the consideration of the archaeological remains at the Skegemog Point site conducted in this dissertation.

SITE PHYSIOGRAPHY

A series of natural and cultural features act to form the boundaries and physical configuration of the site. The physiography of the peninsula and the site area itself is dominated by a series roughly north to northwest trending post-glacial beach ridges. The Late Woodland occupation at the site lies along a slightly uplifted, poorly defined Algoma stage beach ridge and an uplifted, well defined Nipissing age beach ridge whose elevation has been measured at 613.2 feet a.m.s.l. (Canouts n.d.). A small swale separates this beach from what has been identified as an Upper Group Algonquin age beach ridge sitting at an elevation of 621.9 feet a.m.s.l. (Canouts n.d.). The Nipissing age beach also plugs an erosional gully in the Upper Group Algonquin beach. The bulk of the Early Archaic occupation at the site along with minor amounts of Late Woodland material are located on this second beach ridge. A third beach ridge was

identified at 635.9 feet a.m.s.l. It too has been identified as Algonquin in age (Canouts n.d.). No occupational evidence was noted for this latter beach ridge.

Covering approximately 15 acres, the archaeological deposits at Skegemog Point stretch across three separate property lots. The northern third of the site lies on the property of Mr. and Mrs. Bud Waggoner and Mr. and Mrs. Robert Bowerman. The southern two-thirds of the site lies on the property of Ben, Bob, and Dennis Samels (Cleland n.d.a.).

The physical boundaries of the site may be defined as follows. To the east the site is bounded by the waters of Lake Skegemog. It should be noted that the modern level of Lake Skegemog and Elk Lake is controlled by a dam at Elk Rapids constructed around 1850 (Cleland n.d.a.). Construction of the dam is responsible for an approximate 10 foot increase in the depth of the two lakes, partially inundating the eastern fringe of the Late Woodland occupation (Canouts n.d.; Cleland n.d.a.). This rise in lake level also effectively drowned the modern or post-Algoma beach in the vicinity of the Skegemog Point site. The northern boundary of the site is effectively formed by the northern limits of the Bowerman's property. The lots to the north of this were heavily disturbed by the time of the excavations. The extent to which the site continued northward is unclear. The southern boundary of the site coincides with the southern boundary of the Samels brothers' property. Baldwin (1965) noted in her field notes that surface collections of the properties south of this point produced only a single projectile point from three farms to the south. The western boundary of the entire site is approximated by the western edge of the Upper Group Algonquin beach, while the western limits of the Late Woodland occupation roughly coincides with the western edge of the Nipissing age beach ridge.

A series of disturbances are immediately apparent at the site. Primary among these are the Bowerman and Waggoner homes and the driveway leading into them. There is also a series of three small cottages forming a now defunct summer resort run by the Bowermans. Modern disturbances on the southern two-thirds of the site is largely limited to plowing west of the fence line indicated on Figure 59. The Samels landing area also exhibits evidence of disturbance, some of which is the product of lumbering activities in the nineteenth century (Cleland n.d.a.).

At the time of the excavation the area containing the Late Woodland occupation was covered with mature second growth forest. The composition of this forest was quite diverse containing primarily hemlock (Tsuga canadensis) and white pine (Pinus strobus). Lesser amounts of red oak (Quercus rubrum), swamp white oak (Quercus bicolor), beech (Fagus grandifolios), sugar maple (Acer saccharum), elm (Vulmus americana), basswood (Tilia americana), yellow birch (Betula lutea), and northern white cedar (Thuja occidentalis) in low lying areas near the lake are also present (Cleland n.d.a.). Two free flowing springs are also present on the Samels property; one near the modern lake shore and a second one in the lake, approximately five feet from the current shore (Cleland n.d.a.).

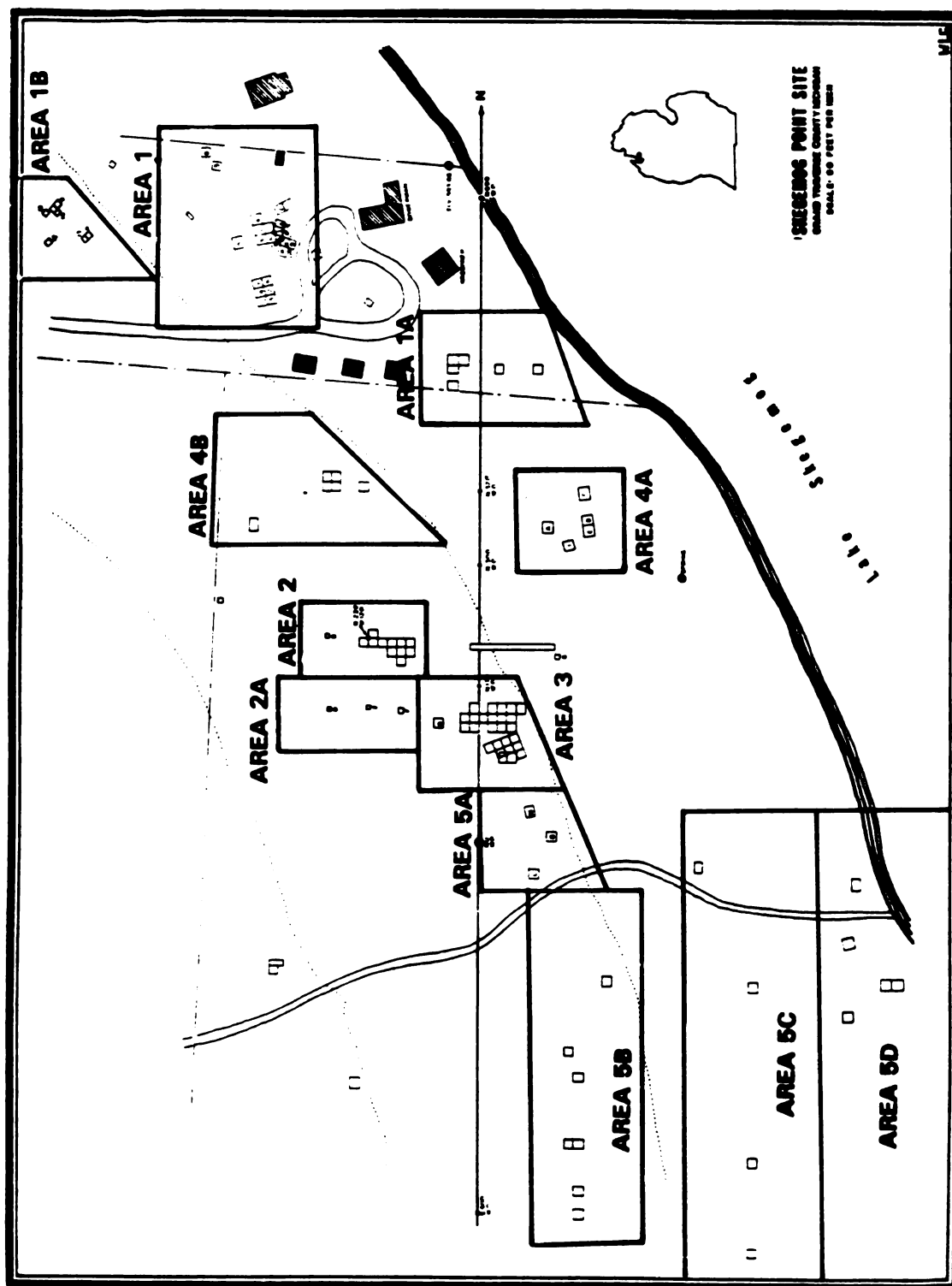


Figure 58. Location of the Skegemog Point Site

Figure 59. Location of Excavation Units at the Skegemog Point Site

EXCAVATION METHODS AND UNITS

Over the course of two summers of field work approximately 10,000 square feet of excavation was accomplished at both the Skegemog Point and Samels Field localities. This section describes the methods employed, the extent and structure of the excavation blocks and test units, and the stratigraphy of the site. Although excavation techniques were uniform for both areas, this report details only those excavation areas associated with the Late Woodland occupation. The location of these excavation units is illustrated in Figure 59.

Initial excavations during the summer of 1965 were oriented towards identifying site limits and broadly exploring the internal structure of the site. To this end, a series of 10X10 and 5X5 excavation units were judgmentally placed across the site (Cleland n.d.a.). A majority of the test units excavated in 1965 are located in the northern third of the site. The information obtained from these units were then used to formulate the research questions to be addressed the following summer. During the summer of 1966 a site datum and orthogonal grid were formally established for the site (Cleland n.d.a.). Excavation units from the previous summer were tied into this grid and an overall site map was made. In contrast to the previous summer, most of the excavation took place on the Samels' property in 1966.

All excavation units were hand excavated with trowels and shovels in 0.3 ft arbitrary levels. The excavated soil was passed through quarter inch hardware cloth and all remaining artifactual material was bagged according to unit number and any relevant internal subdivision. Initially, a number of the units were subdivided and excavated by quadrants and some piece plotting of artifacts was undertaken. This practice, however, was abandoned the following summer in favor of exposing large expanses of ground in order to obtain settlement and subsistence information. To maintain a degree of uniformity in the size of the analytic units employed for this analysis, the 10X10 excavation unit is used as the primary level of provenience. The added information provided by the subdivided units and the piece plotting is utilized whenever possible. Soil samples were collected from a number of feature contexts and general excavation levels were also collected and subjected to flotation.

Before turning to the discussion of excavation unit locations, description of the soils present at the site is helpful since there is no culturally induced stratigraphy. The predominant soil type present on the site is Kalkaska loamy sand ranging from 0 to 6 percent slope (Weber et al 1990). The following description is summarized from Weber et al (1990:22). These soils typically display several inches of recent and partially decomposed organic matter at the top of the profile. The A horizon usually exhibits two subdivisions. The upper portion of the A horizon consists of very dark gray (10YR3/1) to dark grayish brown (10YR4/2) fine, granular, very friable, loamy sand. This zone is typically up to six inches thick. Underlying this zone is the A2 horizon. It is generally only several inches thick, although it may range up to eight inches thick. This zone consists of grayish brown (10YR5/2) loose, fine sand with an abrupt, irregular lower

boundary. The B2 horizon is typically dark reddish brown (10YR3/2) loamy sand with a weak, coarse, subangular blocky structure which grades into a dark brown to brown (7.5YR4/4) loose sand below a depth of 8 to 16 inches. A dark yellowish brown (10YR4/4) loose sand up to 14 inches thick forms the B3 horizon. Pale-brown (10YR6/3) gravelly sand comprises the parent material for Kalkaska loamy sand and it is generally present by a depth of three feet below ground surface. A typical soil profile for the site is illustrated in Figure 60.

The archaeological remains are largely restricted to the upper portion of this soil profile, specifically the upper 12 to 18 inches (Cleland n.d.a.). The bulk of the artifactual remains occurs within the A soil horizon. This corresponds to excavation levels 1 and 2 which extend to 0.6 feet below ground surface (Cleland n.d.a.). Because of the dark color of the upper two levels, definition of feature limits generally was not possible until Level 3 (0.6 to 0.9 feet). The occurrence of artifacts in this level is generally restricted to the feature limits (Cleland n.d.a.). Excavation level 4 is generally devoid of artifacts, although some feature bases did penetrate this level (Cleland n.d.a.). Difficulty in the definition of feature limits and activity areas was further compounded by "the labyrinth of old and modern root channels and the frequent rodent disturbances" (Cleland n.d.a.).

A total of 115 excavation units and a stratigraphic profile trench were excavated in the Late Woodland occupation area. These have been arbitrarily grouped into a series of spatial subdivisions for the purposes of summarizing their location and content at the site. These become the basis of the spatial information for addressing questions concerning the extent of the site, the distribution of the various artifact classes across the site, and the interrelationships among the artifact groups as it relates to the changing structure and function of the site through time.

As pointed out by Cleland (n.d.a.) the lack of vertical stratigraphy at the site dictated an excavation strategy oriented towards the excavation of units which would allow the consideration of the horizontal distribution of features and artifacts across the site. The placement of the excavation blocks was based upon information obtained during the preliminary testing of the site. It was felt that by placing these excavation blocks in areas of relatively high densities of material, a much better understanding of the internal dynamics of the site would be obtained than by spatially discrete, individual excavation units (Cleland n.d.a.).

In the ensuing discussion and throughout this study excavation units are referred to by their primary catalog number, rather than by their field designation or the sequential numbering system instituted during the preliminary analysis. The catalog numbers for the excavation units are listed in Table 30.

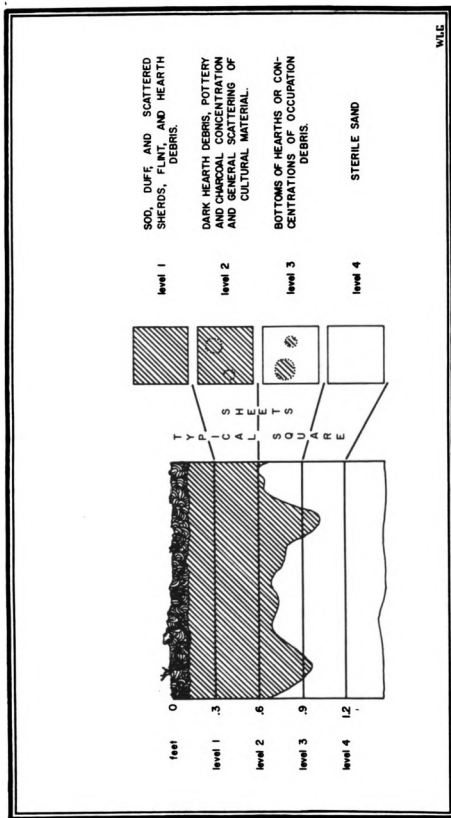


Figure 60. Typical Stratigraphic Profile at the Skegemog Point Site

Table 30. Excavation Unit Catalog Numbers

CATALOG NUMBER	AREA	UNIT
1	1	1
2	1	2
3	1	3
4	1	4
5	1	5
6	1	6
7	1	7
8	1	Test Pit A
9	1B	Test Pit 1
10	1B	Test Pit 2
11	1B	Test Pit 3
12	1B	Test pit 4
13	1B	Test Pit 5
14	1B	Test Pit 6
15	1B	Test Pit 7
16	NA	Surface
17	NA	Surface
18	NA	Surface
19	1A	S0 E10
20	1A	S10 E90
21	1A	S10 E50
22	1A	S0 E0
23	1A	S30 E10
24	NA	Test 1965
25	NA	A
26	5D	B
27	4A	C
28	4A	D
29	4A	E
30	5D	F
31	5D	G
32	5D	H
33	5D	I
34	5D	J
35	5D	K
36	5A	L
37	5A	M
38	3	N
39	3	O
40	3	P

Table 30 (cont'd).

CATALOG NUMBER	AREA	UNIT
41	3	Q AND N
42	3	Q
43	3	R
44	3	S
45	3	T
46	3	U
47	1A	S10 E0
48	3	V
49	NA	No Unit
50	1	W-1-66
51	1	W-2-66
52	1	W-3-66
53	1	W-4-66
54	1	W-5-66
55	3	N90 E20
56	3	N90 E30
57	1	W-6-66
58	3	N120 W10
59	3	N130 W10
60	3	N130 W0
61	1	W-7-66
62	3	N130 E10
63	NA	Deleted
64	3	N140 W10
65	3	N130 E10
66	NA	Test B-66
67	NA	Test Pit
68	3	N120 E20
69	3	N140 E20
70	3	N130 E20
71	3	N140 E10
72	NA	N380 W170
73	NA	Surface
74	3	N120 E30
75	3	N380 W160
76	NA	N130 E30
77	1	Feature 1
78	2A	Test Pit D
79	NA	Deleted
80	2A	Test Pit E

Table 30 (cont'd).

CATALOG NUMBER	AREA	UNIT
81	NA	N390 W170
82	1	W-10-66
83	1	W-8-66
84	1	W-9-66
85	Prof. Tr.	Test Pit G
86	NA	Test Pit
87	2A	Test Pit F
88	NA	N210 E20
89	NA	N210 E40
90	NA	N210 W0
91	3	N130 E10
92	2A	N130 W170
93	NA	N380 W130
96	1	B-1-66
97	1	B-2-66
98	NA	N210 E30
99	NA	N210 E10
100	NA	N210 E0
101	NA	N210 W10
102	NA	N380 W160
103	NA	N390 W170
104	NA	N390 W160
105	NA	N200 E80
106	A	B-3-66
139	3	N140 E30
144	5D	Landing
145	3	N130 W20
146	3	N120 W20
147	3	N140 E40
153	2	N220 W120
154	2	N210 W110
155	2	N210 W120
156	1	W-11-66
161	2	N200 W90
162	2	F10-66
163	2	N200 W100
164	2	N210 W100
165	2	N210 W130
171	2	N210 W80
172	2	N210 W90
174	2	N200 W80

Table 30 (cont'd).

CATALOG NUMBER	AREA	UNIT
175	2	N200 W100
176	2	N220 W90
177	2	N220 W95
178	2	N220 W85
179	NA	Food Pit 1
180	1	W-12-66
181	5C	S150 E290
182	5C	S30 E230
183	5B	S230 E90
184	5B	S260 E100
185	NA	S150 E130
186	5B	S330 E90
187	2	Area Edge
188	NA	S385 E100
189	5C	S350 E290
190	5B	S410 E100
191	5B	Feature 5
192	5C	S450 E290
193	NA	S450 E290
194	5C	S150 E290
195	3	N130 E30
196	3	Feature 2
197	NA	Surface
198	NA	Dekin
199	NA	Wag. 5X5
200	NA	Norton's

AREA 1

Area 1 consists of a cluster of 20 10X10 and three 5X10 excavation units located just west of the Bowerman's driveway (Figures 59 and 61). Internally, the excavation units comprising this area form two blocks of contiguous excavation and several peripheral test units. Most of the units form a central block exposing slightly over 900 square feet of area. A second contiguous block of six units in Area 1 lie slightly to the south of the first block, exposing 600 square feet of area. The changing orientation and overlap of some of the units in Area 1 is a result of the grid imposed on the site in 1966. An additional six individual 10X10 units complete Area 1. It should be noted that Units 6 and 108 are located between 60 to 90 feet north of the other units in Area 1. These two units lie closest to the units forming the core of Area 1. They also exhibit relatively high artifact densities.

The modal depth of excavation in Area 1 is 0.9 feet, although several of the units were excavated to a depth of between 1.2 and 1.5 feet. This was sufficient to expose the features present in this part of the site as well as recover all extant artifactual remains.

Not only did this group of units contain some of the highest artifact densities, but it also exhibits some of the densest concentrations of features and post molds recovered in any of the excavations at the site. All of the features present in this area consist of shallow hearths, with several exceptions. These exceptions consist of clay deposits. Individual features are summarized in Table 31 and discussed below.

Cleland (n.d.a.) notes that the hearths in this part of the site are generally between one and three feet in diameter and no more than 1.5 feet in depth. As can be seen in Figure 61, the hearths occur in amongst a morass of post molds and natural gravel concentrations. Interestingly, it was noted that the unmodified beach cobbles did not occur within or immediately adjacent to the features themselves (Cleland n.d.a.). It is unclear whether this is a result of intentional clearing of the hearth area. The distribution of features within the central portion of Area 1 is nearly uniform, with a very slight clustering of features along the western and southern edges of this group of excavation units.

Post molds are reported to have averaged 0.2 foot in diameter and rarely exceeded one foot in depth (Cleland n.d.a.). Although no clear patterns could be discerned among the post molds, it was suggested that they are most likely associated with circular rather than linear shaped structures.

Only two features, both hearths, were delineated in the southern group of six units in Area 1. The size of the larger of the two hearths appears to have been increased by the presence of a burned out tree stump over top of it (Cleland n.d.a.). The density of post molds in this part of Area 1 is relatively low, as was the amount of unmodified beach cobbles.

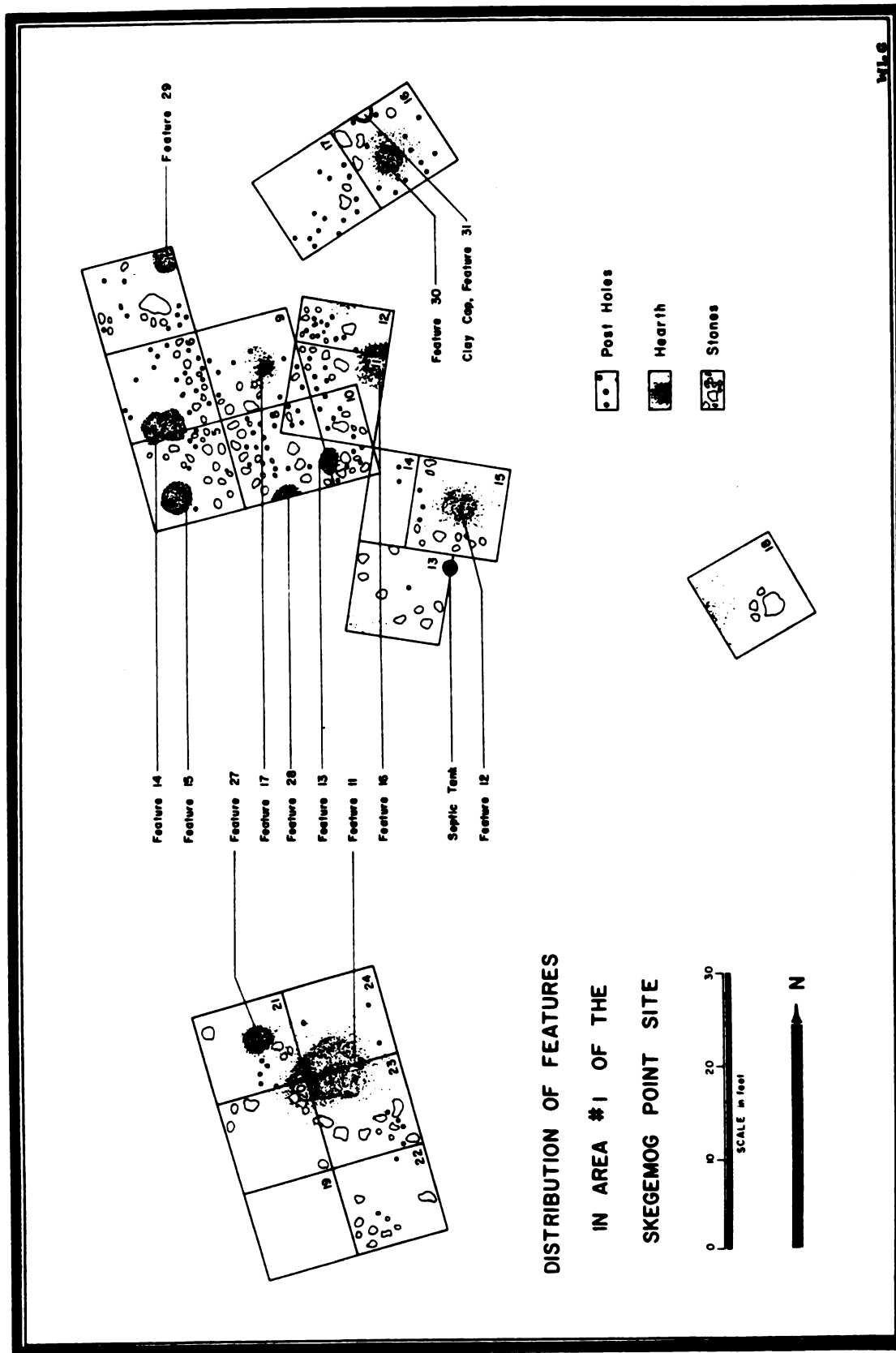


Figure 61. Map of Area 1

Table 31. 'Feature Summary for the Skegemog Point Site

FEATURE	UNIT NUMBER	TYPE	LENGTH m	WIDTH m	DEPTH m
1	42/41	Hearth	0.61	0.97	0.40
2	58/59	Hearth	1.20	1.40	0.40
3	40	Hearth	1.20	3.10	0.45
4	38/42	Hearth	1.76	0.12	0.24
5	40	Hearth	0.37	0.46	0.55
6	154	Hearth	0.76	0.91	0.24
7	172	Hearth	1.00	0.01	0.27
8	164/172	Hearth	1.50	0.73	0.30
9	163	Hearth	0.61	0.76	0.40
10	162	Hearth	1.20	0.76	0.46
11	77	Hearth	1.52	1.52	0.61
12	84	Hearth	1.25	1.52	0.37
13	6/7	Hearth	0.61	0.61	0.40
14	2	Hearth	0.76	0.98	0.43
15	3	Hearth	0.30	0.30	0.18
16	156/180	Hearth	0.91	1.22	0.30
17	1	Hearth	0.27	0.24	0.24
18	28/29	Hearth	1.52	1.52	0.76
19	19	Pothole	0.91	1.22	NA
20	75/72	Hearth	NA	NA	0.06
21	40	Clay Dome	1.52	1.52	0.27
22	44	Clay Dome	1.52	1.52	0.27
23	155/165	Hearth	1.00	1.16	0.24
24	161/172	Hearth	0.73	0.91	0.18
25	176/161	Hearth	0.30	0.37	0.37
26	171	Hearth	0.98	1.10	0.27
27	61	Hearth	0.91	0.91	0.30
28	6	Hearth	0.30	3.00	0.49
29	4	Hearth	0.43	0.46	0.46
30	96	Hearth	0.46	0.43	0.43
31	96	Clay Dome	0.30	0.30	0.30
32	60/62	Hearth	0.61	0.76	0.76

Although only two hearths are present in contiguous Units 96 and 97, a relatively high density of post molds are present. These units most likely represent a continuation of the patterns seen in the central portion of Area 1.

Unit 50 exposed the edge of a hearth. No post molds were recorded in this unit. No features, post molds, artifact or rock concentrations were recorded in Unit 5.

As may be expected from examination of the map for Area 1, several adjustments were necessary for the spatial analysis of the site. This relates primarily to the overlapping excavation units in the central part of Area 1. Unit 156 largely overlies previously excavated Unit 7, and to a much lesser degree, Unit 6. Although not square, Units 156 and 7 total 97.25 square feet in area. This creates a square footage figure not significantly different from the size of the Primary spatial unit (i.e., 10X10 square or 100 square feet). This allowed incorporation of the data from these units in the spatial analysis. A second situation required monitoring in the spatial analysis for which no control could be exerted. This concerns Unit 52. The card catalog for this unit notes that the materials from Level 2 never returned from the field. As such this unit will automatically be predisposed to show a low density of material. After careful consideration it was decided to leave this unit in the sample to maximize the information available for this part of the site. The potential effect of this on the statistical analysis had to be constantly monitored.

AREA 1A

Area 1A consists of a loose cluster of seven 10X10 excavation units located between the old resort cottages and the shore of Lake Skegemog (Figure 59). Only three units are contiguous, although a fourth unit lies approximately five feet south and may be considered part of that group of units. The remaining units comprising this area are scattered between the contiguous units and the lake shore. Together, this area exposed 700 square feet of area.

The modal depth of excavation was 0.9 feet in this area of the site. The two units closest to the lake shore (Units 20 and 24) were only excavated to the base of Level 1 due to low artifact densities. In fact, Unit 24 was sterile. The artifact density in Unit 21 is also very low. Baldwin (1965) indicates in her field notes that the unit has been disturbed by a bulldozer and that the soils may be characterized as "swamp muck." In contrast, Units 19, 22, 23, and 47 exhibit moderate to high densities of material.

A number of poorly defined burned areas and a small number of post molds were defined in the western group of four units in this area. A small area of burned soil was defined along the west central wall of Unit 23 at the base of Level 2. The burned zone extends into Level 3.

In Unit 47 a series of six scattered post molds were mapped in Level 3 of the northwest quadrant of the unit. They did not form an interpretable pattern. A large

concentration of rocks was observed in the southeast half of the of the southeast quadrant of the unit. Piece plotting of artifacts in this unit indicate that the majority of the material was recovered from the northern two-thirds of the unit. Several small, scattered areas of burned soil were recorded along the west edge of the unit. Although amorphous and shifting, these zones extend from Level 1 into Level 3. Furthermore, two small concentrations of rock were recorded; one in the southwest corner and one along the west central wall of the unit. A line of six or seven post molds trending in a northwest-southeast direction were mapped in the central third of the unit in Level 3. Interestingly, a zone of clay was mapped on the south side of these post molds. An association between possible structures and clay "domes" is noted in Area 3 (Cleland n.d.a.)

It should also be noted that this group of units contained a fair amount of historic debris, primarily in the form of nails and other fastening hardware. Most of this material occurs at relatively shallow depths. While the integrity of the prehistoric deposits in this area have certainly been impacted, the severity of that impact does not appear to be great.

AREA 1B

Area 1B consists of a cluster of seven 5X5 excavation units located on the Nipissing beach ridge in the northwest corner of the site (Figure 59). These units were among the first to be excavated at the site in 1965. The overall density of material in this part of the site is very low, consisting primarily of lithic remains. The presence of a relatively small amount of ceramics, however, do clearly place the occupation in this area of the site within the Late Woodland period. No features, post molds, or artifact concentrations were recorded for the units in this area.

AREA 2

Area 2 consists of a contiguous block of 12 10X10 units and a single 5X10 unit. It is located near the center of the Nipissing age beach ridge on the Samels' property (Figures 59 and 62). Thus, a total of 1,250 square feet of area were exposed in Area 2. The long axis of the excavation block is oriented east-west. The eastern 30 feet of the excavation block contains a majority of the features recovered here and contained the densest amount of materials (Cleland n.d.a.). Once again, the modal depth of excavation is 0.9 ft. Cleland (n.d.a.), however, notes that the deposits in Area 2 were slightly shallower than in Area 1.

Again nearly all of the features recorded in this excavation area consist of hearths (Figure 62). The only apparent exception is Feature 8 located in the northwest corner of Unit 172 and the northeast corner of Unit 164. This feature is described as a shallow basin lacking any evidence of burning normally associated with a hearth (Cleland n.d.a.). The features recovered from Area 2 are listed in Table 31.

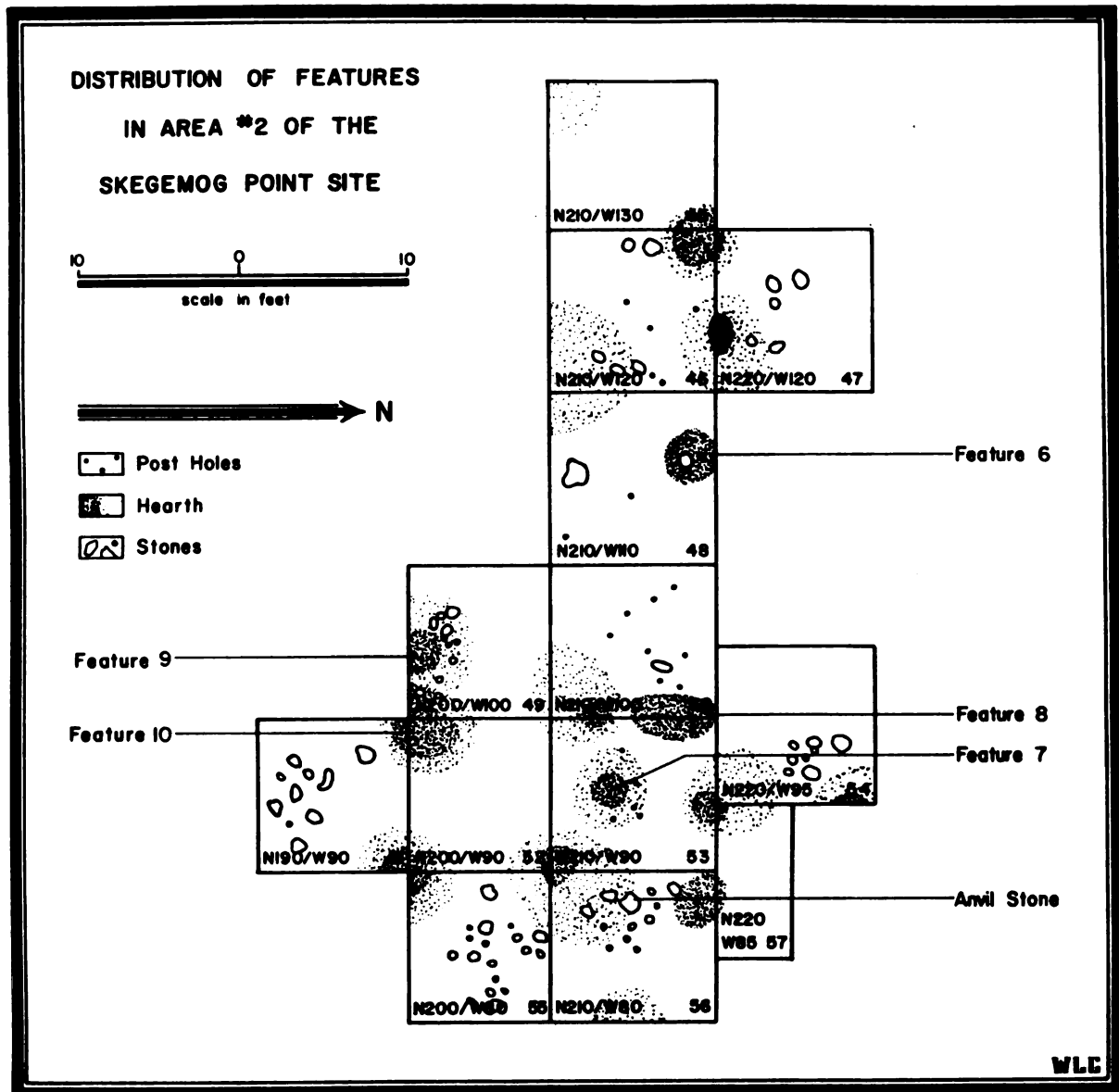


Figure 62. Map of Area 2

Post molds are extremely limited in number and widely scattered across Area 2 (Figure 62). The densest concentration of post molds in Area 2, if it may be called that, occurs in Unit 164, west of the features present in the unit. This concentration consists of only eight post molds. Other than a line of four post molds in Unit 164, no patterning of the post molds in Area 2 could be ascertained.

The amount of rocks present in Area 2 was also noted to be much lower than in Area 1 (Cleland n.d.a.). This is not considered to be a product of cultural factors.

AREA 2A

Area 2A consists of a series of four 5X5 test units and a single 10X10 excavation unit (Figure 59). No features, post molds or artifact concentrations are indicated among the records for these excavation units. The 5X5 test units were typically excavated to the base of Level 1, except for Unit 66 which was excavated to the base of Level 3. In this latter unit, only one artifact per level is recorded for Levels 2 and 3. The 10X10 unit was also excavated to the base of Level 3. Interestingly, the 5X5 test units exhibit very low artifact densities and extremely low densities of ceramics. On the other hand, Unit 92 exhibits an overall artifact density more in line with those recorded for Areas 2 and 3. Although the actual ramifications of these general density distributions is not totally clear, it is possible that they indicate an area of limited use south of Area 2 and west of Area 3. Unit 92, therefore, may indicate the presence of a spatially discrete area of occupation which was not extensively tested.

AREA 3

Area 3 is the largest block of contiguous excavation units at the site. This area is located on the eastern edge of the Nipissing age beach ridge, 40 feet south and 50 feet east of Area 2 (Figures 59 and 63). A total of 27 10X10 excavation units comprise this area, exposing a total of 2,700 square feet. The long axis of this area is also oriented in an east/west direction. The excavation units comprising Area 3 are mostly contiguous with one another. There are several exceptions, however. First, Unit 39 is an individual 10X10 unit located 20 feet west of the west of Units 145 and 146. The second discontinuity occurs between the main part of the excavation block and a group of eight 10X10 units oriented approximately 25 degrees south of East. This latter group of units were excavated in 1965 before the establishment of a formal grid system. These units are also bounded on the south side by Units 55 and 56. The continued excavation in Area 3 was designed to intercept the 1965 excavations and expand the information base for this particularly rich portion of the site.

Based on the distribution of features and artifacts within this excavation block Cleland (n.d.a.) describes the nature of the occupation uncovered here as "an extensive occupation although not an intensive one" .. "especially in the eastern portion near the crest of the Nipissing beach". Cultural features are primarily hearths, which tend to be more spatially separated from one another in Area 3 than in any of the other major

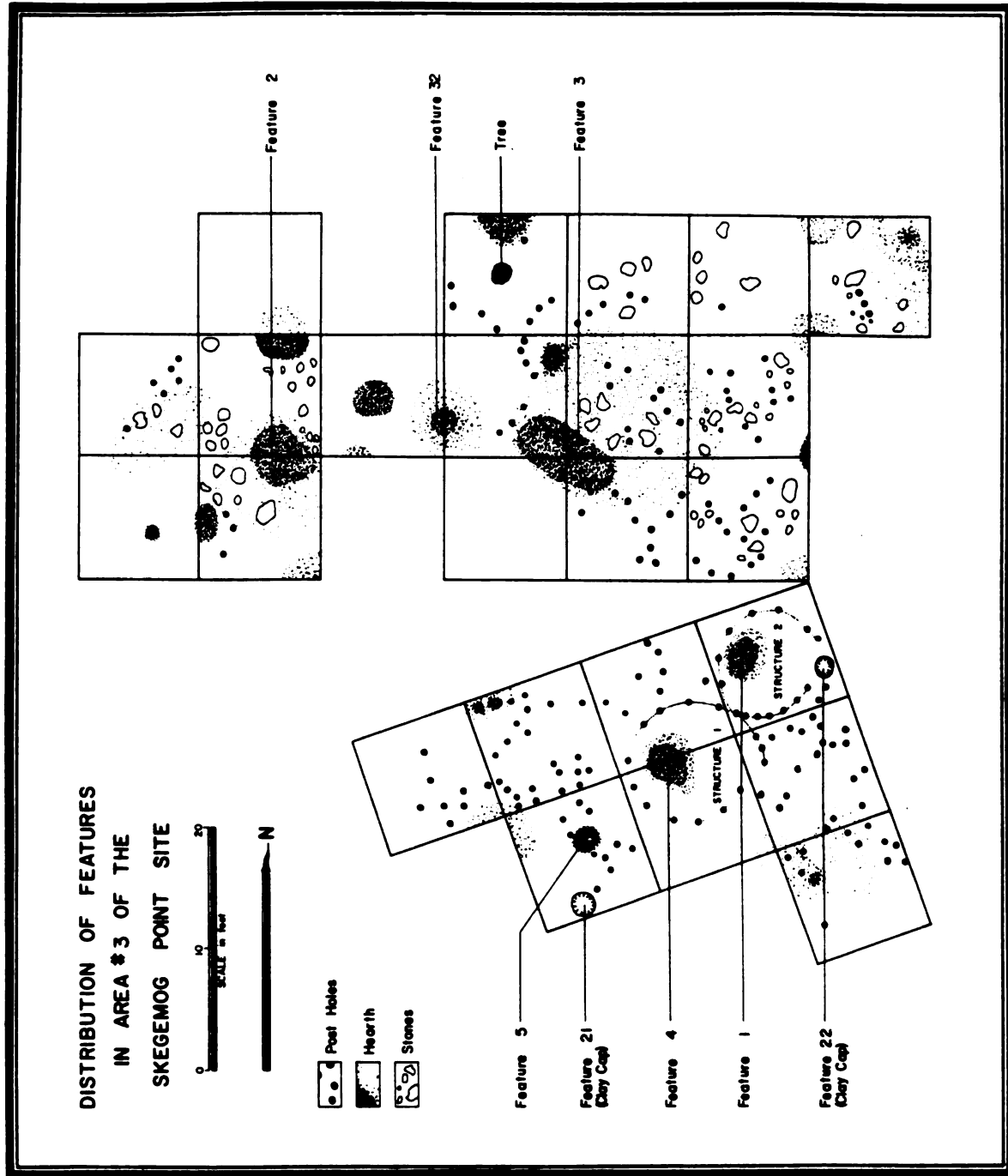


Figure 63. Map of Area 3

excavation blocks (Figure 63). Hearths once again dominate the feature inventory. In the northern part of Area 3 excavated in 1966 the dominate feature is a large hearth (Catalog Number 91) located at the junction of Units 62, 65, 68, and 70. Cleland (n.d.a.) reports that this roughly coincides with the location of the major artifact concentration in this excavation area. East of this feature a number of other, much more diffuse hearths occur along the edge of the excavation block. A small cluster of small and medium sized hearths are present in the western two to three tiers of excavation units. All of the hearths are described as shallow in depth (Cleland n.d.a.).

The group of units in Area 3 excavated in 1965 also contain a low density of widely scattered hearths of varying degrees of clarity in their definition (Figure 63). The only two atypical features in Area 3 were recorded in Units 40 and 44. These are both described as small clay caps or domes measuring two feet in diameter and one foot in height (Cleland n.d.a.). While these features do not resemble the other hearths at the site and the clay itself does not appear to have been fired, the presence of burned sand in the clay matrix suggested to Cleland (n.d.a.) that they were hearth related features; possibly designed to reflect a greater amount of heat than the typical surface hearth.

A great number of post molds were exposed in the eastern two-thirds of the northern portion of Area 3. The southern portion of the excavation block also exhibits high densities of post molds (Figure 63). From this cluster of post molds Cleland (n.d.a.) identified the only good candidates for structures at the site. They are small circular structures with internal hearths. Although not clearly defined, a potential third structure has been identified using the large hearth in the 1966 excavation area as a reference point.

Units 55 and 56 are somewhat problematic. The extant records for these two units indicate that only the first level was excavated in Unit 56. It is unclear whether the base of the artifact bearing deposits were reached in this unit. Thus, the potential effect of this factor in the analysis of the structure of Area 3 had to be monitored. No records or artifacts from Unit 55 are present in the collection. This unit has been deleted from the analysis.

AREA 4A

Area 4A is another loose cluster of 5 10X10 excavation units, only two of which are contiguous (Figure 59). These units are located in the approximate center of the poorly defined Algoma age beach ridge. The units in this area were generally excavated to the base of Level 4. Unit 25 was excavated through Level 2. Only the first level was excavated in Unit 27. In general, artifact densities are moderate to low in this area. The only recorded feature in this area is a relatively large refuse pit located along the wall of the northwest quadrant of the southeast quadrant of Unit 27.

AREA 4B

Area 4B is made up of four contiguous 10X10 excavation units and a single 10X10 excavation unit located 20 feet east of the southeast unit in this block (Figure 59). Although no features or post molds were noted in this excavation block, the general density of artifacts is high. Generally, two levels were excavated in these units. Only one level was excavated in Units 72 and 75/102. All artifact bearing deposits appear to have been excavated in this cluster of units.

Although located at some distance from the main group of units comprising Area 4B, Units 67 and 179 are included here for the purpose of discussion (Figure 59). Unit 179 is a 5X10 excavation unit centered on one of the cache pits present at the site. Unit 67, on the other hand, is a 5X5 test pit located along the fence line between the Samels' woodlot and the Samels Field locale. This unit represents one of the western most occurrences of ceramics at the site. The only exception to this is a discrete concentration of ceramics recovered from the Early Archaic occupation area to the west. These units are not formally included in this analysis, although the large rim section recovered here were used in the ceramic classification.

AREA 5

This area consists of 19 10X10 excavation units located to the south of Area 3 (Figure 59). The units comprising this area were arbitrarily grouped into four subareas (A through D) based on their location in relation to aspects of site physiography. Thus, the units comprising Area 5A and 5B extend southward down the eastern portion of the Nipissing beach ridge. The four units comprising Area 5C extend down the center of the Algoma beach ridge, while the units comprising Area 5D are clustered in the landing area on the shore of Lake Skegemog. The placement of these units was based on a surface collection on the south side of the landing which produced a relatively large amount of material. As noted earlier, this area was disturbed by nineteenth century lumbering activities.

No features, post molds, or artifact concentrations were recorded in any of these units. As one proceeds south through this area the density of material decreases rapidly, effectively demarcating the southern boundary of the site.

FEATURES

A total of 32 features were formally defined in the excavated units at the Skegemog Point site. Virtually all of the recovered features consist of hearths. Additionally, three clay caps, two possible structures and a series of ceramic, lithic and rock concentrations were noted during the course of the excavation. These latter concentrations are not examined further. Features are summarized in Table 31 and located on Figures 61, 62, and 63. The ensuing summary of the features and structures from the site is largely derived from Cleland (n.d.a).

The hearths at the Skegemog point site typically have round to ovoid shapes with basin-shaped cross-sections. They are relatively shallow in depth. One feature, Feature 10, is described as having a truncated cone-shaped cross-section (Cleland n.d.a.). The long axis of the hearths is usually oriented in a general east-west direction. It was suggested that this is a product of the direction of the prevailing winds at the site at the time of occupation (Cleland n.d.a.). A correlation between the areas of the greatest artifact densities and the highest frequencies of hearth was also noted by Cleland (n.d.a.). The contents of the features typically consisted of a plethora of ceramics, lithics and charcoal.

One of the few non-hearth features excavated at the site is a cache or storage pit located in Unit 179 (Figure 59) in the southwest corner of Area 4B. This feature was indicated by a shallow surface depression approximately 1.8 m (6.0 ft) in diameter and 0.30 m (1.0 ft) deep. At least 36 of these shallow depression are reported in the early notes on the site when it was visited by Hinsdale's personnel (Vreeland 1924). Such concentration of cache pits occur widely in northern Michigan (Holman and Hambacher 1989) and are believed to have served as temporary storage structures. Typically they contain little or no artifactual remains hindering the ability to determine their function. Such is the case with the cache pit excavated at the Skegemog Point site. It did produce several body sherds assignable to Traverse ware, a single maul or pounding stone and a single grain of probable wild rice (cf. *Zizania aquatica*) (Egan, personal communication 1989).

The two structures identified at the site by Cleland (n.d.a.) are both located adjacent to one another in the southern portion of Area 3 (Figure 63). Both are circular in plan and are fairly small, measuring only about 3.5 m (10 ft) in diameter. The post molds associated with these structures measure 0.2 ft to 0.3 ft in diameter and were about 1.0 ft deep. It is presumed that they formed a wigwam-like structure (Cleland n.d.a.). The opening of both structures is described as oriented to the east, one of which appeared to have a wind baffle associated with it (Cleland n.d.a.). Basin shaped hearths were recorded near the rear walls of the structures and a small clay dome is associated with the entrance of Structure 2. Although small, the size of these structures does not appear to be inordinately small in comparison with other known examples of circular prehistoric domiciles in the northeastern United States. The possibility of other circular structures in Area 1 was also noted by Cleland (n.d.a.), but no convincing patterns could be isolated in the morass of overlapping lines and arcs of post molds.

RADIOCARBON DATES

A series of three radiocarbon dates are available from the Skegemog Point site. A fourth sample from the Samels Field locale is also discussed here since it relates to the Woodland period, rather than the Early Archaic period. These samples consist of field collected charcoal. The charcoal was specifically collected for the purpose of dating. Samples were submitted to the University of Michigan radiocarbon laboratory in September, 1966. Results were received from the University of Michigan the

following April and were reported by Crane and Griffin (1968). The dates as discussed in this section are listed as the uncorrected dates, the converted calendar dates, and the normalized dates as reported by the University of Michigan laboratory. The dates were also calibrated using the program developed by Stuiver and Becker (1986).

The first sample (M-1863) consisted of charcoal recovered from Feature 8 below the base of Level 3 in Unit 62. This is a large hearth dominating the central portion of Area 3 excavated in 1966. The reported date is 865 ± 120 radiocarbon years B.P. This date was converted to a calendar date of A.D. 1085 and a normalized date of A.D. 1210 by the University of Michigan laboratory. The more recent calibration program provides a date range between A.D. 1020 and A.D. 1280 with intercepts at A.D. 1164, 1169, and 1190. The ceramic evidence from Unit 62 and the surrounding units indicates that this area is associated with the Traverse phase occupation of the site.

The second sample (M-1864) consisted of charcoal collected from Feature 10, a hearth located in Unit 163 between the base of Level 1 and Level 3. This hearth is located in Area 2. The reported date is 630 ± 110 radiocarbon years B.P. This date was converted to a calendar date of A.D. 1320 and a normalized date of A.D. 1310 by the reporting laboratory. The more recent calibration program provides a date range between A.D. 1280 and A.D. 1420 with intercepts at A.D. 1304, 1371, and 1384. The ceramics from this part of the site are also largely associated with the Traverse phase occupation of the site.

The third sample (M-1865) was recovered from a hearth in the center of the north wall in Unit 58 (Area 3). The hearth was defined in Level 4. The reported date is 1100 ± 120 radiocarbon years B.P. This date was initially converted to a calendar date of A.D. 850. Two normalized dates of A.D. 900 and A.D. 950 ± 120 were also reported. The more recent calibration program provides a date range of between A.D. 777 and 793 and A.D. 800 and 1020 with intercepts at A.D. 777, 910, 915, 977, and 1020. Although the excavation unit from which this date was obtained contained approximately equal amounts of Traverse and Skegemog wares using the preliminary vessel count for the site, the date is presumably most closely associated with the Skegemog phase occupation of the site. Given the calibrated date range, this particular radiocarbon date may represent the transition from the Skegemog to the Traverse phase.

The fourth radiocarbon date (M-1868) was recovered from hearth 5-66 located in Unit N280 W681 in the Samels Field locale. The sample consisted of charcoal recovered from a hearth. The reported date is 1440 ± 120 radiocarbon years B.P. This date was initially converted to a calendar date of A.D. 510. No normalized date is recorded in the notes on file at the Michigan State University Museum. The more recent calibration program provides a calibrated date range between A.D. 434 and 451, A.D. 468 and 500, and A.D. 530 and 670 with intercepts at A.D. 434, 608, 627, 638, and 670. The only artifacts in the hearth were a small amount of undiagnostic chert

debitage. The excavation unit containing the feature also contained only a small amount of lithic debris.

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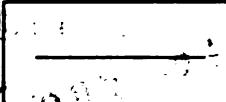
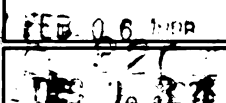
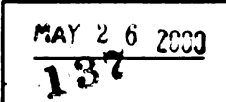
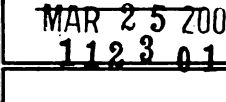
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APPENDIX 2

THE LITHIC ASSEMBLAGE FROM THE SKEGEMOG POINT SITE

INTRODUCTION

The analysis of the lithic assemblage from the Skegemog Point site focuses on a number of interrelated topics. Fundamental to the analysis is the classification of the assemblage and interpretation of the derived subsets. By systematically organizing the variation present in the lithic assemblage it is possible to address specific questions for each topic considered. It should be noted that the very nature of these questions helped to direct the structure of the classificatory system employed. The classification system employed, in turn, imposes structure on the body of data under examination.

The goals of the analysis are first to understand the overall structure of the lithic industry and reduction sequence as it is represented at the site. This includes comparisons with the growing body of literature concerning Late Woodland lithic industries in the region (Binford and Papworth 1967; Fitting 1967, 1968a; Holman 1978; Holman and Hambacher 1989; Lovis 1973; McPherron 1967). Second, the spatial distribution of the lithic assemblage is described in terms of the co-occurrence or co-variance of artifact classes. Co-varying artifacts are interpreted as representing either tool kits or activity sets. The relationship of these groupings with the ceramic assemblage and site structural features form the basis of the discussion in Chapter 4. A third goal is the isolation of changes in the nature of the lithic industry through time at the site. This information is used to monitor the type and range of activities carried out at the site through time. Broader issues of site function and evolution are also addressed.

CLASSIFICATION

A large and varied collection of lithic artifacts was recovered from the Skegemog Point site. The lithic assemblage is viewed as a primary constituent of the techno-economic subsystem at Skegemog Point. This subsystem was organized toward the production, use, and maintenance of tools. Therefore, its products and by-products were analyzed as a continuum. This continuum begins with the acquisition of unaltered

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pieces of raw material, extends through a series of manufacturing stages (i.e., reduction), use and reuse, and ends with discard.

Classification of the assemblage began by sorting it into three main classes; chipped stone tools, non-chipped or coarse stone tools, and lithic debitage. Internal subdivision of these groups is based upon aspects of morphology of the member specimens. A formally based approach (Stone 1974) to the classification was employed to rapidly organize the assemblage. This established morphologically consistent tool and debitage classes. Further, subdivisions within any given major category are hierarchically organized and based upon explicit criteria. This approach was also employed in the preliminary site report (Cleland n.d.a.). This facilitates comparison with other Late Woodland lithic industries within the region (Binford and Papworth 1963; Lovis 1973, Holman 1978; McPherron 1967). Functional inferences and assumptions were also drawn whenever possible.

Debitage, as the by-product of the manufacture and maintenance of stone tools, was classified to reflect the general stage of reduction from which it was derived. The condition of the striking platform, in addition to overall flake size and cross-section, served as the primary discriminating attributes. This reveals information regarding the chipping method employed, as well as the stage of removal.

Tools were also classified using primarily morphological attributes. Emphasis was placed on the configuration of the working edge(s) of the tool. The location and extent of the retouch also served as important discriminating attributes. The tool assemblage was ultimately partitioned into 25 types employing standard terminology. Further, these attributes were employed to separate the assemblage into other meaningful analytical categories. These included dichotomous groups of bifacial versus unifacial tools, and formal or curated versus expedient tools. Inferences concerning the functional role of the derived tool classes is noted where possible. Raw material types were recorded for tools and the chipping debris.

RAW MATERIAL

Identification of raw material types and their source areas has long been used as an indicator of the nature and intensity of the regional interaction among prehistoric populations (e.g., Streuver 1964; Winters 1968). The distribution of chert types used in Michigan during the Late Woodland period has been used to study interaction patterns by Luedtke (1976). This study also provides detailed descriptions of the chert types available in northern Michigan and provides a framework within which raw material type profiles may be interpreted.

Several factors limit the classification and interpretation of the various raw material types. First, a large proportion of the Skegemog Point assemblage is composed of a single type, Norwood chert. The primary outcrop of Norwood chert is located a

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short distance (circa 45 km) north of the site (Cleland 1973). Second, the other major bedrock sources of chert in this part of Michigan are located to the north in the Straits of Mackinac region (Luedtke 1976:187-188). This area was overridden by the Michigan lobe of Wisconsinan glaciation. The ice sheets transported these cherts over a wide area. The third limitation concerns the southern derived chert types, or rather, the general lack thereof. Luedtke (1976) indicates that only two southern derived cherts were used in northwestern Michigan during the Late Woodland period; Lambrix chert from central Oceana County and Bayport chert from the Saginaw Bay region. Both occur in only limited quantities on Late Woodland sites in northwestern Michigan (Luedtke 1976:343, 376).

Given these considerations, the chert types present at the Skegemog Point site were classified as either Norwood chert, glacial chert, or exotic/nonlocal cherts. The occurrence of thermal alteration was also recorded for each of the three chert groups.

The vast majority of the chert present among the debitage at the Skegemog Point site is Norwood chert (Table 32). Overall, it accounts for 79% of the debitage in the assemblage. Within the excavation blocks at the site its frequencies range between 70% and 80%. Interestingly, the portion of the site which containing the bulk of the early Late Woodland occupation (Skegemog phase), Area 1, shows the lowest frequency of Norwood chert (71.7%). The frequency of Norwood chert in the areas primarily associated with the Traverse phase occupations, Areas 2 and 3, is slightly higher at 88.6% and 78.2%, respectively. The high value of 95.9% in Area 2A may be the result of sampling error. Area 2A is one of the smallest excavation clusters consisting of a series of scattered test units.

Slightly more than half (57.2%) of the Norwood chert recovered at the site exhibits signs of thermal alteration. Although intentional heat treatment of the chert certainly was important, the value is considered to be inflated as a result of post-depositional heating. A similar situation is also seen with the glacially derived cherts discussed below.

Norwood chert is a good to medium quality chert associated with the Middle Devonian age Traverse group of limestone (Cleland 1973; Luedtke 1976:257; Pohl 1930). The primary prehistoric source of this chert is the Pi-wang-go-ning Quarry site just north of Norwood, Michigan in southern Charlevoix County (Cleland 1973; Luedtke 1976:262). Here, not only are the chert bearing deposits exposed along the Lake Michigan shoreline, but the beaches are also literally paved with chert and limestone cobbles. A second bedrock and gravel source is located a short distance away where Whiskey Creek has exposed the bedrock. A third source consisting entirely of glacially transported material is located at Hayden Point on the southern shore of Lake Charlevoix (Luedtke 1976:267; Michigan State University Museum site files).

Typically, Norwood chert is visually distinctive. It has a fine to medium texture, luster ranges from dull to shiny, and its structure consists of fine, horizontal

Table 32. Raw Material Frequencies at the Skegemog Point Site

AREA	NORWOOD	HT NORWOOD	GLACIAL	HT GLACIAL	EXOTIC	TOTAL
						Ct
1	27.2	44.5	12.9	15.1	0.2	7260
1A	28.8	45.4	16.7	8.8	0.2	1825
1B	38.1	42.6	12	7.2	0.1	1571
2	40.6	48	5.3	5.9	0.2	6025
2A	60.9	35	3.7	0.4	0	271
3	32	46.2	12.9	8.3	0.5	2262
4A	35.4	42	9.2	13	0.4	1473
4B	36.5	42.9	10.5	10	0.1	1572
5	32	44.5	10	13.4	0.1	1561
Prof. Tr.	48.4	45.3	4.2	2.1	0	95
Surface	41.4	54.5	2.5	1.6	0	191
Total	33.8	45.2	10.5	10.2	0.3	24506

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laminations. A majority of the chert is pale or light gray in color with the range of color including darker grays, tans, and pale browns (Luedtke 1976:264-266). Atypical varieties available at the main exposure include forms with cross-bedded and convoluted laminations along with forms which lack clear bedding and have a speckled or "beaded" gray on light gray appearance. This latter variety appears to be the primary type available at the Hayden Point locality (Luedtke 1976:267). In its primary context, Norwood chert occurs in a series of tabular lenses 2 to 15 cm thick (Luedtke 1976:264). As a result, cobbles of this chert tend to be rectangular shaped and occur in a wide range of usable sizes. Furthermore, these cobbles are already stress tested and were favored to some degree prehistorically.

Glacial cherts comprise 20.7% of the chert debitage (Table 32). The frequency of glacial cherts in the individual excavation areas roughly mirrors that of Norwood chert. Again, although the differences are slight, the highest frequency of glacial cherts is loosely associated with the early Late Woodland occupation of the site.

Luedtke (1976:217) indicates that the vast majority of the glacial chert available within the Straits of Mackinac and Grand Traverse Bay regions is composed of Cordell chert and that this is most likely its primary source of collection. Minor components of the glacially available cherts include Bois Blanc and St. Ignace cherts from the Straits of Mackinac area along with a variety of high and medium grade cherts from much more distant sources. Also, given that little usable material is generally transported more than 64 to 80 km (40 to 50 mi) from its source (Luedtke 1976:97-98), these cherts would have been most available in the area between the Pi-wang-go-ning Quarry and the Straits of Mackinac. While Cordell chert certainly occurs in the gravels south of Norwood, Michigan, presumably Norwood chert would have replaced it as the primary constituent. The beaches south of the Traverse Bay region are notoriously poor sources of glacially derived chert.

Cordell chert is an opaque, fine to medium textured tabular chert with a dull to shiny luster. It is associated with the Middle Silurian age Cordell Formation limestones. The color of the chert is generally homogeneous ranging from dark brown to light and medium shades of gray (Luedtke 1976:214-217). It is the gray varieties which appear to be the most prevalent form in the glacial gravels. In terms of its suitability as a raw material for chipped stone tools, Cordell chert shares a number of similarities with Norwood chert, although the two cherts are visually and chemically distinct from one another.

The other identifiable components of the local glacially available cherts, Bois Blanc chert and St. Ignace chert, are generally classified as low quality cherts and do not appear to have been exploited extensively prehistorically (Luedtke 1976:211, 279). Bois Blanc chert, originating in the Lower Devonian Bois Blanc formation limestones, is a somewhat variable chert with textures ranging from fine to coarse and a generally dull luster. Color ranges include pale gray to cream, medium to dark gray, and light to medium grayish brown. The structure is often mottled and banded with common

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crystalline cavities and limy inclusions (Luedtke 1976:210-211). St. Ignace chert is more uniform consisting of an opaque, coarse textured, homogeneous, light to medium gray colored chert associated with the Upper Silurian St. Ignace dolomite (Luedtke 1976:277-279). These varieties account for less than ten percent of the glacial cherts at Skegemog Point.

In addition to the above chert types, a variety of other high and medium quality cherts from much more distant bedrock sources are also present in the glacial gravels of northern Michigan. These are generally lustrous, fine textured cherts exhibiting a wide range of colors, primary among which are light grays to bluish grays. A small amount of jasper and quartzites was also available in the glacial gravels. These occur in only trace amounts in the Skegemog Point assemblage. It may also be presumed that the variety of igneous, metamorphic and sedimentary rocks employed in the manufacture of coarse stone tools were derived from secondary deposits in northern Michigan.

Cherts which could be identified as true exotic or nonlocal cherts are restricted to a few varieties, all of which occur in low frequencies. Together, they account for a mere 0.3% of the debitage (Table 32). Included here are Lambrix chert, Bayport chert, Onondaga chert, Kettle Point chert and a small amount of material of unidentified/unspecified nonlocal origin. Of these, Bayport, Onondaga, and Kettle Point chert are represented primarily by stone tools assignable to pre-Late Woodland occupations of the site. Lambrix chert, a low grade till chert from central Oceana County (Luedtke 1976:343) accounts for approximately half of the nonlocal cherts identified in the assemblage. Bayport chert from the Saginaw Bay region is represented by five flakes, while only a single flake of Kettle Point chert was identified. The extremely low frequency of these chert types, along with their more extensive utilization during earlier periods makes their assignment to the Late Woodland occupations problematic. Additional exotic cherts, presumably of nonglacial origin, includes a fine textured, lustrous white chert, a lustrous dark bluish black chert, and a semi-translucent amber chert.

In sum, the raw material profile indicates an overwhelming preference for locally available chert sources present within the Traverse Corridor. Given that the primary bedrock outcrop of Norwood chert is located only about 45 km north of the site, it is not surprising that it was the primary raw material used for the production of stone tools. Secondary sources of glacially transported Norwood chert would also have been available much closer to the site. While some chert types may have been obtained through contact with groups based in the Straits of Mackinac and the northern portions of the Traverse Corridor, the frequency of this interaction is impossible to gauge. For example, glacial cherts such as Cordell could have been directly procured from the extensive gravel deposits located within this part of the state. Further, since Cordell and Norwood chert have similar knapping qualities there would not have been a technological reason to prefer one over the other. The relative absence of southern derived cherts appears to be a function of the poor quality of Lambrix chert and distance to the source in the case of Bayport chert. Simply put, there was little reason

or need to import other varieties of chert. Rather, the groups located around the southern end of Grand Traverse Bay may best be viewed as a potential source of chert for groups located to the south rather than vice versa. The presence of a major cultural boundary between groups living at the base of Grand Traverse Bay and those in the Straits of Mackinac region suggested by Cleland (1990) on the basis of ethnohistorical information also appear to be a contributing factor in limiting the flow of Cordell and other desirable northern cherts in a southerly direction.

DEBITAGE

Debris from the manufacture and maintenance of chipped stone tools was ubiquitous throughout the site. As noted above, the classification of the debitage is designed to reflect the general stage of reduction from which it was derived. Five primary classificatory categories were employed; 1) shatter, 2) decortication flakes, 3) blocky secondary or primary flakes, 4) flat secondary thinning and trimming flakes, and 5) cores. Cores are discussed more fully below. Within each flake category particular attention was paid to the nature of the striking platform. Two varieties of striking platforms were defined. The first are simple striking platforms. These are generally flat to slightly acute, lack faceting, and are rarely extensively ground (Robertson 1983, 1986). The second variety is complex striking platforms. These are usually oriented at a sharp acute angle, are multi-faceted, and show evidence of lateral grinding of the platform (Robertson 1983, 1986).

Shatter is defined as irregular, angular pieces of chert which lack clear or consistent evidence of flake scars or negative bulbs of percussion. Since shatter is the product of heavy percussion and the failure of the chert along natural planes of weakness it tends to be associated with the initial testing and preparation of cores (Binford and Quimby 1963:279). Overall, shatter accounts for 5.5 % of the debitage present at the site, ranging between a high of 12.7% in Area 3 and a low of 1.8% in Area 4A (Table 32). Shatter size is relatively small, with the majority measuring less than 3 square centimeters in size and weighing an average of 4.4 gm.

A total of 2,938 decortication flakes weighing 8,845.5 gm was identified in the lithic assemblage (Table 32). Decortication flakes, like shatter, are generally reflective of the initial stages of core preparation. These flakes are defined by the retention of cortex over 75% or more of their dorsal surfaces (Binford and Quimby 1963:287). This flake type was further subdivided into flat and blocky varieties based upon the angularity and robustness of the flake's cross-section. Blocky decortication flakes are slightly more abundant than flat decortication flakes, accounting for 6.2% (N=1,526) of the total assemblage. Invariably, blocky decortication flakes have simple striking platforms and often exhibit evidence of heavy percussion in the form of large bulbs of percussion often with radial lines of stress fractures, and crushed and collapsed

striking platforms. As with all of the core related debitage, there is a relatively high frequency of broken flakes and flakes terminating in a hinge-out fractures.

Morphologically, flat decortication flakes are identical to flat flakes except for the presence of cortex on the dorsal face of the flake. Both platform conditions are present in this debitage class. Flat decortication flakes with simple platforms tend to be a by-product of core preparation and reduction. A total of 1,366 flat decortication flakes with simple striking platforms are present in the assemblage, accounting for 5.6% of the debitage. On the other hand, decortication flakes with complex striking platforms are associated with biface reduction. This variety of decortication flake is rare in the Skegemog Point lithic assemblage with only 46 specimens recorded (Table 32). Thus, it may be concluded that interior flakes are preferred for further reduction.

Further, the highly localized nature of the chert procurement activities is supported by detailed analysis of the decortication flakes. Only 447 decortication flakes (15.1%) exhibit the weathered and rounded cortex typical of beach cobbles collected for comparison at the Pi-wang-go-ning Quarry site. This figure suggests that a fair proportion of the chert cobbles brought to the site for reduction consist of glacially transported specimens. It is unclear whether these were collected in the vicinity of the quarry area or areas to the south.

Blocky secondary flakes represent the next stage of lithic reduction. A total of 4,964 blocky secondary flakes weighing 9,661.3 gm are recorded for the site (Table 32). These flakes are characterized by relatively thick, angular cross-sections; large, robust striking platforms with little prior preparation; and few, but large flake scars on the dorsal surface. Shape tends to be either linear or slightly expanding, largely a function of the tabular or pseudo-tabular shape of many of the cores. By definition blocky flakes never exhibit complex striking platforms. As such, this flake category is largely indicative of primary core reduction activities, although there is some overlap of flake morphology with those derived from the initial thinning and shaping of stage 1 bifaces. Blocky secondary flakes are also a primary source of tool blanks for a majority of the bifacial and formal unifacial tools.

Flat secondary flakes represent the middle and final stages of lithic reduction. They account for 62.2% of the debitage at the site (Table 32). These flakes are typically relatively small with thin, scalene or lenticular cross-sections and numerous small flake scars on their dorsal surfaces. Striking platforms tend to be diminutive. Of the 15,264 flat flakes recorded for the assemblage a total of 4,906 flakes weighing 3,919.0 gms exhibit simple striking platforms. These flakes are produced from the final stages of core reduction and the initial and middle stages of biface manufacture. Overlap from these two activities occurs mostly among the larger and heavier flakes in this category. On the other hand, flat flakes with complex striking platforms are exclusively the product of bifacial thinning and trimming activities. Approximately 30%, or 4,631 specimens weighing 2,405.4 gms, exhibited complex striking platforms.

The remaining 5,727 flat flakes consist of broken specimens lacking the striking platform.

CORES

Cores are defined as any piece of raw material which have been prepared for and exhibit systematic flake removal. This definition follows that used by Lovis (1973:110) and Binford and Quimby (1963:83). Classification of the cores also follows the divisions employed by Lovis (1973:110-125). This sequence of types, based upon the technique and pattern of flake removal as well as overall size and shape, generally reflects a progressive sequence of core reduction (Lovis 1973:110, 158-162). Thus, the 249 specimens present in the Skegemog Point assemblage were subdivided into 1) unaltered chert cobbles (N=11), 2) block cores (N=79), 3) bipolar cores (N=126), 4) plano-convex cores (N=13), 5) biconvex cores (N=4), 6) amorphous cores (N=8) and, 7) unidentified cores (N=9). Metric dimensions are presented in Table 33 .

Unaltered chert cobbles (Table 33) are chert pieces which have been transported to the site but not tested or reduced in any way. These artifacts may represent pieces of raw material stored for later use. These cobbles generally have rectangular shapes and tabular to wedge-shaped cross-sections. The average length is 60.1 mm, the average width is 46.2 mm, and the average thickness is 31.3 mm. All but three of the cobbles are Norwood chert. A total of 11 specimens are present in the assemblage.

Block cores (Figure 64; Table 33) comprise 31.6% of the cores from the Skegemog Point site. They are considered to represent the first stage of the manufacturing trajectory for tabular or rectangular blocks of chert (Lovis 1973:159). These cores are usually rectangular in shape, either rectangular or tabular in cross-section, and exhibit limy cortex on opposing ends. A small minority of these cores exhibit a variety of atypical shapes and cross sections. Length averages 43.5 mm with a range of 20.3 to 79.2 mm, width averages 41.0 mm with a range of 10.9 to 75.8 mm, and thickness averages 21.2 mm with a range of 8.1 to 51.2 mm.

Block cores generally exhibit little platform preparation prior to flake removal. Most often the cortical ends of the cores serve as the striking platform and flakes are generally removed from only a single face. Flake scars tend to be linear, often terminating in a hinge fracture. This frequently resulted in the failure of the core. Free-hand techniques appear to be the primary fashion for working these cores. Nearly one-third of the block cores do exhibit evidence of bipolar percussion and at least one core exhibits a combination of free-hand and bipolar methods. The block cores from the Skegemog Point site are about equally divided among specimens in the early stage of reduction (33.3%), the middle stages of reduction (34.6%), and exhausted nuclei (32.1%). The ratio of 1.6 unexpended cores per exhausted core at the Skegemog Point site is similar to that reported for the Pine River Channel site (1.3; Holman 1978:288).

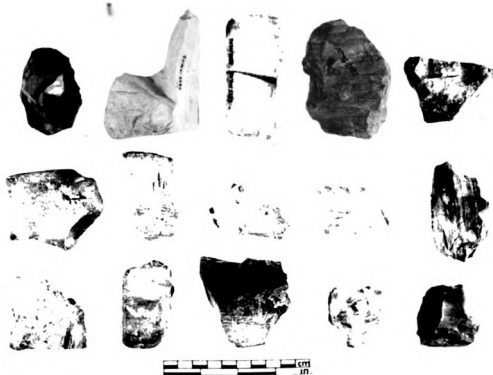


Figure 64. Block Cores.



Figure 65. Bipolar Cores.

Table 33. Cores

Acc. No.	Shape	Cross Section	Length mm	Width mm	Thick. mm	Raw Mat.
Chert Cobbles:						
1.05	Rectang	Ovate	46.5	43.4	26.5	G
4.01	Rectang	Triang	37.1	31.3	27.0	N
5.01	Rectang	Rectang	73.0	59.7	35.1	N
9.01	Ovate	Biconvex	77.0	61.3	35.7	N
13.01	Rectang	Tabular	42.4	37.0	21.5	G
23.08	Rectang	Rectang	69.0	38.4	35.8	N
47.04	Rectang	Rectang	64.2	48.2	28.3	HG
58.02	Rectang	Wedge	83.4	55.5	33.0	N
58.04a	Rectang	Wedge	56.0	35.0	30.0	N
58.04b	Rectang	Rectang	48.3	25.0	21.0	N
88.02	Rectang	Wedge	64.4	73.0	50.5	N
Block Cores:						
1.02	Rectang	Wedge	37.0	25.8	(16.8)	N
1.04	Indeter	Indeter	(33.8)	(38.5)	(10.6)	HN
2.06a	Rectang	Tabular	(18.8)	50.9	18.3	N
2.06b	Indeter	Polygonal	29.5	(27.8)	11.5	N
2.10	Rectang	Tabular	31.5	46.2	20.6	N
3.06	Trapez.	Tabular	50.5	42.5	21.6	HN
4.04	Rectang	Tabular	44.0	43.4	14.5	HN
5.01	Rectang	Square	(45.2)	39.5	22.1	N
6.12	Rectang	Polygonal	41.0	40.8	31.6	HN
8.02	Rectang	Trapezoid	40.0	34.8	23.4	N
9.01	Polygon.	Biconvex	41.2	(24.3)	22.0	HN
4.01	Rectang	Tabular	(63.6)	61.0	35.0	N
15.01	Rectang	Tabular	37.4	47.6	10.1	N
28.03a	Rectang	Rectang	45.6	40.7	26.5	N
28.03b	Rectang	Rectang	60.3	39.5	27.9	N
28.03b	Rectang	Rectang	60.3	39.5	27.9	G
28.03c	Rectang	Rectang	50.4	45.9	27.5	HN
28.03d	Rectang	Tabular	57.0	17.9	16.2	HN
28.06	Rectang	Tabular	28.6	34.9	14.2	N
28.07	Rectang	Tabular	47.4	62.7	19.2	N
28.20	Trapez.	Tabular	51.2	38.4	17.7	N
28.24	Ovate	Triang	71.5	45.1	32.2	HN
30.01	Ovate	Trapezoid	(34.7)	31.4	19.1	HG
31.01a	Rectang	Rectang	(34.7)	43.6	22.3	N
31.01b	Ovate	Plancon.	59.7	36.3	17.7	N
31.01c	Rectang	Tabular	32.0	57.5	17.6	N
31.03	Rectang	Rectang	48.0	(23.3)	27.4	N
38.05	Rectang	Tabular	(34.0)	45.4	19.0	N
40.04	Triang	Rectang	61.7	34.6	30.0	N
40.05	Rectang	Polygonal	43.8	24.3	21.1	N
45.05	Polygon	Tabular	45.7	28.5	12.6	HN
46.03	Ovate	Tabular	57.3	(31.9)	17.3	N

Table 33 (cont'd).

Acc. No.	Shape	Cross Section	Length mm	Width mm	Thick. mm	Raw Mat.
Bipolar Cores:						
1.04	Triang	Polygonal	(18.2)	16.0	14.0	HG
2.01a	Ovate	Wedge	20.0	21.8	8.1	G
2.01b	Rectang	Tabular	35.4	30.9	15.7	N
2.06	Rectang	Trapezoid	48.2	27.0	21.7	HN
2.12	Ovate	Trapezoid	16.5	25.6	13.6	N
4.01a	Rectang	Biconvex	42.6	29.8	10.5	HN
4.01b	Ovate	Rectang	24.4	16.5	8.8	HN
4.01c	Rectang	Wedge	58.0	48.2	20.1	HN
4.07	Ovate	Planocon	31.5	24.8	14.4	HN
4.08	Indeter	Indeter	(24.5)	(14.5)	(13.0)	G
6.02	Indeter	Indeter	(17.8)	9.6	6.5	HG
6.04a	Rectang	Rectang	38.7	26.8	22.6	N
6.04b	Ovate	Biconvex	26.5	25.8	9.7	N
6.04c	Rectang	Triang	25.7	10.0	9.3	HN
6.04d	Indeter	Biconvex	(16.1)	24.3	17.0	G
6.07	Rectang	Wedge	33.4	20.0	12.6	HN
6.16	Ovate	Biconvex	27.9	(11.8)	14.5	N
7.01	Trapez	Triang	28.2	21.4	17.0	N
7.03a	Rectang	Rectang	21.3	(10.7)	8.5	G
7.03b	Rectang	Tabular	36.8	25.5	12.6	HG
7.05	Rectang	Tabular	36.8	21.0	10.3	HG
7.10	Rectang	Wedge	28.1	8.3	5.4	G
7.12a	Rectang	Square	(27.4)	32.7	26.0	HG
7.12b	Rectang	Tabular	30.8	30.7	13.7	HG
8.02	Indeter	Indeter	40.2	(14.8)	(9.8)	HN
8.07	Rectang	Biconvex	20.3	18.3	8.1	G
9.01	Indeter	Indeter	(17.0)	(29.9)	(13.6)	G
10.02	Rectang	Tabular	30.2	20.3	8.7	HN
12.01	Rectang	Tabular	37.1	25.4	11.0	HN
19.02	Rectang	Rectang	23.6	15.8	8.1	G
23.02	Rectang	Rectang	(15.4)	10.1	11.5	G
25.01	Rectang	Triang	36.2	25.8	11.2	N
31.01	Rectang	Trapezoid	28.1	19.7	12.4	N
31.05	Rectang	Planocon	29.0	26.4	11.9	G
36.01a	Rectang	Tabular	34.3	(13.6)	8.8	N
36.01b	Ovate	Ovate	20.5	28.6	20.8	N
36.01c	Indeter	Rectang	(29.8)	(19.7)	(23.2)	HN
37.04	Rectang	Biconvex	29.3	21.7	8.4	N
38.02	Rectang	Rectang	23.4	18.0	13.0	G
39.01	Rectang	Rectang	30.5	22.6	17.1	HG
40.01	Rectang	Triang	31.9	23.0	9.9	N
40.03	Rectang	Triang	23.1	15.6	8.2	HG
40.05a	Ovate	Wedge	12.5	16.2	12.7	HG
40.05b	Indeter	Square	(11.7)	10.6	8.8	HN
42.02a	Rectang	Tabular	25.1	(23.2)	9.0	G
42.02b	Rectang	Rectang	30.7	23.4	16.5	G
42.03	Rectang	Biconvex	19.0	(16.3)	9.4	G

Table 33 (cont'd).

Acc. No.	Shape	Cross Section	Length mm	Width mm	Thick. mm	Raw Mat.
46.06	Trapez	Rectang	42.5	61.1	26.0	N
47.01a	Rectang	Trapezoid	42.5	27.4	20.7	HN
47.01b	Rectang	Tabular	38.6	26.5	11.0	HN
47.05	Ovate	Rectang	46.0	48.1	25.0	N
47.09	Rectang	Trapezoid	35.6	43.4	20.5	N
48.02	Rectang	Rectang	20.3	10.9	10.1	HN
50.01	Indeter	Indeter	34.5	(25.5)	12.0	HN
50.02a	Rectang	Rectang	60.1	35.0	25.8	N
50.02b	Rectang	Rectang	26.7	50.9	22.6	N
51.01a	Indeter	Trapezoid	(31.0)	(27.3)	13.0	N
51.01b	Trapez	Wedge	35.3	(36.5)	(18.3)	HN
51.01c	Rectang	Wedge	25.2	30.0	11.2	N
53.02	Ovate	Tabular	55.2	67.4	25.0	HG
69.01	Ovate	Planocon	38.6	31.4	19.8	HN
69.02	Rectang	Square	35.7	21.4	21.8	N
80.01	Rectang	Rectang	(35.4)	37.5	22.1	HN
82.02	Indeter	Indeter	(31.3)	(26.7)	22.3	N
83.01	Indeter	Indeter	(41.1)	(22.3)	19.8	HN
84.02a	Rectang	Triangular	41.4	14.4	9.3	HN
84.02b	Rectang	Square	29.6	17.0	18.9	G
84.03	Triang.	Tabular	34.2	37.5	13.0	HN
84.04	Ovate	Indeter	59.6	43.9	(16.4)	HG
84.09	Rectang	Rectang	33.2	44.3	27.0	G
96.01	Ovate	Wedge	79.2	63.2	36.6	HN
104.02a	Rectang	Rectang	84.8	75.0	38.6	N
104.02b	Rectang	Rectang	27.9	44.6	17.4	G
104.02c	Ovate	Biconvex	37.3	36.4	16.3	HN
106.01a	Rectang	Rectang	(39.4)	66.5	27.7	N
106.01b	Rectang	Rectang	(46.4)	43.3	21.6	N
106.01c	Rectang	Rectang	39.3	43.3	24.1	N
106.01d	Rectang	Tabular	45.3	39.6	15.5	N
139.02a	Ovate	Tabular	36.5	46.5	23.0	N
139.02b	Rectang	Tabular	46.4	75.8	32.4	G
147.02	Ovate	Biconvex	42.4	43.0	16.3	HN
161.01	Rectang	Rectang	32.0	50.4	51.2	N
163.09	Rectang	Rectang	(48.6)	47.6	19.5	G
164.03a	Rectang	Wedge	(55.2)	36.5	26.0	G
164.03b	Indeter	Tabular	(16.0)	(30.6)	8.1	HN
176.01	Indeter	Indeter	(22.8)	(12.3)	(19.5)	N
181.01	Ovate	Tabular	57.6	41.0	21.3	G
183.01	Polygon.	Polygonal	41.5	42.0	30.3	N
184.02	Rectang	Tabular	56.0	(31.7)	(24.0)	G
195.01a	Rectang	Tabular	43.2	32.0	16.3	N
195.01b	Rectang	Trapezoid	(57.0)	41.5	26.4	HN
198a	Rectang	Tabular	22.4	36.3	14.3	HN
198b	Rectang	Trapez	24.9	19.2	19.3	HN
000	Rectang	Tabular	(26.8)	36.5	9.6	N

Table 33 (cont'd).

Acc. No.	Shape	Cross Section	Length mm	Width mm	Thick. mm	Raw Mat.
42.06	Indeter	Rectang	(19.0)	(14.1)	16.4	HG
43.01	Ovate	Biconvex	21.4	19.7	7.5	G
43.02	Triang	Wedge	33.0	28.0	10.6	HN
43.07	Rectang	Trapezoid	52.3	31.7	21.7	N
44.01	Rectang	Planocon	36.7	27.6	15.6	N
45.02	Rectang	Trapezoid	26.2	10.6	7.9	HN
45.07	Rectang	Rectang	33.8	22.3	16.3	HN
46.03	Indeter	Polygonal	(9.0)	(21.5)	(8.5)	HG
46.05	Ovate	Planocon	28.5	14.3	8.1	HG
46.06	Rectang	Tabular	24.8	13.4	13.1	N
47.06a	Rectang	Wedge	33.8	15.0	6.2	HN
47.06b	Ovate	Tabular	41.8	19.0	8.3	HN
50.02	Indeter	Wedge	(22.5)	(41.0)	(23.5)	N
50.03	Ovate	Biconvex	40.2	(22.3)	14.8	HG
51.01a	Rectang	Tabular	27.0	18.9	11.6	G
51.01b	Rectang	Rectang	24.2	21.7	14.3	N
51.08	Ovate	Bicon	29.5	(15.1)	11.5	N
51.12	Rectang	Biconvex	37.5	25.8	14.6	N
52.01	Indeter	Square	(22.5)	(11.2)	(9.6)	HN
54.01	Ovate	Indeter	31.7	15.5	(9.0)	N
58.01a	Ovate	Trapezoid	35.1	(23.6)	15.9	N
58.01b	Indeter	Indeter	(15.2)	(16.8)	(9.3)	G
58.01c	Rectang	Rectang	24.3	7.0	7.4	N
61.01	Rectang	Diamond	43.6	21.4	20.0	G
65.03	Rectang	Tabular	33.7	29.0	16.8	N
66.01	Ovate	Tabular	48.6	50.8	13.9	HN
68.02a	Triang	Rectang	58.4	49.9	22.1	N
68.02b	Ovate	Biconvex	31.8	28.7	15.6	N
68.02c	Ovate	Triangular	26.4	10.4	8.0	HG
69.01a	Rectang	Trapezoid	33.5	29.8	13.8	HN
69.01b	Ovate	Triangular	27.1	11.6	10.3	HN
69.02a	Ovate	Planocon	(17.6)	12.8	7.4	HG
69.02b	Trapez	Tabular	23.6	27.1	6.2	HN
70.02a	Ovate	Biconvex	28.3	25.0	10.9	HG
70.02b	Rectang	Tabular	22.5	25.0	8.7	N
71.01	Rectang	Wedge	34.8	21.7	9.5	HG
71.02	Indeter	Biconvex	29.5	(10.5)	6.4	HN
72.01a	Rectang	Rectang	36.7	17.0	15.2	HG
72.01b	Ovate	Tabular	32.7	35.1	13.7	N
74.01a	Ovate	Planocon	36.2	(24.1)	18.6	G
74.01b	Square	Biconvex	22.6	23.9	11.5	HG
80.01	Rectang	Planocon	29.5	29.4	12.3	HG
81.06	Ovate	Trapezoid	52.4	29.9	35.0	HG
82.02a	Ovate	Tabular	42.1	38.5	30.1	N
82.02b	Rectang	Biconvex	40.7	11.7	8.8	G
82.02c	Indeter	Indeter	33.0	(12.1)	13.0	HG
83.01a	Indeter	Biconvex	(16.4)	13.0	7.9	G
83.01b	Indeter	Planocon	(12.0)	(15.3)	7.8	G

Table 33 (cont'd).

Acc. No.	Shape	Cross Section	Length mm	Width mm	Thick. mm	Raw Mat.
84.02	Rectang	Planocon	27.8	11.8	7.6	G
84.03	Square	Tabular	23.5	21.1	8.4	G
84.04	Ovate	Rectang	(25.1)	25.0	16.3	G
85.01	Rectang	Rectang	18.0	13.0	10.5	G
90.01	Rectang	Triang	27.0	22.1	14.0	G
92.02	Ovate	Tabular	32.7	21.0	6.1	G
104.02a	Ovate	Biconvex	39.0	39.4	16.3	HN
104.02b	Ovate	Trapezoid	34.3	22.0	18.9	HG
104.02c	Ovate	Planocon	26.2	(12.7)	6.7	G
104.02d	Rectang	Tabular	28.7	(14.8)	8.6	G
104.02e	Ovate	Biconvex	22.1	(16.5)	5.5	G
145.01	Indeter	Indeter	(26.7)	(31.8)	26.6	HN
146.01	Rectang	Biconvex	29.5	(13.2)	8.8	HN
154.01	Rectang	Biconvex	28.3	17.9	10.9	HN
156.02	Rectang	Tabular	20.8	25.8	9.5	G
156.06	Rectang	Tabular	31.6	(24.1)	7.4	HN
161.01	Indeter	Wedge	(17.1)	(19.8)	10.6	HN
163.01a	Rectang	Biconvex	23.4	(17.7)	8.0	N
163.01b	Ovate	Planocon	23.1	(14.3)	11.5	HN
163.02	Rectang	Tabular	27.5	(9.7)	7.3	N
176.02a	Ovate	Trapezoid	37.7	31.5	23.6	HN
176.02b	Ovate	Triang	23.1	16.2	10.5	HN
179.02	Ovate	Triangular	24.6	14.5	9.6	HN
180.01a	Rectang	Tabular	39.0	32.3	14.6	N
180.01b	Rectang	Biconvex	(24.0)	11.5	7.8	HG
180.01c	Rectang	Planocon	28.4	17.4	5.9	HG
181.02	Rectang	Tabular	(44.4)	30.0	13.9	G
181.02	Rectang	Biconvex	(18.6)	24.0	10.0	HG
184.01	Rectang	Biconvex	25.6	32.0	14.8	N
189.01	Rectang	Rectang	29.6	26.5	22.8	HN
000	Ovate	Planocon	22.0	21.3	11.3	N
Planoconvex Cores:						
2.02	Ovate	Planocon	47.8	33.4	16.5	HN
7.12	Indeter	Tabular	(30.0)	39.5	18.6	HG
8.02	Rectang	Rectang	46.2	34.8	29.4	HN
9.01	Ovate	Triangular	39.4	32.7	21.7	HN
31.03	Ovate	Triangular	71.7	50.0	32.2	G
33.04	Ovate	Wedge	46.0	50.3	36.5	N
50.01	Rectang	Polygonal	40.3	51.0	30.0	HN
61.02	Ovate	Triangular	40.2	46.3	23.6	HN
69.02	Ovate	Biconvex	40.4	38.8	23.2	N
84.02a	Ovate	Tabular	44.8	44.5	20.6	N
84.02b	Ovate	Tabular	(29.4)	33.8	23.0	N
84.03	Ovate	Tabular	47.8	42.6	17.6	G
92.02	Ovate	Tabular	32.7	21.0	6.1	G

Table 33 (cont'd).

Acc. No.	Shape	Cross Section	Length mm	Width mm	Thick. mm	Raw Mat.
Biconvex Cores:						
22.04	Rectang	Rectang	36.1	39.0	24.6	HN
31.04	Ovate	Biconvex	65.0	59.6	27.0	N
58.01	Ovate	Biconvex	65.4	60.2	25.0	N
83.01	Ovate	Biconvex	54.5	48.2	26.1	HN
Amorphous Cores:						
29.03	Rectang	Tabular	(23.3)	30.8	13.5	HG
34.01	Ovate	Triangular	36.2	30.3	22.0	N
61.02	Rectang	Rectang	51.8	45.0	32.4	G
65.01	Rectang	Biconvex	(29.8)	33.4	20.7	HG
70.03	Ovate	Biconvex	(28.7)	39.8	11.7	HN
75.01	Rectang	Square	24.6	13.6	14.3	G
82.02	Rectang	Rectang	42.8	28.7	21.6	HG
164.02	Ovate	Trapezoid	37.1	37.7	31.7	N
Unidentified Cores:						
6.17	Indeter	Indeter	(15.0)	(12.7)	(13.3)	N
7.02	Indeter	Tabular	(21.1)	(11.1)	(8.4)	G
40.01	Indeter	Indeter	(40.3)	(26.1)	(17.7)	G
31.07	Rectang	Rectang	(34.7)	(21.0)	11.4	HN
35.01	Rectang	Tabular	37.5	15.7	8.0	HN
36.02	Triang	Rectang	(36.3)	(29.8)	(16.3)	HN
46.05	Square	Square	35.6	35.0	22.0	HG
48.04	Indeter	Indeter	(19.8)	(11.1)	(10.5)	N
61.01	Ovate	Ovate	40.6	28.3	18.3	HN

and the O'Neil site (1.2; Lovis 1973:110). All of the block cores, except 15 specimens, are manufactured from Norwood chert. Of these, virtually all are minimally rolled cobbles.

A total of 126 bipolar cores (Figures 65 and 66; Table 33) have been identified, accounting for 50.4% of the cores. This class of cores is very distinctive and is distinguished by the presence of opposing areas of percussion. This is a result of: 1) the use of a hammer and anvil which creates distal damage from end shock and rebound, and 2) by rotating the cores 180 degrees during successive flake removal. These cores were further subdivided according to the six part scheme developed by Binford and Quimby (1963). Only five of the defined types occur at the Skegemog Point site. They include; 1) ridge/area (N=44), 2) opposed ridge (N=30), 3) ridge/point (N=8), 4) area/point (N=15), and 5) opposed point (N=4) varieties. An additional 25 specimens are too fragmentary for complete identification.

Overall, the bipolar cores have fairly uniform shapes. Slightly more than half (51.6%) are rectangular, while slightly less than one-third (28.6%) have ovate shapes. The latter shapes tend to be associated with the varieties exhibiting a point on one or both ends of the core. The range of cross-section shapes is slightly greater, although a majority of the bipolar cores have either tabular (36.5%), biconvex (19.8%), or plano-convex (10.3%) cross-sections. While there is a relatively broad range of sizes represented among these cores, as seen in Table 34, there is not much difference in either the average dimensions or the ranges of the dimensions across the five varieties present at the site. Raw material for the bipolar cores is almost evenly split between Norwood chert (53.2%) and medium quality glacial cherts (46.2%). Nearly all of the cores also tend to be made on well rolled and weathered cobbles or pebbles.

This classification also reflects a progressive sequence of reduction within this core type. In this sequence, the striking platform begins as an area of percussion on a freshly split cobble or pebble. Ridge/area cores are examples of this stage of the sequence. Two varieties of ridge/area cores were recognized at the Skegemog Point site. Differentiation of these varieties is based upon the relative width of the proximal ridge of percussion. In the first variety the ridge is relatively broad so that these cores may be more appropriately termed area/area cores. These cores tend to be slightly larger than the second variety, were generally flaked on one face only, and exhibit only one platform from which flakes were removed. They also show a number of morphological similarities to some of the heavily flaked and rejected block cores, a situation also noted by Lovis (1973:120) at the O'Neil site. The second variety is characterized by a narrow ridge of percussion on the proximal end of the core (Binford and Quimby 1963).

As the core is reduced the area of percussion evolves into a ridge of percussion, which, in turn, is eventually reduced to a point of percussion. Therefore, the opposed ridge, area/point, and ridge/point varieties may be viewed as representing the middle

Figure 66. **Bipolar Cores.**

Figure 67. **Plano Convex, Biconvex and Amorphous Cores**

Row 1: **Plano Convex Cores**

Row 2: **Biconvex Cores**

Row 3: **Amorphous Cores**



Figure 66.



Figure 67.

Table 34. Comparative Dimensions of Bipolar Cores

Core Type	Length		Width		Thickness	
	Ave. mm	Range mm	Ave. mm	Range mm	Ave. mm	Range mm
Ridge/Area	31.8	12.5-58.4	27.3	13.0-50.8	15.0	7.4-28.0
Opposed Ridg	30.1	21.4-48.2	21.7	11.7-29.0	11.0	5.5-21.7
Ridge/Point	31.1	20.3-41.8	21.1	13.4-39.4	10.6	6.2-16.3
Area/Point	30.1	23.1-42.6	17.2	7.0-30.7	10.8	6.1-18.6
Opposed Poin	25.5	21.3-28.1	9.8	8.3-10.6	7.5	7.9- 8.5

stage of bipolar reduction. If the core survives long enough it may eventually be reduced to the opposed point variety. The high frequency of bipolar cores in the terminal stages of reduction at the site suggests that the vast majority shatter and splinter apart precluding further reduction into core types representing the later stages of bipolar reduction such as the opposed point variety.

Plano-convex cores (Figure 67) are the next most frequent core type represented at the site, although they represent only 5.2% (N=13) of the cores. These cores are almost exclusively ovate in shape and have triangular to tabular shaped cross-sections (Table 33). As defined by Fitting (1972:191), the flat face serves as the striking platform and flake removal takes place around the margins of the core. Striking platforms are not generally prepared, and many of the specimens appear to have begun as block cores (Lovis 1973:122). This also is the case with the plano-convex cores from the Skegemog Point site. Four of the cores are manufactured from glacial cherts, the rest are manufactured from Norwood chert.

Only four (1.6%) biconvex cores (Figure 67; Table 33) were identified in the assemblage. These cores are generally distinguished by bifacial flake removal and exhibit extensive flaking on most of the faces (Lovis 1973:122). Three of the specimens have ovate shapes with biconvex cross-sections while the fourth is rectangular in both shape and cross-section. All four are manufactured from Norwood chert.

Amorphous cores (Figure 67; Table 33) are defined by Lovis (1973:125) as irregularly shaped cores which exhibit random or nonsystematic patterns of flake removal. They also tend to be extensively flaked. Although irregular, the eight specimens from the Skegemog Point site tended to be rectangular or ovate in shape with rectangular to biconvex cross-sections. Five are manufactured from glacial pebbles and three are manufactured from Norwood chert.

An additional nine cores are too fragmentary to allow accurate identification and have been recorded as unidentified varieties.

CHIPPED STONE TOOLS

Projectile Points

Projectile points are one of the more numerous and internally diverse types of formally chipped stone tools present at the Skegemog Point site. They are also the most temporally and stylistically sensitive category of lithic artifact. A projectile point is any hafted biface whose primary function was to serve as the tip of a projectile. A number of studies (Ahler 1971; Greiser 1977; Robertson 1986, 1987; Semenov 1973) have shown that they also often served a secondary function as bifacial knives. While it is not the purpose of this study to specify usage (i.e., micro-wear analysis), the presence

of macro-damage suggestive of secondary use as a knife is noted when present. Regardless of specific function, this tool type can be confidently related to hunting activities and the initial processing of game.

The following classification represents an extensive revision of the original projectile point classification (Cleland n.d.a.). Since the time of the original analysis, our understanding of projectile point sequences and their interrelationships in Michigan and in the eastern United States has improved tremendously. This is also true for our knowledge concerning the geographic range of various types and clusters of morphologically related types and the amount of internal variation present within each type.

The purpose of the projectile point classification is twofold. The first is to formally systematize the morphological variation present within this diverse type of lithic artifact. The second purpose is to identify the temporal affiliation of the specimens recovered at the Skegemog Point site. The first allows the identification of stylistic variation within the assemblage, while the second allows the identification of artifacts which are not associated with the Late Woodland occupation of the site. This, in turn, provides a gauge of the intensity of the earlier occupation episodes and their relative contribution to the total lithic assemblage.

The 155 specimens assigned to this category have been subdivided into four Classes based on the gross morphology of the haft. Each Class, in turn, has been subdivided into types and varieties based upon variations within each haft class. The four defined classes are: 1) notched (N=30; 19.4%), 2) stemmed (N=12; 7.7%), 3) triangular (N=67; 43.2%), and 4) miscellaneous projectile point/knife fragments (N=46; 29.7%).

Class I: Notched Projectile Points

This class is distinguished by the presence of notching on the haft element and contains 30 specimens. It is subdivided into two types based upon the orientation of the notches. Thus, Type A projectile points are side notched and Type B projectile points are corner notched. The high degree of the morphological variation present within Class I projectile points reflects the diversity of cultural phases represented at the site. During the course of the reclassification of Type A projectile points it was possible to incorporate portions of the earlier classification (Cleland n.d.a.). The descriptive attributes of the initial three varieties of Type A points has been retained from the original classification (Cleland n.d.a.). It should be noted, however, that the constituent members have changed within each Variety.

Type A, Variety 1 (Figure 68; Table 35): The three specimens assigned to this group are medium sized projectile points with shallow, weakly defined side notches and thin, narrow triangular blades. The haft elements are relatively short and two of the specimens are characterized by an incurvate base producing a broad fishtail appearance

Figure 68. Class I, Type A, Variety 1, Variety 2 and Variety 3 Notched Projectile Points

Row 1: (Specimens 1-3) Variety 1;

Row 1: (Specimens 4-8) Variety 2

Row 2: Variety 3

Figure 69. Class I, Type A, Variety 4, Variety 5A, Variety 5B, Variety 6, and Variety 7 Notched Projectile Points

Row 1: (Specimens 1-3) Variety 4

Row 1: (Specimen 4) Variety 5A

Row 2: (Specimen 5) Variety 5B

Row 2: (Specimen 7) Variety 6

Row 2: (Specimen 8) Variety 7



Figure 68.



Figure 69.

Table 35. Class I: Notched Projectile Points

Acc. No.	Total Length	Blade Length	Blade Width	Haft Length	Haft Width	Max. Thick.	Notch Width Right	Notch Width Left	Notch Depth Right	Notch Depth Left	Blade Shape	Cross Section	Raw Material
Type A, Variety 1:													
9.03	(21.7)	(12.4)	15.5	9.3	12.5	4.2	5.0	4.9	1.7	1.8	Triang	Lentic	Norwood
42.01	45.6	36.2	17.1	9.4	20.3	6.0	6.1	4.6	1.5	1.5	Triang	Lentic	Norwood
53.02	34.4	24.0	15.0	10.4	12.3	5.5	5.8	4.5	0.8	0.6	Triang	Planocon	Norwood
Type A, Variety 2:													
4.01	32.7	23.6	15.3	9.1	12.9	4.9	6.5	7.1	1.6	1.3	Triang	Biconvex	Norwood
23.07	28.0	17.0	12.1	11.0	14.1	6.6	4.9	4.6	1.7	2.4	Triang	Diamond	NT Norwood
84.01	49.8	23.6	15.3	11.9	9.4	4.8	7.1	6.9	1.7	1.2	Triang	Lentic.	HT Norwood
176.02	(10.7)	NA	NA	(10.7)	16.8	4.5	NA	NA	NA	NA	Indeter	Indeter.	GL
Type A, Variety 3:													
8.06	(9.3)	NA	NA	(9.3)	21.1	(4.8)	NA	NA	NA	NA	Indeter	Indeter.	HT Norwood
23.07	51.2	44.7	21.1	6.5	(15.3)	8.1	3.24	NA	1.7	NA	Ovate	Planocon.	Norwood
31.05	(15.4)	NA	NA	(15.4)	20.3	(4.5)	NA	NA	NA	NA	Indeter	Lentic.	HT GL
34.03	59.9	48.2	24.5	11.7	21.8	7.0	NA	6.7	NA	4.0	Triang	Lentic.	Norwood
71.01	42.3	34.5	17.8	7.8	17.1	6.9	5.5	5.6	1.6	1.2	Triang	Biconvex	GL
75.01	(10.2)	NA	NA	(10.2)	20.5	(4.6)	NA	NA	NA	NA	Indeter	Indeter	HT GL
154.01a	(39.9)	(31.3)	(22.0)	8.6	(15.5)	(5.1)	NA	5.4	NA	4.3	Triang	Lentic.	Norwood
154.01b	(24.3)	(15.0)	24.3	9.3	22.3	6.2	5.8	5.4	3.2	3.3	Triang	Planocon.	Norwood
164.01	(10.7)	NA	NA	(10.7)	(16.7)	(4.1)	NA	NA	NA	NA	Indeter	Indeter	Norwood
198.00	(9.8)	NA	NA	(9.8)	24.5	(5.7)	NA	NA	NA	NA	Indeter	Biconvex	GL

Table 35 (cont'd).

Acc. No.	Total Length	Blade Length	Blade Width	Haft Length	Haft Width	Max. Thick.	Notch Width Right	Notch Width Left	Notch Depth Right	Notch Depth Left	Blade Shape	Cross Section	Raw Material
Type A, Variety 4:													
8.06	36.7	25.9	25.1	10.8	25.6	4.8	5.0	5.4	3.4	3.2	Triang	Biplano	Onondaga
145.01	47.0	37.5	23.1	9.5	(18.0)	5.3	4.6	NA	3.7	NA	Triang	Lentic	Bayport
200.00	(34.1)	(28.1)	24.5	6.0	21.0	5.4	2.5	2.0	2.2	3.0	Triang	Planocon	Onondaga
Type B, Variety 3:													
103.02	31.3	24.3	16.2	7.0	14.8	5.8	5.1	4.3	1.7	2.1	Triang	Planocon.	GL
Type B, Variety 4:													
28.20	22.7	17.7	12.1	5.0	9.9	4.8	2.8	2.6	2.7	2.0	Triang	Biconvex	HT GL
Type B, Variety 5:													
50.02	45.0	34.7	27.1	10.3	18.0	7.1	5.2	7.0	1.7	4.0	Pentag	Planocon	HT Norwood
Type A, Variety 5a:													
37.04	39.4	24.6	24.4	14.8	26.0	9.7	8.1	8.1	2.7	3.0	Ovate	Biconvex	HT Norwood
Type A, Variety 5b:													
62.02	26.1	14.2	27.3	11.9	26.9	9.3	7.5	8.7	2.3	2.6	Triang	Biconvex	HT Norwood
198.00	(22.0)	(11.8)	30.2	10.2	24.2	6.2	7.8	6.8	4.9	5.6	Triang	Biconvex	Onondaga

Table 35 (cont'd).

Acc. No.	Total Length	Blade Length	Blade Width	Haft Length	Haft Width	Max. Thick.	Notch Right	Notch Width Left	Notch Depth Right	Notch Depth Left	Blade Shape	Cross Section	Raw Material
Type B, Variety 1:													
7.12	36.7	27.8	22.3	8.9	18.8	5.5	4.0	4.5	2.6	3.6	Triang	Biplano	Exotic
Type B, Variety 2:													
9.01	29.5	21.0	18.0	8.5	(12.0)	5.7	6.4	NA	4.0	NA	Triang	Biconvex	HT Norwood
40.04	42.0	31.0	17.5	13.90	3.0	6.0	3.8	3.0	3.6	3.7	Triang	Biconvex	HT Norwood
Type A, Variety 6:													
200.00	24.0	14.5	17.2	9.5	(14.3)	5.5	5.1	NA	1.2	NA	Triang	Biplano	Bayport
Type A, Variety 7:													
95.02	22.0	12.0	14.6	10.0	12.3	6.6	6.1	6.1	2.4	1.9	Triang	Biconvex	HT Norwood

(Cleland n.d.a.). A straight base is present on the third specimen (53.02). The bases of all of the specimens are thinned, but not ground. Shallow expanding flakes dominate the secondary retouch. Some discontinuous marginal retouch is also present on the members of this variety. One specimen (53.02) is retouched on the dorsal surface only except for the thinning of the base. Additionally, one specimen (9.03) exhibits an impact fracture. Both specimens are manufactured from thin flakes.

This variety of projectile point is considered to belong to the Late Woodland occupation of the site. Except for the shallow side notching, these specimens display a general similarity to some of the larger triangular projectile points recovered from other Late Woodland sites in northern Michigan such as Pine River Channel (Holman 1978).

Type A, Variety 2 (Figure 68; Table 35): The projectile points assigned to this variety are medium in size with narrow triangular blades. Blade edges tend to be slightly excurvate and cross-sections are biconvex. The haft element is characterized by broad, shallow side notching and an excurvate base. The bases are thinned, but not ground. Shallow expanding and linear flaking characterizes the secondary retouch. One specimen (84.01) also exhibits delicate, bifacial tertiary retouch along both blade margins. The blade of a second specimen (23.01) has been extensively resharpenered. All three specimens are manufactured from flakes. In addition, a small base fragment broken at mid-notch has also been assigned to this variety.

Temporal placement of this variety is problematic. The members of this category share some similarity with the Lamoka/Dustin cluster of projectile points (Binford and Papworth 1963:105; Harrison 1966; Justice 1987:127-130; Ritchie 1971:29-30, 82-85). There are, however, several important differences between the two groups. Two of the specimens in Variety 2 are relatively thin and lack the distinct medial ridge which is characteristic of the Lamoka/Dustin type. The chipping on the specimens from the Skegemog Point site is also better executed than is typical for the Lamoka/Dustin type. While not numerous in the region, projectile points classified as Dustin points have been recovered in small numbers from a number of sites in northern Michigan, including the Juntunen site (McPherron 1967:153-154), Fauver site (McGonagle n.d.), and the O'Neil site (Lovis 1973:137-140). In all of these cases they were interpreted to be Late Archaic in age. In contrast, a similar projectile point, recovered at the Middle Woodland Holtz site, was considered to be a late Middle Woodland to Late Woodland variety (Lovis 1973:57-59) based upon similarities with specimens from the upper levels of the Schultz site in the Saginaw Valley (Fitting, ed. 1972). Therefore, although the exact temporal placement of this variety is not clear, it does appear that they do predate at least the later portions of the Late Woodland occupation of the Skegemog Point site.

Type A, Variety 3 (Figure 68; Table 35): Three complete specimens, two broken ones and five small haft fragments have been assigned to this variety. They are relatively thin side notched points with large triangular blades. Cross-sections tend to be either

lenticular or plano-convex in shape. The shoulders are straight. The haft element is relatively short and the notches are broad and deep. The metric dimensions of the breadth and depth of the notches tends to be equal. In all cases the bases are straight and thinned to varying degrees. Shallow linear and expanding flaking characterizes the secondary retouch. Primary flake scars are generally obliterated.

Evidence of manufacturing, rejuvenation, and discard trajectories are exhibited by the members of this variety. The base of one specimen (71.01) has not been completely thinned and the final notching may not have taken place. Remnants of the striking platform of the linear flake used to manufacture this point are present on the base. The left basal ear of a second specimen (23.07) appears to have been lost during attempts to thin its base. At some point during its use life, specimen 34.03 also lost one of the basal ears. In this case, the base was reworked giving it an indented appearance. A number of specimens display evidence of catastrophic failure resulting from impact. In one case (154.01) the blade is simply snapped in half, while in the second (154.01), the right lateral third of the tool has been lost. One of the haft fragments (31.05) also shows an impact fracture at mid-notch, while two others (8.06 and 164.01) exhibit irregular fracture lines of undetermined origin. The small haft fragments are believed to represent specimens broken during use and discarded as part of retooling activities.

The members of this variety belong to a broadly defined group of projectile points which are usually simply termed Late Woodland Side Notched (Converse 1973; Wahla 1981) or Raccoon Notched points (Justice 1987:218-220; Mayer-Oakes 1955). This type, though widespread, appears to be a minor component of Late Woodland projectile point styles. Single specimens have been recovered from the Juntunen (McPherron 1967:Plate XXXIII, h) and Sposito (Fitting and Cushman 1974:177-178) sites in the Straits of Mackinac region. Within the Traverse Corridor they occur at Wycamp Creek (Lovis n.d.a.), Ponshevaing Point (Lovis n.d.b.), Pine River Channel (Holman 1978:332-336), Henderson-Lamb, and Schuler. To the south, similar points are reported from the Porter Creek, South site (Holman and Hambacher 1989), the Spring Creek site (Fitting 1968a:42-45), and the West Twin Lake mound (Hinsdale 1930:Plate XXXII).

This variety of side notched point appears to be relatively short lived, dating primarily to the early Late Woodland and possibly terminal portions of the Middle Woodland period. Many of the sites noted north of the Skegemog Point site have significant early Late Woodland occupations. At the West Twin Lake Mound in Montmorency County a cache of ten side notched points were found with other tools in an affinis Wayne tradition vessel (Hinsdale 1930:128, Plate XXXIII). A burial from this mound has been radiocarbon dated to A.D. 950 $\pm$ 100 (M-1804) (Fitting 1975:169-170). The Spring Creek site has also been radiocarbon dated to the tenth century A.D. (Fitting 1968a:10). Further afield, similar projectile points are associated primarily with the Kipp Island phase in New York. They appear around A.D. 500 and disappear by A.D. 1000 (Ritchie 1980:234-253).

Type A, Variety 4 (Figure 69; Table 35): The three specimens assigned to this variety are medium sized projectile points with broad, thin triangular blades and short haft elements. The blade edges are straight and the cross-sections are characteristically lenticular to plano-convex in shape. The haft elements are characterized by narrow, deep U-shaped side notches. One of the specimens is double notched. The notches are placed low on the haft producing narrow basal ears which are rounded. Bifacial thinning of the bases is present on two of the specimens, but none are ground. The base of the third specimen was not finished. Base shapes are straight on two specimens and excurvate on the third specimen. Remnants of broad, shallow expanding primary flaking is present on the blades. Final retouch consists of short linear and rectangular flakes removed along the blade margins by pressure flaking. One specimen (200) exhibits an impact fracture at mid-blade, while a second specimen (8.06) has been extensively resharpened. All of the specimens recovered from the Skegemog Point site are manufactured from nonlocal cherts; Onondaga chert (N=2) from the Niagara frontier region and Bayport chert (N=1).

Type A, Variety 4 projectile points conform to the Meadowood type (Ritchie 1971:35-36, 89), which is diagnostic of the Meadowood phase dating between 1300 B.C. and 500 B.C. (Granger 1978:25-28; Ritchie and Funk 1973:116). In northwest Michigan similar points have been recovered from the Eastport site where they were named Davis points (Binford and Papworth 1963:100-102). Davis points exhibit close similarities to the Hunt and Hodges types from the Saginaw Valley (Binford 1963:129-134). In turn the close similarity between the Hunt/Hodges/Davis cluster and the Meadowood point has been noted by a number of people (Clark 1984:146; Granger 1978:35-41; Ozker 1982).

Regardless of the name used, the types are temporally coeval. Meadowood-like points have been dated to 3170 ± 300 B.P. at the Andrews site (Papworth 1967:20) and 2850 ± 110 B.P. at the Naugle site (Ozker 1976:341) in the Saginaw Valley. Additional dates of 2880 B.P. and 2770 B.P. have been associated with Meadowood points at 20BY79 in Bay City, Michigan (Lovis and Robertson 1989). Meadowood points manufactured from Onondaga chert also have been dated to 2515 ± 145 B.P. at the Conservation Park site (Luke et al. 1979:46) in Gratiot County. It should be noted that the double notched variety of Meadowood point is common at the Conservation Park site (Luke et al. 1979).

Type A, Variety 5a (Figure 69; Table 35): This variety is represented by single specimen. It is a short, thick projectile point with broad, deep, U-shaped side notches. The blade is triangular with slightly excurvate margins and exhibits evidence of resharpening. Its cross-section is biconvex and the shoulders are horizontal. The base of the haft is straight, bifacially thinned and heavily ground. The lateral edges of the base and the notches are also ground. The basal ears are relatively large and squared. Resharpening of the blade has obscured the original flaking patterns. Shallow lamellar flake scars cover the blade.

Typologically, this specimen can be assigned to the Raddatz Side Notched point type (Justice 1987:67-69; Wittry 1959:44-46). The Raddatz type is the Upper Great Lakes variant of a number of projectile point styles forming a cluster of points highly diagnostic of the Middle Archaic period between 6000 B.C. and 3000 B.C. (Justice 1987:67-69). Also included in this cluster are Otter Creek points in New York (Ritchie 1971:40-41, 94-98), Newton Falls Side-Notched points in Ohio (Prufer and Sofsky 1965:23-34), Godar points (Cook 1976) and Graham Cave Side Notched points (Logan 1952) from the Illinois and Missouri region, to name a few. Secure dates for the Raddatz type are not numerous. In Wisconsin they occur as early as circa 4500 B.C. at the Raddatz Rockshelter and persist into the Late Archaic levels (Wittry 1959:60). In the Saginaw Valley of Michigan, stylistically similar projectile points occurred in a sealed deposit at the Weber I site (20SA581). Radiocarbon dates from that zone range between 4560 ± 200 B.P. and 6230 ± 190 B.P. (Lovis and Robertson 1989).

Type A, Variety 5b (Figure 69; Table 35): One fragmentary specimen and one heavily resharpened specimen comprise this variety. They appear to have been medium sized projectile points with triangular blades and horizontal shoulders. Side notching is broad and of variable depth. The bases are straight and have been bifacially thinned, but not ground. Due to the fragmentary and reworked condition of the specimens not much can be said concerning the flaking patterns other than they do not appear to have been marginally retouched.

The specimens from the Skegemog Point site bear closest affinity to the generalized side and corner notched forms associated with the Late Archaic period. Such points are generally associated with the Brewerton Side Notched series (Ritchie 1940, 1971:19-20, 72) from New York or simply referred to generically as Archaic Side Notched points (Converse 1973:18). In southwestern Michigan, similar side notched projectile points have been termed Eidson Side-notched (Clark 1984:137-138). These points are considered to span the Late Archaic period and persist at least into the earlier portions of the Early Woodland period as indicated by a radiocarbon date of 780 B.C. ± 100 from the Eidson site (Clark 1984:137). They are also considered to be contemporaneous with and related to the Berrien Corner-notched type which persisted possibly as late as the Middle Woodland period (Clark 1984:137-145).

Type A, Variety 6 (Figure 69; Table 35): This variety is represented by a single specimen. It is a small, nearly equilateral triangular projectile point with shallow, weakly defined side notches on the proximal third of the blade. It has a biplano cross-section and a straight base. Secondary retouch consists of short pressure flaking along the margins of the specimen. Notching is bifacial. It is manufactured from Bayport chert and is heavily patinated.

Temporal placement of this specimen is unclear. However, its heavy patination indicates that it is associated with a pre- Late Woodland occupation of the site.

Type A, Variety 7 (Figure 69; Table 35): The single specimen in this variety is a very small projectile point with a short triangular blade and broad side notches. It has a biconvex cross-section and a straight, unmodified base. The specimen was finished by pressure flaking.

This variety belongs to a group of highly variable Late Woodland arrow points. Type names for such projectile points are numerous. In the Ohio Valley and the Midwest they are typically referred to as Birdpoints (Converse 1973:72; Ozker 1976:62-63)). Within Michigan, similar points have been termed Late Woodland Notched or Side-notched (Luedtke 1978; Wahla 1981:3-5), Diminutive Notched (Clark 1984:161) for southwestern Michigan, and Juntunen Notched (McPherron 1967:148-153) in the Straits of Mackinac region.

Type B, Variety 1 (Figure 70; Table 35): A single specimen represents this variety. It is a medium-sized projectile point with a moderately broad triangular blade. The blade has a biplano cross-section and the lateral margins are alternately beveled. The shoulders are well developed and slightly barbed. Its haft is straight based and has short squared ears created by the placement of the corner notches slightly above the base. Further, the base is thinned, but not ground. Primary flaking consists of shallow conchoidal and expanding scars. Secondary retouch is limited to the linear pressure flaking which used to bevel the edges of the tool. Minor impact damage is present on the distal end of the projectile point.

Typological placement of this specimen is unclear at this time. Broad similarities between this specimen and several of the specimens classified as Berrien Corner-Notched at the Eidson site (Clark 1984:138-145). This morphologically diverse group of projectile points are considered to span the Late Archaic to Middle Woodland periods.

Type B, Variety 2 (Figure 70; Table 35): This type has been retained from the original classification (Cleland n.d.a.) and is represented two specimens. Both are small to medium sized points with triangular blades of varying length. The blades of both specimens are slightly excurvate and barbed. Corner notching is relatively broad and deep. The base of one specimen is excurvate. The second specimen is fragmentary, but it too appears to have had an excurvate base. Final retouch consists primarily of well controlled lamellar pressure flaking. Flake scars tend to meet along the mid-line of the blade.

Although thinner, the specimens assigned to this variety are similar to corner notched specimens illustrated by Prah (1970:156) from the Hardy Dam Mound, the Brooks Mound group, and the Toft Lake Village site in Newaygo County. This group of sites has been identified as members of the Middle Woodland Goodall focus (Prah 1970:390). At the Pine River Channel site five similar specimens were present (Holman 1978:332, 336) and one specimen was also recovered at the Ponshevaing

Figure 70. Class I, Type B Notched Projectile Points

Row 1: (Specimen 1) Variety 1

Row 1: (Specimen 2-3) Variety 2

Row 2: (Specimen 1) Variety 3

Row 2: (Specimen 2) Variety 4

Row 2: (Specimen 3) Variety 5

Figure 71. Class II Stemmed Projectile Points

Row 1: (Specimens 1-4) Type A, Variety 1

Row 1: (Specimen 5) Type A, Variety 2

Row 2: (Specimens 1-6) Type B, Variety 1

Row 2: (Specimen 7) Type C

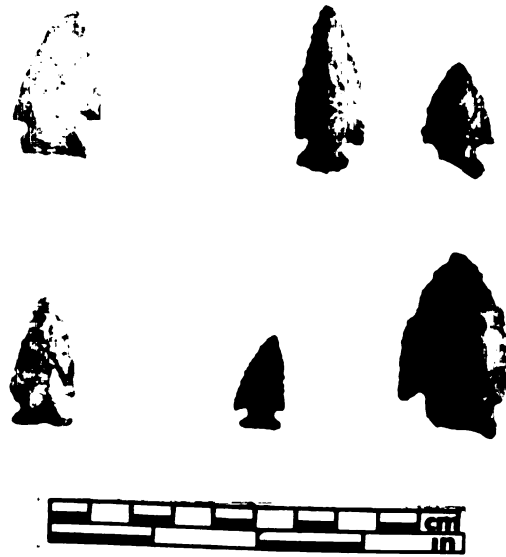


Figure 70.

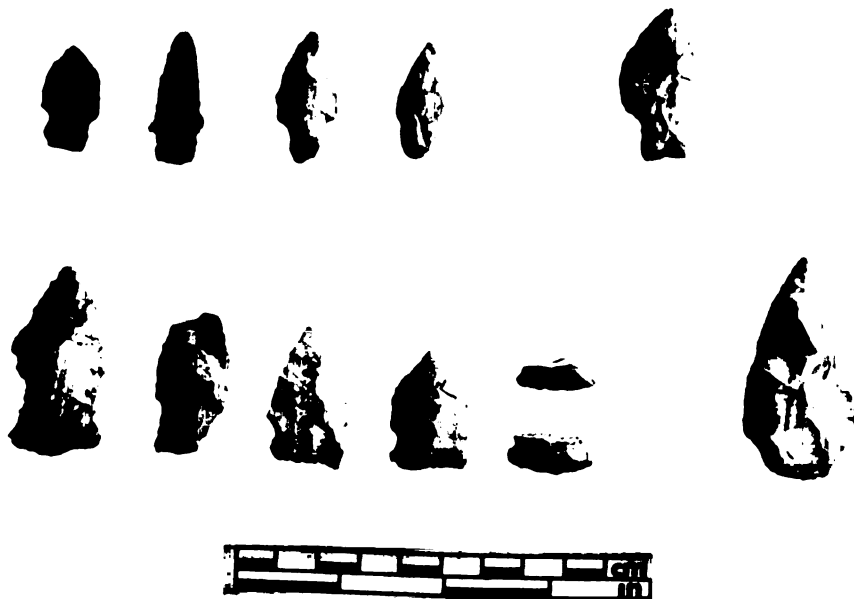


Figure 71.

Point site (Lovis n.d.b.). Their presence at Skegemog Point, Ponshevaing Point, and Pine River Channel suggest that this point style may persist through the transition to the early Late Woodland period.

Type B, Variety 3 (Figure 70; Table 35): A single specimen has been assigned to this variety. It is a medium sized projectile point with a narrow triangular blade, slightly tapered shoulders and a straight base. The blade has a plano-convex cross-section. Corner notching is broad and moderately deep creating small rounded basal ears. The base and notches are extensively ground. This specimen is retouched primarily on the dorsal surface. Retouch on the ventral surface consists of very short pressure flaking along the very margin of the tool. It is manufactured from a medium quality tan glacial chert and is patinated.

This variety of projectile point does not display any clear affiliation with any currently defined point types. The nature of the corner notching and the heavy grinding of the base are, however, reminiscent of some of the Late Archaic point styles. A pre-Woodland placement of this specimen is also suggested by its patinated surface.

Type B, Variety 4 (Figure 70; Table 35): A single small corner notched arrow point represents this variety. It has a slightly asymmetrical triangular blade with a biconvex cross-section, and well defined delicate barbs. The notches are deep and moderately broad, while the base is straight and unground. Shallow, narrow, lamellar pressure flake scars meeting along the mid-line of the blade characterize the final retouch of the specimen. The retouch also gives the blade margins a slightly serrated appearance. It is manufactured from a small flake.

Variety 4 is another variant of the small notched Late Woodland arrow points. This particular specimen displays very close affinities to the Koster Corner Notched point (Perino 1971:100-101). This point type was defined at the Koster site where it dates between circa A.D. 650 and A.D. 900.

Type B, Variety 5 (Figure 70; Table 35): The single specimen assigned to this variety is a large, asymmetrical projectile point. The blade is thin, relatively broad, and slightly pentagonal in shape. One shoulder has a large pronounced barb, while the other shoulder is horizontal and weakly defined. The shoulder shapes are the result of the asymmetrical placement of the corner notches; one is a deep, moderately broad notch and the other is very broad, shallow and poorly defined. It is manufactured from a large, flat side struck flake.

It is not possible to confidently assign this artifact to any known point style. The shape and orientation of the notches and the blade is somewhat reminiscent of the Jack's Reef Corner Notched type (Ritchie 1971:26-27, 78-79). This particular type is generally considered to date between circa A.D. 500 and continuing possibly as late as A.D. 1000 (Ritchie 1980: 228, Justice 1987: 217). Thus, the Skegemog Point specimen can be considered to be associated with the early Late Woodland occupation of the site.

Class II: Stemmed Projectile Points

This class of projectile point also exhibits a broad range of variability, although it is not as diverse as the notched group. The 12 stemmed specimens recovered at the Skegemog Point site have been subdivided into three types based on overall base shape (i.e., straight, expanding, or contracting stems). These, in turn, were subdivided into a number of varieties. Varieties were defined primarily by variation in the blade form. A number of time periods are represented by these stone tools.

Type A, Variety 1 (Figure 71; Table 36): Four specimens have been assigned to this category. They are manufactured on linear flakes, have a range of blade shapes, and typically exhibit a minimum of retouch. Blades tend to be triangular in shape and cross-sections are plano-convex to biplane. One specimen (50.01) has small, horizontally barbed shoulders. All of the specimens have relatively narrow hafts. Bases are rounded on two specimens and straight on the other two. All of the specimens are manufactured from small, minimally modified flakes. In three cases the retouch is limited to the margin of the specimen. The retouch is bifacial in two instances, but on one specimen (171.01) it is largely restricted to the haft. On the third point the retouch is restricted almost exclusively to the ventral surface. The fourth point (171.01) in this group exhibits extensive bifacial retouch. This has removed all traces of the primary flake surface. Retouch is irregular on this specimen.

This variety conforms closely to McPherron's (1967:148-153) Juntunen Notched type. Juntunen Notched points are characterized by minimal retouch on the flake blank and are considered highly diagnostic of the Late Woodland period. Data from the Juntunen site suggests that there might be a slight drop off in the popularity of this point style during the later portions of Late Woodland period (McPherron 1967: 152). Similar projectile points have also been recovered from the O'Neil site (Lovis 1973: 137-139).

Type A, Variety 2 (Figure 71; Table 36): The single tool in this variety is a medium sized projectile point with an ovate blade, rounded shoulders, and a biconvex cross-section. It has a narrow stem with straight sides. The base is also straight and has been lightly ground. Final retouch consists of linear pressure flaking. The blade appears to have been resharpened and the distal end exhibits edge attrition suggestive of use as a cutting tool.

Overall, this specimen is most similar to the Bottleneck Stemmed point type (Converse 1973:43; Justice 1987:124-127). In Ohio, such points are considered to be Late Archaic in age. Somewhat similar projectile points have been dated to between 3800 and 3000 B.C. at the Koster site (Justice 1987:126) where they were referred to as Apple Blossom points (Cook 1976:147-148). Although it has a straight stem rather than an expanding stem, the specimen from the Skegemog Point site is considered to belong to a Late Archaic occupation of the site.

Table 36. Class II: Stemmed Projectile Points

Acc. No.	Total Length	Blade Length	Blade Width	Haft Length	Haft Width	Max. Thick.	Blade Shape	Cross-Section	Raw Material
Type A, Variety 1:									
50.01	33.4	25.4	13.6	8.0	10.1	4.3	Triang	Lentic	HT GL
51.01	25.6	16.1	14.0	8.5	10.9	4.4	Triang	Planocon	HT GL
171.01	29.0	13.2	12.8	15.8	9.7	4.4	Triang	Biplano	HT GL
177.01	32.5	21.3	15.5	11.2	13.1	6.1	Triang	Biconvex	HT Nrwood
Type A, Variety 2:									
67.05	37.9	25.3	22.8	12.6	12.5	8.0	Ovate	Biconvex	HT GL
Type B, Variety 1:									
8.07	33.2	13.5	20.3	9.7	17.9	7.5	Triang	Biconvex	HT
Norwood									
10.02	45.2	25.2	24.1	20.6	22.4	9.0	Triang	Biconvex	Norwood
67.05	(34.6)	(22.6)	18.5	12.0	11.9	6.7	Triang	Lentic	Norwood
163.02	29.0	20.0	19.4	9.0	18.9	7.4	Triang	Biconvex	Norwood
29.05	(7.3)	NA	NA	(7.3)	20.1	(6.0)	Indeter	Indeter	GL
154.03	(10.1)	NA	NA	(10.1)	21.1	(5.7)	Indeter	Indeter	Norwood
Type C:									
5.04	54.6	44.8	27.8	9.8	21.9	7.4	Triang	Lentic	GL

Type B, Variety 1 (Figure 71; Table 36): Six specimens (3 complete, 1 broken, and 2 small haft fragments) have been placed in this variety. They are characterized by broadly expanding stems, weak shoulders, and triangular blades of varying lengths. In one case, the blade is nearly ovate in shape. Cross-sections are usually biconvex in shape. The hafts are relatively broad in relation to the blade of the specimen. In two cases (10.01 and 67.05) the bases are slightly excurvate, while the other two are straight. The specimens in this category display a range of quality in their manufacture. Secondary retouch consists of a combination of expanding and carefully placed linear pressure flakes. One specimen (10.02) has been heavily resharpened with coarse conchoidal flaking. The distal end of specimen 67.05 exhibits severe impact damage.

These projectile points have been assigned to a broad group of expanding base points which span from the late Middle Woodland to Late Woodland periods. To the north, similar projectile points were classified as Burnt Bluff expanding stem (Cleland and Peske 1968:22-24) and related to Mason's (1967) Middle Woodland North Bay Complex. South of the Traverse Bay region similar points have also been reported from Middle Woodland contexts in both Newaygo County and the Saginaw Valley. Prahl (1970:Plate LXV) illustrates similar specimens from the Jancarich site, but does not give them a typological affiliation. At the Schultz site, expanding stem points persist into the Late Woodland levels of the site (Fitting, ed. 1972:215). Further indication of the persistence of this generalized type into the Late Woodland period comes from Illinois and Ohio. In the former area, the Lowe flared base type replaces the classic Middle Woodland corner-notched point around A.D. 200 and persists until A.D. 600 (Winters 1967:90-92). The very similar Chesser Notched type identified in Ohio also appears during the terminal portions of the Middle Woodland period and persists until at least A.D. 700 (Prufer 1975:21).

Type C, Variety 1 (Figure 71; Table 36): A single projectile point has been assigned to this variety. It has a large, thin, broad triangular blade with inversely tapered shoulders and a lenticular cross-section. The haft is also broad, but short with contracting lateral edges and a straight base. Primary flaking consists of broad, flat, expanding scars with intermittent retouch along the margins of the specimen. The distal half of one lateral edge exhibits tiny scarring and attrition which may be indicative of usage as a bifacial knife.

Temporal placement of this point is not clear. The broad blade and contracting stem is reminiscent of some of the broad bladed forms dating to the terminal Archaic period. Those specimens, however, tend to be more crudely chipped. This, in conjunction with the use-damage along the blade, may indicate that functioned primarily as a hafted biface associated with the Late Woodland occupation of the site.

Class III: Triangular Projectile Points

A total of 66 triangular points were recovered at the Skegemog Point site, making it the most numerous projectile point form encountered at the site. The members of this class have been subdivided into four basic types distinguished by the shape of their lateral and basal margins. Within each type the specimens are homogeneous. Specimens differ primarily in terms of the degree of retouch employed. Differences in overall dimensions and cross-section are minor (Table 37). All of the specimens within this class are manufactured from small to medium sized flakes.

The differentiation of members of this class from triangular bifaces, particularly the smaller variety, presented some minor difficulties. This problem was also recognized by McPherron (1967:148) with the Juntunen site lithic assemblage, which is of comparable size and diversity. These two tool forms obviously share many primary attributes of overall shape, metric dimensions, and chipping style. Reliance had to be placed on the attributes such as asymmetrical resharpening and the presence of use damage. Particular attention was paid to the extent of any use damage present on a tool. Those triangular projectile points which appear to have functioned secondarily as bifacial knives are noted in Table 37.

Type A, Variety 1 (Figure 72; Table 37): A total of 22 whole and fragmentary specimens were recovered at the Skegemog Point site. They are relatively short, thin triangular points with a mean length:width ratio 1.5. They invariably have straight edges and straight bases. Only three specimens exhibited clearly excurvate lateral edges. Cross-sections are predominantly lenticular in shape, although two specimens retain a slight medial hump resulting from incomplete thinning. All of the specimens exhibit extensive bifacial retouch. Secondary chipping is quite variable, but it tends to be flat and randomly oriented. The majority of the specimens also exhibit continuous tertiary retouch along the tool margins. There is a clear preference for Norwood chert in this class of projectile point.

Seven specimens exhibited evidence of use damage. In three instances it consists of fractures resulting from impact. Resharpening and use retouch is evident on three specimens. The tip of the sixth specimen is polished and rounded from use as a perforator.

The specimens in this variety are typically referred to as Madison points (Ritchie 1971:33-34, 88; Scully 1951:14). This type is ubiquitous throughout the eastern and midwestern parts of the United States and is considered a hallmark of the Late Woodland period after A.D. 800 (Justice 1987:227).

Type A, Variety 2 (Figure 73; Table 37): This variety is differentiated from Variety 1 by the technique of manufacture. They are characterized by a minimal amount of retouch restricted to the margins of the ventral face. The dorsal face, however, typically shows more extensive retouch. Only 11 of the 24 specimens in this group

- Figure 72.** **Class III, Type A, Variety 1 Triangular Projectile Points**
- Figure 73.** **Class III, Type A, Variety 2 Triangular Projectile Points**

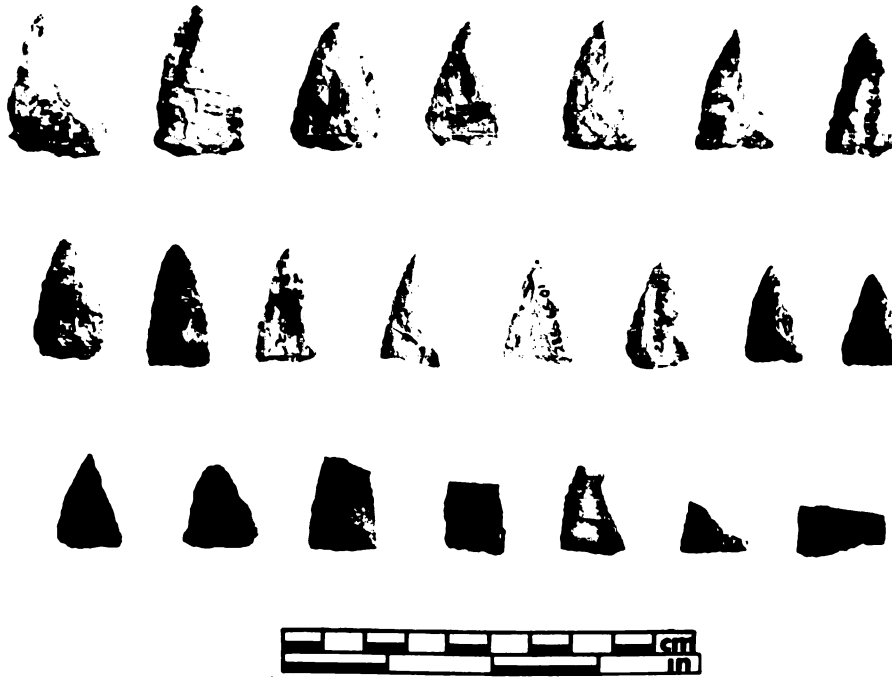


Figure 72.



Figure 73.

Table 37. Class III: Triangular Projectile Points

Acc. No.	Length	Width	Thick.	Cross-Section	Raw Material
Type A, Variety 1:					
2.01	32.0	20.0	5.1	Planoconvex	Norwood
4.05	29.8	16.0	4.5	Planoconvex	Norwood
6.04	(13.4)	22.4	4.6	Lenticular	HT Norwood
6.20a	30.8	19.7	6.3	Biconvex	HT Norwood
6.20b	31.2	18.4	5.2	Biplano	Norwood
8.03	37.1	23.4	6.0	Biplano	HT Norwood
45.03	22.8	15.2	5.7	Planoconvex	GL1
46.08	(12.9)	(17.0)	3.5	Lenticular	GL
51.08	(22.6)	16.8	4.7	Lenticular	HT Norwood
65.01a	27.9	15.7	4.0	Lenticular	HT Norwood
65.01b	25.7	18.2	5.0	Lenticular	Norwood
70.02a	28.3	15.2	4.9	Biconvex	Norwood
70.02b	(16.8)	15.2	4.4	Lenticular	HT Norwood
72.01	34.4	24.9	6.7	Planoconvex	Norwood
95.01	24.1	14.4	4.9	Lenticular	HT Norwood
162.01	20.0	18.6	4.3	Biplano	HT Norwood
163.01	(16.1)	21.0	3.2	Lenticular	HT Norwood
163.10	32.6	21.4	5.9	Lenticular	Norwood
171.01	32.6	19.1	5.1	Lenticular	HT Norwood
174.01	26.8	16.5	4.0	Planoconvex	Norwood
180.03	22.5	15.5	3.6	Biplano	HT Norwood
182.02	29.3	17.6	5.5	Lenticular	Norwood
Type A, Variety 2:					
4.01	28.8	18.6	3.4	Planoconvex	HT Cordell
6.09	27.7	(16.6)	3.4	Lenticular	Norwood
7.01	25.2	14.7	3.8	Planoconvex	Norwood
22.02	(28.4)	27.7	6.1	Planoconvex	Norwood
22.04	32.0	14.6	5.5	Triangular	HT Cordell
36.01	26.3	13.8	4.4	Lenticular	HT Norwood
38.05	19.8	14.0	3.0	Lenticular	HT Norwood
43.03	32.9	14.5	4.3	Planoconvex	HT Norwood
46.01	36.1	14.8	5.7	Planoconvex	Norwood
47.05	21.5	15.6	4.7	Planoconvex	Norwood
51.02	28.3	18.1	5.2	Wedge	HT Norwood
61.05	19.3	12.6	2.5	Lenticular	HT Cordell
70.02	25.2	15.2	3.3	Lenticular	HT Norwood
74.01	29.6	20.1	4.1	Lenticular	HT Norwood
74.02	35.1	19.7	7.8	Triangular	GL
77.01	32.3	14.1	5.4	Planoconvex	HT Norwood
81.02	41.0	22.5	6.7	Planoconvex	HT Norwood
84.03	24.8	16.1	3.4	Lenticular	HT Norwood
139.01	33.1	16.4	6.1	Biconvex	Norwood

Table 37 (cont'd).

Acc. No.	Length	Width	Thick.	Cross-Section	Raw Material
Type A, Variety 2 (cont'd).					
156.01	23.6	15.7	4.8	Biconvex	HT Norwood
177.01	30.8	15.3	4.3	Planoconvex	Norwood
189.01	(18.7)	14.8	3.2	Planoconvex	HT Norwood
000.00a	29.8	16.1	3.0	Lenticular	HT Norwood
000.00b	28.0	15.4	6.6	Planoconvex	HT Norwood
Type B:					
6.03	27.1	20.8	4.7	Planoconvex	GL
6.10	25.2	19.0	4.1	Lenticular	Cordell
16.01	53.6	28.1	6.5	Lenticular	Norwood
36.01	(17.4)	14.7	4.8	Lenticular	HT Norwood
46.06	(16.2)	14.0	3.7	Planoconvex	HT GL
50.02	25.5	15.7	4.3	Planoconvex	Norwood
61.05	(24.4)	17.2	5.4	Planoconvex	GL
68.02	(18.4)	17.3	4.8	Lenticular	HT GL
72.01	40.6	17.5	4.1	Lenticular	Norwood
74.01	47.7	(17.8)	5.0	Lenticular	Norwood
106.01	28.9	21.7	4.2	Biplano	Norwood
154.03	(10.7)	18.4	4.0	Lenticular	Cordell
161.02	34.5	(15.3)	4.8	Biplano	Cordell
172.01	23.3	15.5	3.7	Planoconvex	Norwood
177.01	(17.0)	18.5	3.9	Planoconvex	Norwood
177.03	(26.8)	17.8	5.1	Biconvex	HT Norwood
178.02	37.8	17.4	2.9	Lenticular	HT Norwood
Type C:					
28.04	40.6	21.4	4.7	Lenticular	Norwood
28.09	42.4	21.1	5.7	Lenticular	GL
Type D:					
2.06	57.4	15.8	3.6	Lenticular	Cordell
38.07	42.4	11.6	5.8	Biconvex	GL

retained significant portions of the primary flake surface on their dorsal faces. The retouch tends to be well controlled. Edge shapes are often excurvate. The bases are straight except for three specimens (61.05, 77.01, and 177.01). Cross-sections are either plano-convex or lenticular in shape. All but two of these specimens are manufactured from flat flakes. The striking platforms are simple in the few instances where they are still present on a specimen. The two exceptions are manufactured on small blocky flakes. Again, Norwood chert is the preferred raw material.

Eight specimens show evidence of use damage. In most cases (N=5) it consists of use generated retouch in the form of minor rounding or polishing and attrition scarring along the distal portions of one lateral margin. One specimen shows evidence characteristic of use as a perforator and another specimen has been resharpened. Only one specimen shows evidence of impact damage.

Type A, Variety 2 projectile points are classic examples of the Juntunen Triangular type defined by McPherron (1967: 148-153). This type, also, is ubiquitous throughout the Late Woodland period and appears to be characteristic of the Upper Great Lakes region. Similar projectile points have been recovered at virtually every Late Woodland site which has produced projectile points. Included here are the O,Neil site (Lovis 1973:136-137), the Pine River Channel site (Holman 1978:312-315), Wycamp Creek site (Lovis n.d.a.), Ponshevaing Point site (Lovis n.d.b.) and the Schuler site (Master n.d.), to name a few.

Type B (Figure 74; Table 37): The 17 triangular points assigned to this category are distinguished by their incurvate bases. In a number of cases the bases are very sharply incurvate with carefully chipped basal tangs. The lateral margins of these points are invariably straight. Cross-sections are all thin and are either lenticular or plano-convex in shape. These specimens tend to exhibit extensive bifacial flaking. Secondary retouch consists of flat linear and expanding flakes. Virtually all of the specimens also exhibit continuous marginal retouch. As with the other types of triangular points, flakes of Norwood chert were the preferred raw material. These projectile points were originally classified as Class III, Type A by Cleland (n.d.a.).

Slightly over half of the specimens exhibited use damage. Clear impact fractures are present on five specimens. An additional four specimens show edge attrition not attributable to their use as projectiles.

This variety of triangular point appears to be a minority type in the Traverse Bay region. The highest frequency of occurrence is at the Skegemog Point site. Several similar specimens were recovered from the Pine River Channel site (Holman 1978:314). These points are assigned to the Late Woodland occupation. At this time it is unclear whether this type spans the entire Late Woodland period.

Type C (Figure 74; Table 37): This type is characterized by an ovate triangular shape with a straight base. The point of maximum width is located at the approximate mid-

- Figure 74.** **Class III, Type B, Type C and Type D Triangular Projectile Points**
 Rows 1-3: Type B
 Row 4: (Specimens 1-2) Type C
 Row 4: (Specimens 3-4) Type D
- Figure 75.** **Projectile Point Fragments**



Figure 74.

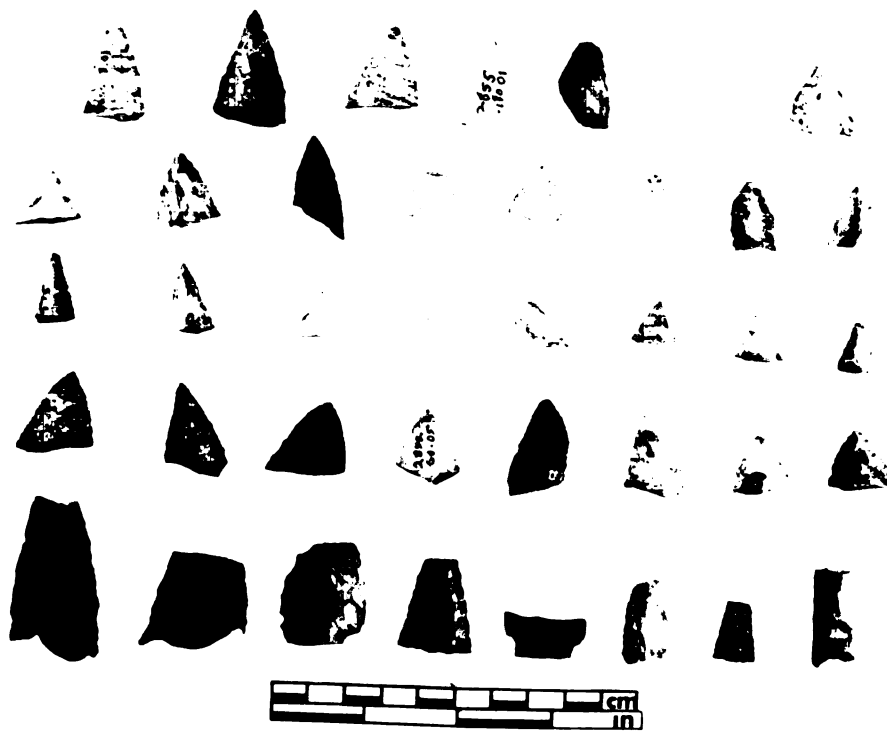


Figure 75.

point of the blade. Secondary retouch consists of flat expanding flakes with discontinuous marginal retouch. Two specimens have been assigned to this type. One specimen exhibits use damage along one its lateral margins. These points are assigned to the Late Woodland period.

Type D (Figure 74; Table 37): The two points assigned to this category are very distinctive. They have a narrow, willow leaf shape with broadly excurvate edges and rounded bases. These specimens are carefully chipped with secondary retouch consisting of flat expanding flakes. One specimen has delicate tertiary retouch along its margins.

These specimens have also been assigned to the Late Woodland period. They also occurred at the Pine River Channel site (Holman 1978:315).

Miscellaneous Projectile Point Fragments (Figure 75): Slightly less than one-third of the projectile points recovered at the Skegemog Point site consist of unclassifiable fragments. Distal end fragments (N=38) are the most numerous type of fragment. All of these, except one, have a sharply acute tip and thin lenticular cross-section characteristic of triangular projectile points, particularly Class III, Types A and B. Ten exhibit minimal marginal retouch. These are most likely derived from Juntunen Triangular points (Type A Variety 2). Clear evidence of impact damage was found on seven tip fragments and an additional ten displayed lateral edge damage suggesting their use as knives or other non-projectile functions. One specimen (4.01) was recycled as a wedge/chisel. The remaining specimens exhibit straight snap fractures, often along a lamination in the chert.

Seven mid-sections and a single base were also assigned to this group based on their shapes and flaking patterns. Four of the mid-sections, however, appear to be from large stemmed and notched forms more typically associated with the Archaic period. Subsequent recycling as wedges was evident on two of the mid-section fragments. The base fragment is a narrow, straight sided stem which was broken by impact.

As with all of the other formal tools at the Skegemog Point site, the overwhelming majority of these fragments were manufactured from Norwood chert. Only 11 specimens were not and in every case the raw material is mottled gray glacial chert.

Bifaces

A total of 267 whole and fragmentary bifaces were recovered at the Skegemog Point site. As classified here, bifaces include all of the formally bifacially flaked tools lacking distinctive haft elements and not classifiable to other specific morpho-functional groups (e.g., projectile points, drills, and endscrapers). The bifaces have, in turn, been subdivided into three primary groups or stages reflecting the sequence of manufacture and use. The initial two stages include those bifaces typically referred to as roughouts or preforms. These two stages account for slightly more than a third of the bifaces with

44 (16.5%) stage 1 and 62 (23.2%) stage 2 bifaces represented. The third stage includes 161 (60.3%) finished specimens. The differentiating features of each group are discussed below in the ensuing descriptions.

This division of the bifaces not only allows the reconstruction of the reduction strategy employed during the Late Woodland period, but also facilitates comparison with other reported lithic assemblages in the region. Functional attribution for bifaces is possible only at a very general level here. Such tools are suitable for a wide variety of cutting purposes and may be best viewed as the prehistoric counterpart to today's general utility knife.

Stage 1 Bifaces (Figures 76 and 77; Table 38)

Stage 1 bifaces represent the initial stages of shaping and forming, or "roughing out" of bifacial tools. These 44 bifaces typically are large and characterized by amorphous and irregular shapes, thick irregular cross-sections, steep edge angles, and coarse percussion flaking. Shape is primarily a function of the shape of the cobble or flake blank being employed. Ovate to ovoid and rectangular shapes predominate among these bifaces. Cross-sections are quite variable in shape and size, although there is a tendency towards thick, asymmetrically biconvex and trapezoidal cross-sections. Edge angles are relatively steep and average between 65 and 70 degrees. These angles, however, are not constant along any edge and may vary up to 25 degrees on any given specimen.

Determination of blank form was possible for 40 of the specimens. Nearly two-thirds of the blanks are large blocky flakes. Blocky decortication flakes and blocky secondary flakes are about equally represented with 12 and 13 specimens, respectively. Thirteen of the remaining 15 specimens are made from split chert cobbles. The remaining two tools are made from quarried blocks of chert. Norwood and its heat treated variant are by far the predominant type of chert used in the manufacture of bifaces (N=31). Thirteen specimens are manufactured from medium textured, mottled gray glacial chert.

Although there does not appear to be a rigid sequence to the initial removal of flakes from a biface blank, there does appear to be a tendency to begin by flaking the ventral and/or flattest face of the blank. This provided a better surface for the subsequent removal of flakes from the dorsal face (generally cortical flakes). Twenty specimens exhibit flaking primarily on the ventral face. Flaking began on the dorsal face of only seven specimens, while on 15 specimens the flaking alternates between faces. Flaking is accomplished exclusively by hard hammer percussion.

Identification of intended tool form is generally not possible at this stage of manufacture. However, one specimen (2.12) appears to be a drill blank and two specimens (9.01 and 155.01) appear to be blanks for endscrapers.

Figure 76. **Stage 1 Bifaces**

Figure 77. **Stage 1 Bifaces**

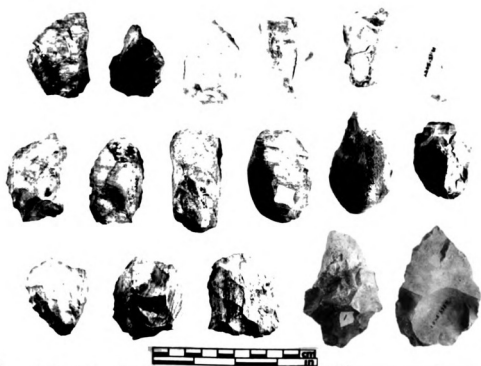


Figure 76.



Figure 77.

Table 38. Stage 1 Bifaces

Acc. No.	Shape	Cross-Section	Length	Width	Thick.	<R	<L	Blank	Raw Material
1.01	Ovate	Wedge	(25.4)	(34.7)	(18.2)	55	70	BD	HT Norwood
2.12	Rect	Diam	51.7	20.5	21.4	75	80	Block	Norwood
4.07	Rect	Triang	54.8	24.1	15.0	60	60	Cobble	Norwood
6.06	Ovoid	Wedge	59.7	39.5	23.7	75	UN	Cobble	Norwood
6.11	Ovate	Tabular	46.7	30.4	10.8	UN	55	BS	Norwood
6.18	Ovate	Bicon	(41.4)	28.7	18.1	100	75	Cobble	GL
7.12a	Rect	Trap	65.4	34.0	22.8	65	75	Cobble	HT GL
7.12b	Rect	Trap	(31.2)	31.0	17.1	75	55	Cobble	Norwood
8.02	Indeter	Tabular	(18.0)	(47.6)	(8.7)	—	—	BS	Norwood
9.01	Ovate	Triang	51.6	34.7	20.0	70	50	BD	HT Norwood
28.01	Rect	Planoccon	35.5	20.5	10.2	70	UN	BD	HT Norwood
28.07	Rect	Tabular	(42.3)	40.5	9.8	40	UN	BD	Norwood
31.01a	Ovate	Trap	51.7	30.8	16.2	80	65	Cobble	HT GL
31.01b	Ovate	Bicon	47.1	38.1	20.3	100	90	BS/BD	Norwood
38.06	Rect	Trap	44.0	30.2	19.0	70	65	Cobble	Norwood
42.09	Ovate	Triang	(31.4)	26.5	15.8	80	55	BD	GL
50.01	Ovate	Bicon	43.2	53.5	17.1	65	40	BD/BS	HT Norwood
51.02	Ovate	Planoccon	55.5	36.7	19.0	75	75	BS	Norwood
53.02	Ovate	Planoccon	56.0	34.6	16.2	65	50	Cobble	Norwood
61.01	Ovate	Bicon	(34.4)	(29.2)	(15.2)	—	—	BS	HT GL
68.02	Ovate	Trap	35.0	39.6	13.0	40	50	BD	HT Norwood
69.02	Indeter	Bicon	(35.4)	(15.5)	(18.0)	70	—	Indeter	GL
70.02	Ovate	Trap	45.0	35.2	19.9	85	80	Cobble	GL
72.01	Rect	Plano	48.0	52.4	19.0	45	65	BD	Norwood
83.03	Ovate	Trap	71.0	48.3	27.3	80	75	Cobble	HT Norwood
84.01	Ovate	BD	51.4	27.6	12.7	80	55	BD	Norwood
84.03a	Indeter	Bicon	(27.3)	(29.3)	(15.5)	—	—	Indeter	HT Norwood
84.03b	Ovate	Tabular	75.2	59.0	18.3	70	UN	BS	GL
93.02a	Circ	Bicon	46.4	51.0	21.0	70	70	BS	Norwood
93.02b	Rect	Tabular	54.3	43.6	16.2	65	70	BD	Norwood
104.02a	Triang	Triang	59.3	33.5	26.4	85	75	Cobble	GL
104.02b	Ovate	Planoccon	54.9	40.5	17.0	65	55	BD	GL
104.02c	Indeter	Bicon	(32.2)	(26.0)	9.1	60	—	Indeter	GL
104.02d	Ovate	Diam	55.0	29.6	17.5	75	75	BS	Norwood
106.01a	Rect	Rect	48.6	24.3	17.7	75	65	Block	HT Norwood
106.01b	Ovate	Bicon	(35.0)	(45.5)	15.1	65	50	BS	HT GL
155.01	Ovate	Triang	58.1	24.6	11.8	50	60	BS	HT Norwood
163.02a	Ovate	Tabular	65.0	40.4	16.4	70	60	Cobble	GL
163.02b	Indeter	Bicon	(42.7)	(27.0)	(13.8)	—	—	Indeter	Norwood
163.02c	Rect	Tabular	(45.7)	44.4	12.1	35	65	BS	HT Norwood
174.02	Rect	Triang	46.3	26.5	9.4	70	50	BS	HT Norwood
179.02	Square	Bicon	34.3	35.0	15.9	85	85	BS	Norwood
000.00	Rect	Rect	50.7	35.0	24.5	90	80	Cobble	Norwood
000.00	Ovate	Bicon	45.1	24.9	14.0	55	50	BD	HT Norwood

Finally, several stage 1 bifaces show evidence of expedient use at this stage. The lateral edge of one specimen exhibits heavy crushing and battering typically associated with wedges. The distal end of another specimen exhibits both crushing and attrition, possibly suggesting a heavy cutting function.

Stage 2 Bifaces (Figures 78 and 79; Table 39)

Stage 2 bifaces are fairly abundant with 62 specimens present in the assemblage. This stage shows the continued shaping and thinning of the biface blank and is intermediate between an initially roughed out tool and a finished biface. During this stage, plan and cross-sectional shapes become smaller, thinner, and more symmetrical. While metric dimensions may be reduced, they still exhibit relatively large ranges (Table 39). Shape could be determined for 41 specimens. Twenty five specimens are ovate which is, by far, the most common shape represented. Other shapes include triangular, rectangular/square, lanceolate, and circular, all of which occur infrequently. The variety of cross-sectional shapes is still broad, but biconvex and plano-convex shapes dominate at 62.5% and 16.1%, respectively. Edge angles average 55 degrees and tend to be more consistent along individual edges compared to stage 1 bifaces.

Chipping patterns are quite variable across the member specimens. Primary percussion flaking is largely completed during this stage. Secondary flaking is being initiated and is often restricted to one face and isolated areas of the opposing face. Flake scars tend to be flatter, more consistent in their orientation, and the product of a combination of hard and soft hammer techniques. It is also at this stage that the highest rate of catastrophic failure occurs. In contrast to the Stage I bifaces where 29.5% of the specimens were fragmented, approximately half of the broken stage 2 bifaces show clear evidence of manufacture related failures. The failures occur as hinge-through fractures and breaks along limey lamina in the chert. Norwood chert and its heat treated variant are the prevalent raw material type (N=43). Seventeen specimens are manufactured on glacially derived cherts, about half of which have been heat treated.

Only two specimens showed signs of use. In both cases it consists of light rounding and flaking of small portions of a single edge.

Stage 3 Bifaces

Stage 3 bifaces represent the final stage of manufacture. These are finished specimens lacking only the preparation of a formal haft element, where one is required. The hints of the forms suggested in the earlier stages are finally realized. The member bifaces are characteristically thin, have regular outlines, and are generally symmetrical. Secondary flaking is present over most of the surfaces largely obscuring the primary flake scars. All flaking is flat and shallow. Short, delicate marginal retouch occurs intermittently. Where it does occur, it is generally located on the distal portions of the biface and often along a single edge.

Figure 78. **Stage 2 Bifaces**

Figure 79. **Stage 2 Bifaces**



Figure 78.



Figure 79.

Table 39.

Acc. No.

1.04
1.08
2.01a
2.01b
4.01
4.05
4.07
6.09
6.10
7.01
8.07
12.01
19.02
23.01
23.09
23.10
28.03
28.05
28.10
28.12
31.01
32.01
37.04
38.07
40.04
44.01
44.04
44.06
44.09
45.02
45.07
46.07
51.01a
51.01b
52.01
59.01
65.02
68.02
72.01
81.02
82.02a
82.02b
83.01
84.02
84.03
87.01

Table 39. Stage 2 Bifaces

Acc. No.	Shape	Cross-Section	Length	Width	Thick.	<R	<L	Raw Material
1.04	Ovate	Bicon	(32.0)	26.0	11.3	50	65	GL
1.08	Indeter	Planocon	(20.2)	(15.4)	(13.9)	—	—	HT Norwood
2.01a	Ovate	Bicon	(35.0)	31.5	11.7	45	45	GL
2.01b	Triang	Planocon	33.5	22.3	7.4	35	40	Norwood
4.01	Indeter	Bicon	(28.6)	(15.3)	(9.5)	55	—	HT GL
4.05	Circ	Bicon	37.6	34.2	15.4	65	65	GL
4.07	Indeter	Bicon	(26.7)	(12.0)	(12.3)	70	—	HT Norwood
6.09	Triang	Planocon	41.0	28.3	7.2	65	50	GL
6.10	Indeter	Planocon	(25.8)	(13.5)	(9.4)	45	—	HT GL
7.01	Ovate	Planocon	(29.3)	(34.1)	(11.2)	55	50	HT Norwood
8.07	Indeter	Bicon	(33.8)	(15.9)	(10.4)	50	—	Burned GL
12.01	Indeter	Planocon	(26.5)	(16.6)	(13.0)	—	—	HT Norwood
19.02	Indeter	Bicon	(36.0)	(27.6)	(10.8)	60	—	HT Norwood
23.01	Rect	Trap	(26.6)	(33.4)	12.5	65	50	Norwood
23.09	Ovate	Bicon	(39.6)	(30.7)	11.8	55	60	Norwood
23.10	Ovate	Bicon	(25.8)	30.5	10.3	40	65	Norwood
28.03	Ovate	Biplano	(57.1)	44.9	11.5	50	55	Norwood
28.05	Ovate	Bicon	47.0	30.8	11.9	55	50	HT Norwood
28.10	Ovate	Bicon	63.0	31.5	16.2	70	60	Norwood
28.12	Ovate	Tabular	(46.3)	(41.2)	12.9	45	65	Norwood
31.01	Ovate	Bicon	(35.0)	38.0	13.5	50	55	HT Norwood
32.01	Triang	Trap	(34.1)	24.4	14.0	65	70	GL
37.04	Ovate	Lentic	40.0	(25.5)	9.4	40	—	HT Norwood
38.07	Ovate	Bicon	47.0	19.3	9.4	65	60	Norwood
40.04	Triang	Bicon	53.2	29.5	16.2	75	70	Norwood
44.01	Ovoid	Trap	35.1	25.1	12.2	55	UN	Norwood
44.04	Triang	Planocon	35.5	(23.7)	11.2	60	—	HT Norwood
44.06	Rect	Bicon	(37.9)	32.0	9.8	65	55	HT Norwood
44.09	Ovate	Planocon	(30.0)	22.7	10.4	65	80	Norwood
45.02	Lance	Bicon	(52.1)	30.5	11.4	45	50	Norwood
45.07	Triang	Bicon	(41.0)	33.0	11.2	40	50	Norwood
46.07	Indeter	Bicon	(21.6)	(28.6)	(14.8)	—	—	HT GL
51.01a	Ovate	Lentic	24.6	(38.4)	10.2	40	—	GL
51.01b	Rect	Diam	(36.0)	(13.6)	12.0	65	—	HT GL
52.01	Ovate	Wedge	41.4	27.1	14.4	40	60	Norwood
59.01	Indeter	Trap	(19.8)	(15.7)	8.9	70	—	HT GL
65.02	Indeter	Bicon	(13.4)	(19.8)	(10.8)	—	—	Norwood
68.02	Indeter	Bicon	(19.3)	(24.3)	(9.1)	—	—	HT Norwood
72.01	Indeter	Bicon	(36.6)	(10.8)	(11.2)	55	—	Norwood
81.02	Square	Bicon	26.1	22.5	12.5	60	60	Norwood
82.02a	Ovate	Bicon	(41.4)	36.0	14.4	65	50	HT GL
82.02b	Indeter	Bicon	(24.3)	(31.5)	(12.2)	—	—	Burn Norwood
83.01	Ovate	Bicon	50.9	26.6	10.7	50	50	GL
84.02	Ovate	Bicon	42.3	20.8	8.8	30	45	Norwood
84.03	Ovate	Bicon	(48.1)	27.8	10.6	40	40	HT Norwood
87.01	Ovate	Planocon	47.4	25.3	11.7	40	65	HT Norwood

Table 39 (cont'd).

Acc. No.	Shape	Cross- Section	Length	Width	Thick.	< R	< L	Raw Material
90.05	Ovate	Bicon	40.6	35.6	12.5	55	60	Norwood
91.03	Indeter	Trap	(35.8)	(23.6)	10.5	55	45	HT Norwood
92.02a	Indeter	Bicon	(16.7)	(26.2)	10.5	—	—	HT Norwood
92.02b	Indeter	Bicon	(31.7)	(29.5)	10.6	60	55	Norwood
97.02	Indeter	Bicon	(35.2)	(32.9)	12.0	40	45	Norwood
103.02	Indeter	Bicon	(30.6)	(18.5)	(11.5)	—	—	GL
104.02a	Ovate	Bicon	(30.3)	23.0	9.5	—	—	HT Norwood
104.02b	Indeter	Bicon	(36.7)	(16.3)	(8.2)	-	—	Burn Norwood
106.01	Indeter	Planocon	(32.0)	(11.1)	(9.5)	—	—	Norwood
153.02	Square	Bicon	40.0	38.5	19.2	75	65	Norwood
163.01	Indeter	Bicon	(28.0)	(22.0)	(10.6)	—	—	Norwood
164.03	Ovate	Bicon	61.2	36.7	17.6	65	60	Norwood
171.02	Lance	Bicon	72.0	28.3	15.4	65	60	Norwood
172.02	Ovate	Bicon	(57.4)	37.6	12.1	55	65	Norwood
176.01	Ovate	Bicon	(9.2)	(34.8)	(13.1)	—	—	GL
177.01	Ovate	Tabular	25.7	19.8	8.6	70	50	GL

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A total of 161 whole and fragmentary specimens have been classified as stage 3 bifaces. Although they represent the numerically largest category within the stone tool inventory, they are characterized by a limited number of generalized shapes.

These tools are generalized not only in terms of morphology, but also in terms of function. Functionally, the edge damage present on the specimens is suggestive of a wide range of generalized cutting, scraping and chopping activities. To facilitate the description and organization of this large group of tools, they have been subdivided into four groups based on shape and one residual group of unidentifiable fragments. The groups and their frequencies are as follows: 1) triangular (N=29; 18.0%), 2) lanceolate (N=18; 11.2%), 3) rectangular (N=1; 0.6%), 4) ovate (N=55; 34.2%), and 5) miscellaneous unidentifiable fragments (N=58; 36.0%).

Triangular Stage 3 Bifaces (Figure 80; Table 40): With the exception of the ovate bifaces, the 29 specimens classified as triangular bifaces exhibit the greatest amount of internal variability in terms of size, shape, and the amount of bifacial chipping employed in their manufacture. All of the specimens are isosceles triangles whose lateral and basal edges tend to be straight. Where the margins are not straight, they are only slightly excurvate. Cross-sections tend to be relatively thin, ranging primarily between biconvex and lenticular shapes. Of the three dimensions, only length exhibits a tendency towards a bimodal distribution. This attribute was used to define two subgroups. Thus, large triangular bifaces are those longer than 40.0 mm in length, and medium triangular bifaces are those less than 40.0 mm in length. The two sizes occur in nearly equal numbers.

Nearly all of the triangular bifaces show extensive bifacial flaking primarily consisting of linear and expanding flake scars. The large triangular bifaces also tend to be finished with continuous tertiary retouch along at least one of their margins. A small number, four medium and one large triangular biface, are simply bifacially retouched along the lateral edges and retain significant portions of the original flake surfaces. Slightly more than a third of these bifaces showed clear use damage. In most cases it consists of moderate amounts of rounding and attrition scarring of portions of one edge. In one case, the tip is heavily rounded and appears to have been used occasionally as a perforating tool.

Lanceolate Bifaces (Figure 81; Table 40): Six complete and 12 fragmentary bifaces have lanceolate shapes. Within this group, length and final retouch exhibit the greatest variability. The bifaces in this category are elongate with straight or slightly excurvate lateral edges. Bases tend to be straight, and in two cases they are canted at an angle. Four specimens have excurvate bases. The point of maximum width occurs at the base or, in several cases, slightly above the base. As with the triangular bifaces, cross-sections tend to be relatively thin and lenticular, biplano, or plano-convex in shape.

Figure 80. Stage 3 Triangular Bifaces
Rows 1-2: Large Variety
Row 3: Medium Variety

Figure 81. Stage 3 Lanceolate Blades

Figure

Figure

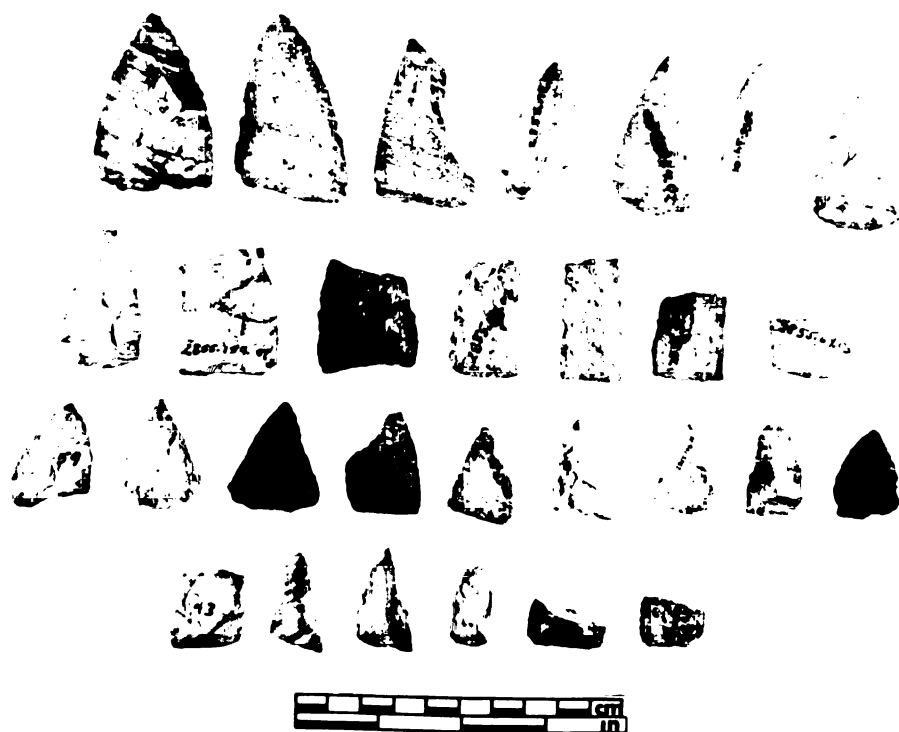


Figure 80.

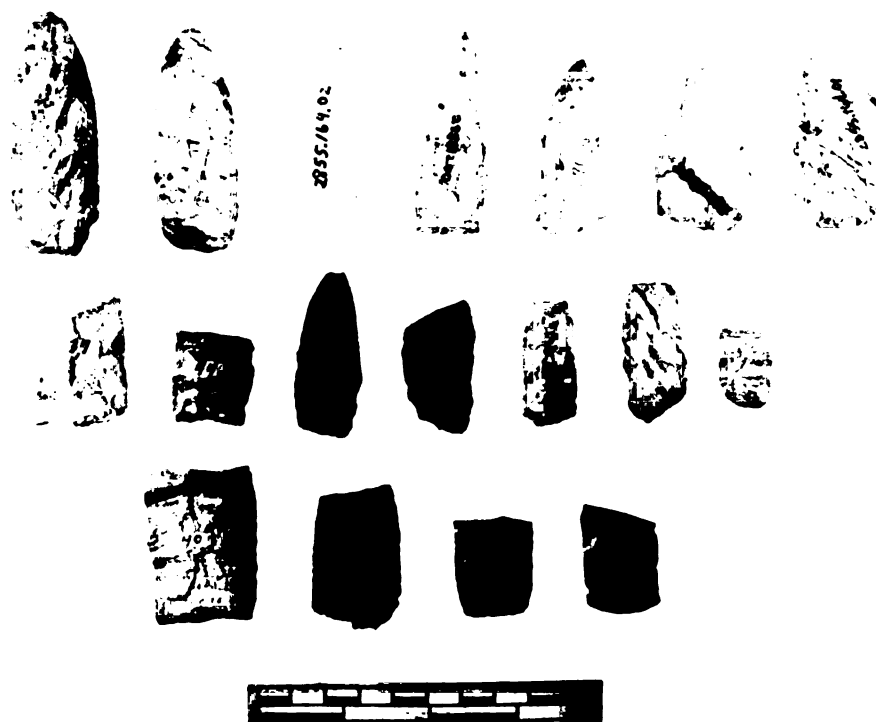


Figure 81.

Table 40. Stage 3 Bifaces

Acc. No.	Cross-Section	Length	Width	Thick.	Raw Material
Large Triangular:					
4.01	Lenticular	(34.4)	31.4	7.8	Norwood
28.20	Planoconvex	(22.8)	27.7	6.1	HT Norwood
29.02	Planoconvex	42.2	25.6	7.0	Norwood
33.02	Biconvex	(38.5)	21.6	9.5	Norwood
34.01	Planoconvex	44.0	25.6	6.3	Norwood
47.16	Lenticular	(51.1)	32.0	9.8	Norwood
69.03	Lenticular	(18.9)	30.9	11.0	Norwood
81.02	Biconvex	(37.5)	22.5	7.4	Norwood
83.01	Planoconvex	57.0	37.3	11.2	Norwood
153.01	Lenticular	53.8	36.8	9.2	Norwood
154.01	Lenticular	(39.8)	31.1	8.8	Norwood
178.01	Lenticular	43.4	30.5	8.0	HT Norwood
195.01	Biconvex	42.5	30.7	8.9	Norwood
Medium Triangular:					
1.04	Biconvex	29.2	18.2	6.0	Norwood
4.04	Biplano	33.8	28.6	5.1	HT Norwood
7.03	Lenticular	34.5	24.3	7.6	GL
19.02	Biplano	27.9	22.0	4.1	GL
22.02	Biconvex	(30.8)	(24.2)	8.0	Norwood
22.15	Lenticular	(31.6)	23.0	6.3	HT Norwood
28.06	Lenticular	34.0	28.1	4.7	Norwood
31.01	Biconvex	29.5	17.1	6.2	HT Norwood
71.01	Biplano	(31.4)	20.2	5.0	Norwood
84.02	Biconvex	(23.2)	(26.5)	8.1	GL
91.03	Biconvex	(13.8)	(24.4)	9.5	HT Norwood
146.01	Biconvex	18.5	27.2	7.5	GL
171.02	Lenticular	(16.0)	21.0	4.0	Norwood
181.01	Biconvex	(25.4)	(12.8)	7.5	GL
187.01	Biconvex	(23.7)	22.8	7.4	Norwood
Lanceolate:					
6.01	Planoconvex	72.8	27.7	6.7	Norwood
28.07	Biconvex	(30.0)	23.7	6.5	HT Norwood
28.11	Biplano	(49.3)	30.6	7.5	HT Norwood
32.03	Lenticular	(42.6)	26.4	6.4	Norwood
34.01	Biplano	53.4	24.6	6.0	HT Norwood
51.01/ 61.06	Lenticular	48.9	20.0	5.8	HT Norwood
61.05	Planoconvex	(39.4)	21.8	6.0	HT Norwood
68.02	Planoconvex	(39.4)	17.0	7.6	HT Norwood
71.01	Biconvex	(24.3)	17.5	5.0	HT Norwood
74.01	Biconvex	(41.4)	19.5	7.6	Norwood
81.01	Lenticular	(27.2)	24.0	7.4	HT Norwood
106.01	Bioconvex	(45.6)	32.4	8.8	Norwood

Table 40 (cont'd).

Acc. No.	Cross-Section	Length	Width	Thick.	Raw Material
163.01	Planoconvex	(38.2)	27.5	7.3	Norwood
163.01/164.01	Lenticular	(52.6)	29.3	8.3	Norwood
164.01	Lenticular	57.3	23.5	6.7	Norwood
164.03	Lenticular	(32.7)	23.1	6.2	Norwood
184.01	Lenticular	67.8	25.5	8.2	Norwood
200.00	Biconvex	61.9	21.8	7.3	Norwood
Rectangular:					
74.01	Biconvex	35.7	23.3	12.1	Norwood
Ovate:					
1.02	Biplano	(25.6)	(30.8)	6.1	HT Exotic
1.03	Biconvex	(10.3)	(20.6)	6.2	HT GL
1.04	Lenticular	(27.6)	(38.1)	8.2	Norwood
1.05	Planocon	(13.1)	(23.4)	7.1	GL
2.01	Biconvex	(38.6)	(45.7)	11.8	Norwood
2.11	Biplano	(24.1)	(37.2)	5.5	GL
3.02	Biconvex	(13.5)	(25.2)	6.9	HT Norwood
6.18a	Biconvex	(13.8)	(22.6)	9.1	HT Norwood
6.18b	Planoconvex	(34.0)	(24.1)	9.4	HT GL (gr)
7.01	Lenticular	(22.1)	(6.0)	3.4	HT Norwood
7.06	Biconvex	(27.2)	(29.8)	(10.9)	Norwood
7.08b	Lenticular	(33.7)	24.9	6.4	HT GL
7.08b	Lenticular	(28.0)	(19.3)	5.6	HT Norwood
13.01	Biplano	(16.8)	20.0	7.1	Norwood
19.02	Lenticular	(28.6)	(24.8)	4.4	HT Norwood
22.02	Biconvex	(24.1)	(6.6)	5.7	HT
22.03	Planoconvex	39.1	34.6	7.0	Cordell
25.50	Biconvex	(26.4)	22.4	7.6	Norwood
28.10	Biconvex	(11.8)	(25.5)	10.0	Norwood
28.15	Planoconvex	(25.4)	(22.2)	7.6	Norwood
28.25a	Planoconvex	46.1	22.6	9.0	Norwood
28.25b	Biconvex	(24.6)	26.3	10.0	GL
32.02	Biconvex	(29.8)	(25.6)	6.7	Norwood
38.01	Biconvex	(23.6)	28.8	8.1	GL
38.06	Lenticular	(34.7)	(18.6)	5.7	HT Norwood
42.01	Biconvex	(17.0)	(14.2)	7.8	GL
43.05	Biconvex	38.1	(21.0)	7.7	HT Norwood
44.01	Biconvex	(12.4)	(23.1)	7.0	HT Norwood
44.04	Biconvex	(33.8)	(9.0)	9.8	HT GL
50.02	Biconvex	38.7	23.1	7.0	Norwood
51.02	Planoconvex	(18.6)	21.8	6.9	Norwood
51.03	Planoconvex	46.0	35.2	12.4	Norwood
59.03	Lenticular	(32.0)	24.4	5.8	HT Norwood
65.01	Biplano	(53.7)	53.3	5.4	Norwood

Table 40 (cont'd).

Acc. No.	Cross-Section	Length	Width	Thick.	Raw Material
69.01	Biconvex	(15.0)	(22.2)	6.0	HT Norwood
80.06	Biconvex	33.5	(12.5)	10.0	GL
81.02	Lenticular	(53.2)	56.2	9.7	HT Norwood
84.01	Biconvex	34.8	18.7	7.5	Exotic
84.03	Lenticular	(16.0)	12.9	4.4	HT GL
106.01	Lenticular	(30.4)	(27.2)	5.8	Norwood
154.01a	Planoconvex	(18.1)	(26.4)	6.9	Norwood
154.01b	Biconvex	(18.8)	19.4	6.3	Norwood
155.01	Lenticular	57.0	37.9	8.0	Norwood
161.03	Planoconvex	32.0	20.7	6.5	HT Norwood
163.01a	Lenticular	60.7	39.8	10.1	Norwood
163.01b	Biconvex	40.5	(9.2)	3.5	Norwood
163.02	Biconvex	(30.8)	22.4	7.3	Norwood
163.08	Lenticular	(16.4)	(26.4)	6.0	Norwood
164.05	Planoconvex	(36.2)	(32.7)	(8.2)	Norwood
176.01	Biplano	(31.5)	23.4	5.6	HT Norwood
177.04	Planoconvex	(28.0)	20.5	7.1	HT Norwood
181.01	Lenticular	(32.6)	29.1	4.6	Norwood
183.01	Planoconvex	(30.8)	(27.3)	7.7	Norwood
183.02	Lenticular	(17.4)	(27.9)	6.0	HT Norwood
183.03	Lenticular	42.6	28.7	8.0	Norwood
000.00	Biconvex	(30.0)	(37.7)	(13.5)	GL
Hafted:					
65.01	Biconvex	38.7	16.2	9.3	GL
84.01	Biconvex	34.8	18.7	7.5	Exotic
84.02	Biconvex	(34.1)	30.3	11.7	HT Norwood

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Most of the lanceolate bifaces exhibit extensive bifacial flaking. Retouch on three of the bifaces, however, is restricted to one face or to the margins of the tool. Edge damage is relatively infrequent and is not very extensive when it does occur. Further, four of the specimens exhibit characteristics that are suggestive of an affiliation with the Plano/Early Archaic occupation of the adjacent Samels Field site. These bifaces exhibit shallow, lamellar flake scars which tend to meet along the mid-line of the tool. One specimen does not appear to have been completely finished as the lamellar retouch is restricted to one face. Fine tertiary retouch is present along the lateral margins of one specimen. Another specimen is patinated.

Rectangular Biface (Table 40): A single rectangular biface is present in the collection. It is manufactured from a short blocky secondary flake with cortex along one edge and the proximal end. The opposite lateral edge is slightly excurvate and bifacially retouched over half of both faces. The excurvate edge is also the only edge exhibiting use damage.

Ovate Bifaces (Figures 82 - 84; Table 40): With the exception of the unclassifiable fragments discussed below, the ovate bifaces are, by far, the most numerous biface form. This tool group also displays a wide range of internal variation in size and shape. Overall, these bifaces have excurvate to occasionally straight lateral edges, acute to broadly pointed distal ends, and predominantly excurvate bases. Bases are straight on ten specimens. The point of maximum width tends to be located at the proximal end of the tool. Biconvex, lenticular, and plano-convex shaped cross-sections predominate.

The ovate bifaces are mostly fragmentary, making any internal subdivisions very difficult and somewhat subjective. Of the 55 bifaces assigned to this group only ten are complete. Two groups can be differentiated on the basis of size: a large, relatively broad bladed variant, and a medium, relatively narrow bladed variant. As with the triangular bifaces, a length of 40.0 mm was used to separate the two size groups. This subdivision also has temporal implications.

Three complete and eight fragmentary bifaces are assigned to the large subgroup. Of these, five specimens are very distinctive (Table 40). They have thin, biplano cross-sections and well controlled flat, broad, linear and expanding secondary flaking. Short, lamellar, pressure flaking is present along the biface margin. Additionally, one specimen is patinated.

Typologically, these bifaces belong to a class of large bifacial ovate blanks associated with Plano and Early Archaic assemblages in the Upper Great Lakes (Fitting 1975; Mason 1982). Given the proximity of the Early Archaic Samels Field site on the adjacent terrace, the presence of these bifaces among the Late Woodland assemblage is not surprising. Since these specimens do not show any clear evidence of reuse, their presence is considered to be the result of the use of this part of the site by Early Archaic populations, rather than as a result of Late Woodland scavenging activities.

Figure 82. Stage 3 Ovate Bifaces

Figure 83. Stage 3 Ovate and Hafted Bifaces

Rows 1-3: Ovate Bifaces

Row 4: Hafted Bifaces

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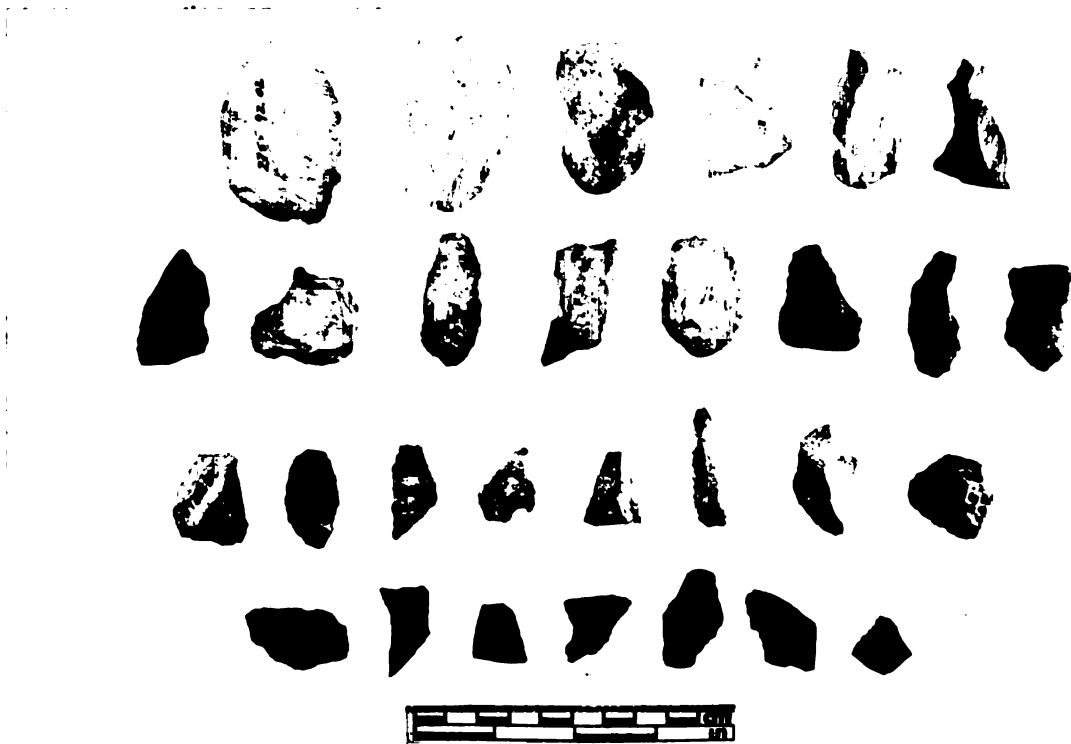


Figure 82.



Figure 83.

Figure 84. Pre-Late Woodland Stage 3 Ovate Bifaces

Figure 85. Drills

Figure

Figure



Figure 84.

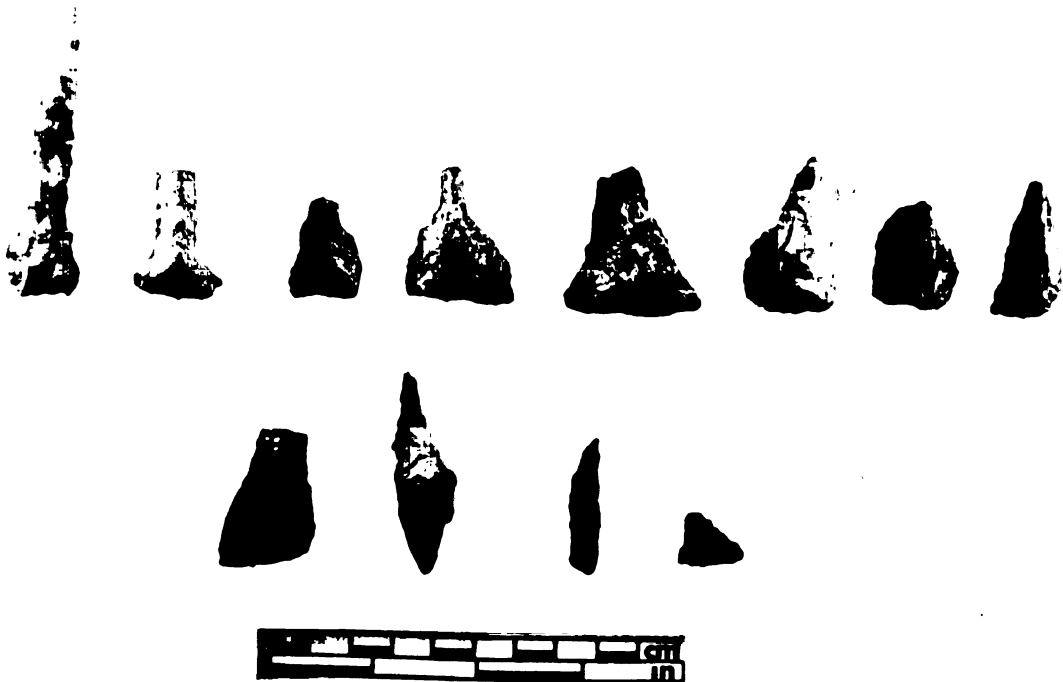


Figure 85.

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Though not assignable to the earliest occupational episode, two other ovate bifaces are heavily patinated and clearly pre-date the Late Woodland occupation. The non-Late Woodland bifaces are not considered further in this analysis.

The four large ovate bifaces which appear to be associated with the Late Woodland occupation are fairly dissimilar to one another. One specimen (163.01) is manufactured from a large flat decortication flake and retains portions of the original flake surfaces. It is asymmetrical and the lateral edges contract markedly below the midpoint of the tool. The base and one edge are bifacially retouched, while the other edge is retouched on the dorsal face only. The second specimen (155.01) is symmetrical with broadly excurved edges, a straight base and a lenticular cross-section. One edge exhibits unifacial, lamellar pressure flaked marginal retouch. Finally, the last two specimens are large tip fragments which broke along limey lamina in the chert.

The remaining 44 ovate bifaces have been assigned to the medium subgroup. This group is composed primarily of end and lateral fragments. Only five specimens are complete and one of them (22.03) is patinated (i.e., pre-Late Woodland). A wide range of chipping patterns are represented within this subgroup. The majority show extensive bifacial retouch consisting of linear and slightly expanding flake scars. Final retouch along the margins occurs infrequently. Where it does occur it tends to be located along the distal half of the edges and is intermittently placed. Several specimens exhibit only rough percussion flaking with no subsequent retouch prior to use. Additionally, virtually all of these artifacts exhibit some type of use damage, usually in the form of edge attrition or rounding of the edge. Several specimens exhibit edge rounding similar to that found on scrapers, while several others appear to have also functioned as perforators. Finally, several ovate bifaces were subjected to bipolar percussion. This appears to be a final attempt to modify or utilize these tools.

Hafted Bifaces (Figure 83; Table 40): The three bifaces placed in this category are distinguished by the fact that they exhibit clearly defined haft elements. Here the similarity between the specimens ends. The first specimen (65.01) has a straight sided stem and a very short triangular blade. The blade shape is the result of extensive resharpening. It has a biconvex cross-section and a "hump" at the haft-blade junction. The blade is damaged along one edge.

The second specimen (84.01) is a small biface with a broad, straight sided haft with an excurved base. The blade is triangular and has been resharpened. Retouch consists of carefully placed linear pressure flaking. Only minor edge damage is present on this biface.

The third (84.02) specimen is fragmentary, but appears to be from a relatively large biface. All of the haft edges are straight and one contracts slightly. The blade is weakly shouldered and appears to have been ovate in shape with a thick biconvex cross-section. Fragmentation occurs along a limey lamination in the chert.

Miscellaneous Biface Fragments (Table 41):

Fifty-eight finished bifaces are unclassifiable fragments. Slightly more than half (58.6%) of the fragments are lateral edge sections. Tip and base fragments occur in nearly equal frequency with 11 and 13 specimens, respectively. The vast majority of these fragments appear to be derived from either ovate or triangular bifaces.

Drills

Five complete and seven fragmentary drills were recovered at the Skegemog Point site (Figure 85; Table 42). Drills are characterized by narrow shafts and angular blade cross-sections. The flake scars at the distal end also tend to be rounded and heavily polished from use. They are presumed to have functioned primarily for the perforation of hard and/or dense substances such as wood, bone, antler, or ceramic.

Two forms, triangular and expanded base occur. The hafts of the expanded base drills are either asymmetrically square (N=3), or have outward flaring lateral edges (N=2). Cross-sections on the triangular drills are biconvex. The bits of the expanded base drills tend to have angular, diamond-shaped cross-sections, while their haft elements tend to have thinner biconvex cross-sections.

Two additional drills had unique shapes. One specimen is relatively wide and thick with a sharply contracting stem and a pointed base. Its haft element is about equally as long as the bit. The second specimen is a simple, narrow, straight shaft with a rounded base. Finally, a single small tip fragment is also present in the collection.

Norwood chert is the preferred raw material. Only three specimens are manufactured from glacially derived Cordell chert.

Pieces Esquillees

Ever since MacDonald (1968) defined pieces esquillees as a morpho-functional tool type in North American lithic assemblages, their recognition and interpretation has been the subject of considerable debate (Brose 1970:102-106; Flenniken 1980:81-90; Haynes 1977; MacDonald 1968:105; McPherron 1967:135-142; Robertson 1986:57; Sollenberger and Patterson 1976). The debate revolves around whether pieces esquillees are a formal tool type or merely the end product of the bipolar reduction of cores. In this report, they are considered to be a formal tool type which is distinguishable in most cases from opposed ridge bipolar cores.

Since pieces esquillees and bipolar cores are both end products of very similar mechanical processes, the morphological similarity between them must be acknowledged. It also appears that exhausted bipolar cores are occasionally recycled as pieces esquillees. Thus, these two classes of artifacts share a number of attributes often allowing separation only on largely subjective grounds. Using a conservative approach,

Table 41. Unidentified Biface Fragments

Acc. No.	Fragment	Length	Width	Thick.	Cross-Section	Raw Material
1.04	Tip	22.0	28.6	9.3	Biconvex	HT Norwood
8.03	Tip	8.0	16.6	6.4	Bicon	GL
8.07	Tip	26.5	22.4	6.8	Bicon	HT Nor
23.07	Tip	22.0	16.6	7.0	Planocon	HT GL
34.07	Tip	24.6	17.8	5.0	Planocon	Norwood
40.02	Tip	20.0	21.8	5.4	Bicon	HT Norwood
50.03	Tip	10.4	18.0	6.0	Bicon	Norwood
74.02	Tip	12.4	12.4	5.0	Planocon	Norwood
81.01	Tip	12.5	12.4	3.6	Lentic	GL
92.02	Tip	30.7	19.2	5.4	Bicon	HT Nor
177.01	Tip	32.1	26.4	6.7	Bicon	HT Norwood
1.02	Lateral	20.5	15.2	7.7	Bicon	HT GL
2.04	Lateral	13.3	8.7	7.1	Bicon	Burn GL
2.12	Lateral	13.3	16.3	6.5	Bicon	HT GL
6.02	Lateral	39.4	10.3	6.5	Bicon	Norwood
6.12	Lateral	23.5	14.4	8.0	Bicon	HT Norwood
7.02	Lateral	16.1	5.4	4.0	Lentic	GL
7.04	Lateral	19.5	12.4	6.5	Planocon	GL
7.06	Lateral	39.7	9.1	5.0	Bicon	HT Norwood
8.02	Lateral	15.1	24.8	6.2	Bicon	Burn Norwood
8.03	Lateral	54.5	18.5	7.5	Bicon	Norwood
23.09	Lateral	25.5	9.4	7.9	Bicon	HT Norwood
28.03	Lateral	24.8	6.4	3.8	Lentic	Norwood
29.02	Lateral	15.3	18.8	5.3	Lentic	GL
37.02	Lateral	17.0	11.1	8.2	Bicon	Norwood
38.06	Lateral	27.1	18.8	7.3	Biplano	Burned Norwood
40.01	Lateral	24.5	16.0	5.3	Lentic	Norwood
42.01	Lateral	33.4	20.7	6.6	Bicon	HT Norwood
42.02	Lateral	35.3	12.7	7.0	Planocon	HT GL
51.02	Lateral	20.7	10.2	5.1	Planocon	GL
60.02	Lateral	9.3	24.2	6.4	Bicon	Burn Nor
69.01	Lateral	21.5	24.0	5.2	Lentic	Norwood
82.02	Lateral	30.3	10.0	8.0	Bicon	HT Norwood
84.02	Lateral	19.3	10.7	7.5	Indeter	GL
84.03	Lateral	30.4	10.5	3.7	Lentic	HT Norwood
106.01	Lateral	23.8	7.0	3.4	Lentic	Norwood
154.01	Lateral	26.5	7.4	3.1	Lentic	Norwood
155.01	Lateral	11.6	15.4	6.1	Lentic	HT Norwood
161.01	Lateral	38.8	7.4	7.5	Bicon	HT Norwood
163.01	Lateral	20.3	12.0	6.0	Lentic	Norwood
163.02	Lateral	12.3	12.8	5.6	Indeter	GL
163.03	Lateral	30.0	20.6	7.5	Planocon	Norwood
164.02	Lateral	13.8	18.3	6.9	Bicon	HT Nor
176.03	Lateral	24.8	22.7	10.0	Bicon	HT Norwood
189.01	Lateral	15.4	22.8	8.8	Bicon	HT Norwood

Table 41 (cont'd).

Acc. No.	Fragment	Length	Width	Thick.	Cross-Section	Raw Material
7.11	Base	16.1	11.0	5.5	Bicon	HT Norwood
22.01	Base	15.0	23.5	6.6	Bicon	Norwood
23.04	Base	17.4	9.2	6.2	Bicon	HT GL
29.04	Base	12.7	25.6	9.2	Bicon	HT Norwood
47.05	Base	25.3	11.8	4.3	Lentic	HT Norwood
47.06	Base	17.2	8.1	4.0	Lentic	Burn GL
50.02	Base	23.6	13.3	6.8	Bicon	Norwood
52.01	Base	29.8	12.8	5.8	Lentic	Norwood
92.02	Base	20.8	10.0	6.5	Bicon	HT GL
103.02	Base	22.0	22.1	8.8	Bicon	GL
154.01	Base	15.0	15.8	5.5	Bicon	HT Norwood
155.01	Base	20.6	9.4	4.5	Lentic	Burn GL
176.01	Base	19.8	11.5	7.9	Bicon	HT GL

Table 42. Drills

Acc. No.	Shape	Total Length	Width	Thick.	Blade Length	Blade Width	Haft Length	Haft Width	Cross-Section	Raw Material
19.01	Expand	(33.6)	27.3	7.4	(16.5)	7.0	17.1	27.3	Diamond	HT Norwood
19.02	Triang	34.3	18.3	8.6	—	—	—	—	Biconvex	HT Norwood
28.03	Expand	(24.7)	19.0	10.3	(7.4)	—	17.3	19.0	Triang	Norwood
42.09	Bit Fr	(8.8)	(16.3)	(9.5)	—	—	—	—	Diamond	HT GL
58.03	Triang	40.4	23.7	7.0	19.2	16.2	21.2	23.7	Biconvex	Norwood
64.02	Triang	(27.2)	21.2	8.7	—	—	—	—	Biconvex	Norwood
81.02	Expand	70.4	17.7	5.8	54.7	10.6	15.7	17.7	Biconvex	Norwood
83.01	Triang	(37.3)	12.7	8.5	—	—	—	—	Biconvex	HT GL
155.02	Triang	(33.4)	23.7	6.1	—	—	—	—	Biconvex	HT Norwood
164.03	Bipoint	49.5	18.4	9.4	27.9	18.4	21.6	18.4	Diamond	Norwood
171.01	Str	33.5	8.6	6.0	—	—	—	—	Biconvex	Norwood
179.05	Expand	(31.5)	22.4	10.9	22.4	10.5	9.1	22.4	Diamond	GL

these specimens have been separated from bipolar cores on the basis of relative thickness, cross-section, proximal and distal end morphology, and the nature and asymmetry of the damage inflicted to the opposing ends of the tool.

A total of 128 specimens have been classified as *pieces esquillees* (Figure 86). In general, they are relatively small, rectangular tools averaging 22.3 mm in length, 22.9 mm wide, and 6.7 mm thick. The ranges of these three dimensions are 15.1 to 37.3 mm, 13.6 to 30.2 mm, and 3.6 to 14.0 mm, respectively. A small number of specimens are ovate in shape. Cross-sections are either lenticular, tabular, or biconvex. Virtually all of the specimens classified as *pieces esquillees* were manufactured from blocky secondary and flat secondary flakes of tabular Norwood chert. Blank type was not determined for only 13 specimens, most of which appear to have been fashioned from a split pebble or exhausted bipolar core. Half of the specimens are broken. Breakage results from lateral splitting induced by bipolar percussion.. This tool class exhibits a high rate of use-breakage in excess of 75%. This relatively high breakage rate along with the relatively large number of specimens recovered suggests that they had relatively short use-lives and were a readily expendable tool form.

Attribution of function is difficult. Tixier (1963:147) suggests they were used as a generalized tool for splitting hard, dense items such as wood, bone, or antler. On Middle Woodland specimens from the Summer Island site, Brose (1970:104-105) found striations which he interpreted as resulting from scraping bone and, possibly, splitting bone. Comparisons were also made with wear patterns described by Semenov (1964:106-107) on tools used to scale fish. At the Juntunen site, *pieces esquillees* are referred to as "gouged end artifacts" (McPherron 1967:141-142) associated a formal similarity between these artifacts and a wood gouge. Clearest evidence for the function of this tool class has come from the Saginaw Valley and the Inland Waterway of northern Michigan. At the Weber II site Robertson (1983:147) describes specimens exhibiting wood polish. A similar designation has been made in preliminary analyses of specimens from the Johnson site, a Late Woodland encampment in northern Michigan (Holman 1988:14, citing D. Sabo personal communication 1988). Current evidence suggests that they are primarily a wood working tool, although their use on bone or antler can not be ruled out at this time.

Scrapers

A relatively large sample of 123 scrapers are present in the Skegemog Point lithic assemblage. These tools are distinguished by their very distinctive patterns of steep, almost invariably unifacial retouch along one or more edges. Several studies have shown that unifacial tools with edge angles in excess of 45 degrees are highly associated with scraping functions (Semenov 1964:20; Wilmsen 1970:70-71). Additionally, this class of tools often exhibit varying degrees of distinctive macro-use wear consisting of edge rounding, polishing, and short, steep step fractures.

- Figure 86.** **Pieces Esquillees**
- Figure 87.** **Type 1 Endscrapers**



Figure 86.



Figure 87.

Location of the retouch has been used to subdivide the scrapers into four primary groups. Endscrapers are those specimens with retouch restricted to the distal end of the tool, while the retouch on the side scrapers may be located on one or both lateral edges. A small number exhibit retouch on both their distal end and lateral edge(s) forming a combination of the first two groups. A residual group consisting of small unidentifiable fragments has also been included.

Endscrapers

Endscrapers are the predominant variety of formal scraper present in the assemblage. A total of 68 specimens (55.3%) were identified. This group is also the only one to show any degree of systematic internal variation. The shape and cross-section of the specimens was used as a means to subdivide the endscrapers into five basic types or forms. In most cases, these aspects closely reflect the shape of the flake blank. The employment of bifacial flaking in the manufacture of the endscrapers is infrequent and largely restricted to one group. For this reason the importance of bifacial versus unifacial flaking is de-emphasized in this tool category. Endscrapers are typically associated with hide processing and working activities (Robertson 1987).

Type 1 Endscrapers (Figure 87; Table 43): Type 1 endscrapers are similar to specimens typically referred to as "keeled" endscrapers in the literature. This type was also employed the preliminary manuscript (Cleland n.d.a.), although the member specimens have been adjusted.

These endscrapers are relatively large with triangular shapes and plano-triangular cross-sections. The distal end is sharply convex and the straight, lateral edges contract to a nearly pointed base. Retouch, typically consisting of shallow linear flake scars, is generally restricted to the dorsal face of the tool. A number of specimens, however, have variable amounts of bifacial retouch or retouch on their ventral faces. On four specimens the entire ventral face is flaked to flatten the face. On three other endscrapers retouch is restricted to the proximal end of a single lateral edge on the ventral face. One of these specimens also exhibits very minor bifacial retouch along one half of the working edge. The shape of the proximal end and the occasional presence of retouch at this end suggest that this type of endscraper was originally hafted.

Large, thick, slightly expanding blocky flakes served as the tool blank in all cases. Remnants of the striking platform are present on the proximal end of all but three of the endscrapers in this Type. An uncharacteristically large proportion (50%) of the Type 1 endscrapers are manufactured from glacially derived cherts.

All of the type 1 endscrapers exhibit some degree of use. At least one shows clear evidence of resharpening, while another is somewhat odd in that it shows bipolar damage to the bit. This specimen may have been recycled as a wedge or chisel-like tool.

Table 43. Endscrapers

Acc. No.	Cross-Section	Length	Width	Thick.	S <	E <	Raw Material
Type 1:							
1.04	Planotr	(20.1)	21.2	10.0	70	85	Norwood
2.12	Planotr	53.3	28.7	16.0	75	80	Norwood
7.12	Planotr	28.0	(23.4)	11.6	55	75	HT Norwood
22.01	Planotr	57.2	26.7	11.8	60	85	HT Norwood
68.02	Planotr	29.8	25.2	8.6	70	100	GL
85.01	Planotr	39.0	18.8	10.0	25	60	GL
90.01	Planotr	51.8	21.0	12.1	60	80	GL
139.01	Planotr	47.6	20.9	11.0	55	90	Norwood
155.01	Planotr	44.2	23.7	8.3	60	85	HT Norwood
164.01	Triang	28.5	10.5	7.0	30	20	Norwood
172.01	Planotr	38.1	18.4	8.1	30	45	GL
183.02	Wedge	39.5	24.3	8.8	65	90	GL
Type 2, Variety 1:							
6.10	Planocon	(28.7)	18.1	5.5	50	70	Norwood
23.09	Planocon	(20.0)	(15.4)	5.7	85	85	HT GL
29.05	Planocon	30.8	25.2	8.0	55	80	HT Norwood
31.04	Planocon	34.4	19.9	8.4	80	90	Norwood
37.01	Wedge	36.0	27.0	10.0	40	75	GL
37.02	Lentic	29.3	19.0	3.2	65	80	HT Norwood
44.03	Planocon	42.8	28.9	7.2	80	80	Norwood
47.01a	Planocon	27.5	20.3	7.7	80	80	Norwood
47.01b	Tabular	29.8	8.2	6.7	55	90	Norwood
74.01	Tabular	19.7	(18.6)	9.0	85	85	HT GL
104.02	Planocon	31.2	28.2	6.5	65	80	HT Norwood
154.02	Planocon	25.6	24.0	9.7	70	70	Norwood
162.01	Planocon	25.3	17.4	8.4	65	80	HT Norwood
174.01	Planocon	33.1	20.3	7.3	40	60	Norwood
177.01	Planocon	19.8	14.5	4.0	65	75	HT Norwood
180.01	Tabular	26.1	17.5	5.1	75	90	HT Norwood
Type 2, Variety 2:							
37.02	Planocon	(30.5)	23.0	8.0	60	80	GL
40.01	Planocon	32.2	21.2	5.5	55	80	HT Norwood
44.03	Planocon	35.3	17.8	7.2	75	85	Norwood
46.03	Planocon	24.7	20.0	9.3	70	80	Norwood
47.07	Planocon	25.3	18.7	5.2	65	80	Norwood
50.03	Planocon	30.2	25.2	8.0	75	90	HT GL
70.02	Planocon	46.6	28.6	15.4	70	80	Norwood
74.01	Planocon	(21.2)	27.0	8.3	70	90	HT Norwood
164.03	Planocon	31.3	19.1	7.4	70	75	HT Norwood
176.01	Planocon	27.8	19.2	6.3	60	85	HT GL
181.02	Planocon	38.2	27.9	8.5	60	70	Norwood

Table 43 (cont'd).

Acc. No.	Cross- Section	Length	Width	Thick.	S <	E <	Raw Material
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Type 3:

2.01	Planocon	30.1	21.6	7.8	80	85	HT Norwood
2.06	Planocon	(12.3)	16.2	6.2	45	80	Norwood
4.04	Planocon	26.5	19.9	9.4	65	85	HT GL
6.17	Planocon	(23.1)	24.7	8.2	80	80	GL
6.18	Planocon	16.2	16.3	7.7	60	80	HT GL
10.02	Planocon	(23.6)	19.3	6.7	65	90	HT Norwood
19.02a	Planocon	29.0	15.8	4.2	50	95	Norwood
19.02b	Planocon	31.0	21.1	5.5	80	100	Norwood
19.03	Planocon	23.0	18.0	6.3	65	80	Norwood
47.01a	Planocon	(25.4)	25.0	6.0	65	85	Norwood
47.01b	Planocon	(21.9)	14.7	5.6	85	85	HT Norwood
59.01	Planocon	25.8	18.9	6.8	85	85	HT GL
70.02	Planocon	31.0	18.7	5.5	55	85	HT Norwood
81.02	Tabular	28.3	(24.8)	9.0	45	85	Norwood
82.05	Planocon	(21.0)	(24.6)	5.2	40	70	HT Norwood
145.01	Tabular	28.0	21.3	8.3	80	85	GL
171.02	Planocon	23.9	17.1	5.4	60	80	GL
174.01	Planocon	30.6	19.9	8.2	60	60	Norwood
176.02	Planotr	42.9	27.0	8.1	60	70	Norwood

Type 4:

19.03	Planocon	21.2	18.4	4.0	70	85	GL
22.04	Planocon	23.0	18.8	4.0	60	80	HT GL
50.01	Planocon	23.0	17.9	5.5	80	90	Norwood
50.02	Tabular	23.2	24.0	7.0	70	85	HT Norwood
81.01	Wedge	33.5	26.6	11.0	75	85	Norwood
81.02	Planocon	23.0	21.7	8.2	65	80	Norwood
163.01	Planocon	23.6	20.6	4.9	60	80	GL

Type 5:

81.02	Planocon	43.0	35.5	6.2	75	75	Norwood
172.02	Planocon	27.9	23.0	6.9	75	75	Norwood

Type 2 Endscrapers (Figure 88; Table 43): This is the predominant type of endscraper present in the collection. Like Type 1 endscrapers, these endscrapers are triangular to somewhat ovoid in shape. Their cross-sections, however, are relatively thin and predominantly plano-convex in shape. The exceptions tend towards thin, tabular cross-sections. Lateral edges are generally straight and contract to a pointed or nearly pointed base. The presence of striking platform remnants on the proximal end of most of the specimens affects their specific shapes. Type 2 endscrapers are manufactured on elongate, expanding tabular and blocky flakes of varying sizes. They do show variation in the location and extent of the intentional retouch and were divided into two varieties based on these differences.

Variety 1 endscrapers are unifacial. Retouch is concentrated on the distal end and the lateral edges of these tools. Four examples exhibit no marginal retouch along their lateral edges. Interestingly, one specimen is manufactured on a hinged-out decortication flake with the retouch placed on the ventral face in order to take advantage of the natural contours of the flake. Four specimens show evidence of resharpening.

In contrast, Variety 2 endscrapers are extensively bifacially flaked. The primary flake surfaces are almost completely obscured. Five of the 12 bifacial endscrapers have been resharpened.

Type 3 Endscrapers (Figure 89; Table 43): Type 3 endscrapers are differentiated by their rectangular shape. With the exception of the distal end of the tool, all edges are straight. Although both flat and blocky flakes served as the tool blank for this endscraper type, plano-convex cross-sections predominate. Retouch is unifacial and largely restricted to the lateral margins and distal end of the tool. The proximal end is generally not retouched and often retains portions of the striking platform. Nineteen specimens have been assigned to this type.

Type 4 Endscrapers (Figure 89; Table 43): Type 4 endscrapers are small ovoid to circular tools with plano-convex cross-sections. All edges are broadly excurvate. Retouch is unifacial and usually restricted to the distal end. In two cases the lateral edges are retouched. All but one of the specimens are made on small flat flakes. The exception is manufactured from a blocky decortication flake. In two cases, the complex striking platforms are still present on the flakes indicating that they were struck off a bifacial rather than a block core.

Type 5 Endscrapers (Figure 89; Table 43): The two scrapers placed in this type are unique in the collection. They are manufactured from large, expanding flat flakes with a bulbous projection on one distal corner. In both cases, this projection was unifacially retouched. No other retouch is present.

Figure 88. Type 2 Endscrapers

Figure 89. Type 3, Type 4 and Type 5 Endscrapers

Row 1: Type 3

Row 2: Type 4

Row 3: Type 5

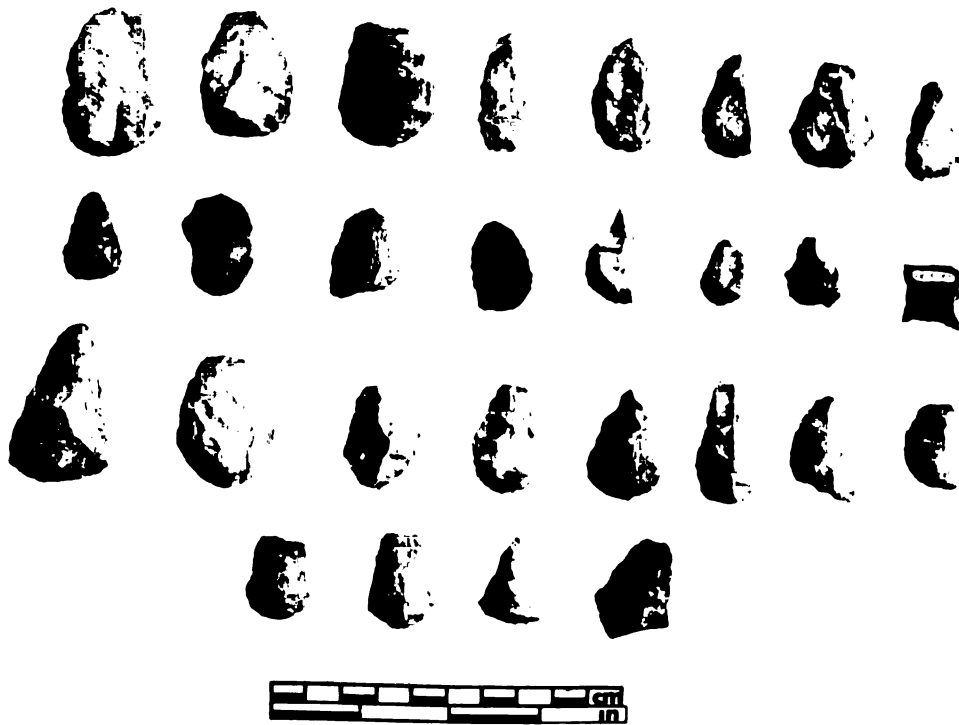


Figure 88.



Figure 89.

Side Scrapers

Twenty-nine side scrapers have been identified in the assemblage (Figure 90; Table 44). As noted above, this scraper form is distinguished by the presence of steep unifacial retouch along one (62%) or both (38%) lateral edges. The side scrapers are manufactured from linear flakes, the majority of which have straight sides and rectangular shapes. Only three specimens have ovoid shapes. Two specimens are made from expanding flakes. Five specimens are too fragmentary to determine shape. Flat flakes comprise nearly two-thirds of the flake blanks. Nine side scrapers are manufactured from blocky flakes. Cross-sections tend to be fairly thin and plano-convex or lenticular in shape.

Retouch is restricted to the flake margins in all instances except one. The exception, specimen 7.06, exhibits shallow, linear flake scars on the dorsal face meeting along the mid-line of the tool. Most of these tools exhibit some degree of rounding and step fracturing of the retouched edge. In addition, one specimen has a small notch measuring 6.2 mm wide and 3.2 mm deep on one distal corner, and another specimen was recycled as a wedge.

Side scrapers are viewed as a generalized scraping and cutting tool utilized on a wide number of substances (Semenov 1964). As such, they may be linked to activities involving the manufacture and maintenance of other tools and articles of material culture.

Combination End and Side Scrapers

Ten specimens have steep unifacial retouch along both the distal end and one or both lateral edges. These scrapers tend to be ovoid to rectangular in shape and have plano-convex cross-sections (Figure 90; Table 45). As with the other varieties of scrapers, flat and relatively thin blocky flakes served as the tool blank. Retouch is restricted to the flake margins and the dorsal face. One small specimen has a small notch chipped into the distal end of both edges.

Unidentified Scraper Fragments

Sixteen specimens were too small and fragmentary to be accurately classified. The intact edge of a majority (N=11) of the specimens are excurvate. These were probably derived from endscrapers. Half of the specimens are fractured from burning.

Other Unifaces

End and side scrapers, described above, comprise the majority of the unifacial tools in the Skegemog Point lithic assemblage. In addition to these, a small number of other formal unifacial tools are represented. Included here are denticulates, perforators, graters, and notches. All of these tools consist of flakes with short, marginal retouch

- Figure 90. Sidescrapers and Combination End and Sidescrapers**
Rows 1-2: Sidescrapers
Row 3: Combination End and Sidescrapers
- Figure 91. Denticulates and Notches**
Rows 1-2: Denticulates
Row 3: Notches



Figure 90.

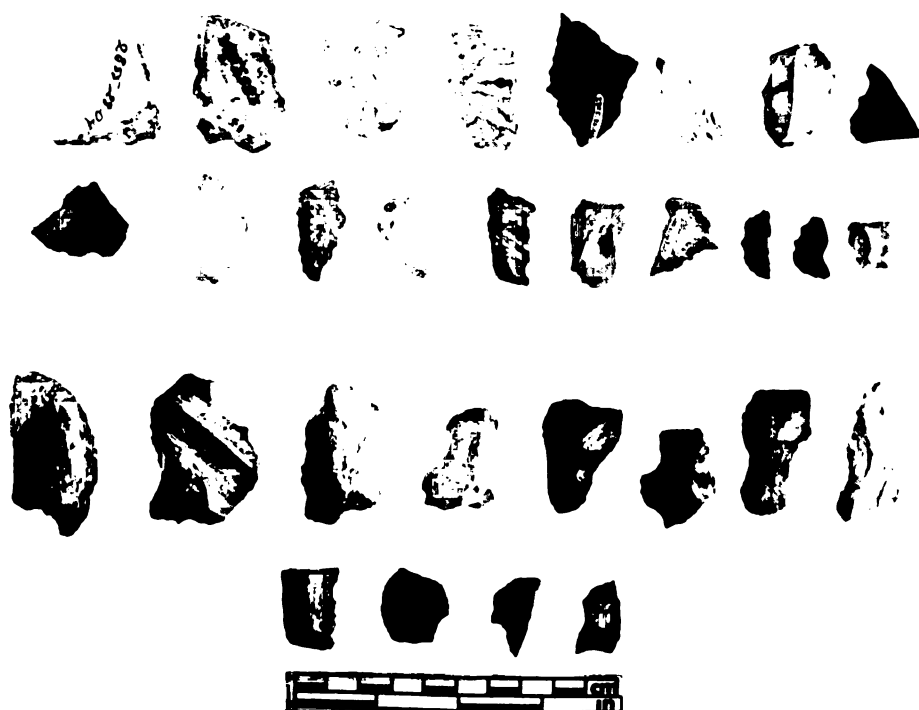


Figure 91.

Table 44. Sidescrapers

Acc. No.	Shape	Cross-Section	Length	Width	Thick	E <	Raw Material
1.01	Rect	Lentic	29.2	23.4	5.8	80	GL
1.04	Indeter	Tabular	(15.5)	(15.5)	6.3	65	GL
6.05	Indeter	Planocon	(27.1)	(18.6)	(7.8)	75	HT Norwood
7.02	Indeter	Biconvex	(29.7)	(22.2)	10.8	50	HT GL
7.06	Rect	Planocon	29.4	20.4	10.6	80	GL
23.07	Triang	Planocon	26.0	13.6	3.3	60	Norwood
29.02	Rect	Planocon	(41.5)	25.6	7.0	70	HT Norwood
38.07	Rect	Lentic	30.1	15.2	3.0	70	Norwood
44.01	Ovoid	Planotr	47.8	33.0	9.0	75	Norwood
50.03a	Linear	Lentic	40.0	16.8	1.7	70	HT GL
50.03b	Linear	Planocon	(18.6)	17.8	4.4	75	GL
50.03c	Linear	Planotr	(44.2)	20.5	6.8	70	Norwood
61.02	Linear	Planotr	38.5	12.0	4.1	60	Norwood
69.01	Ovoid	Planocon	36.0	32.0	8.2	80	Norwood
70.02	Linear	Planocon	(23.5)	(20.2)	4.9	70	HT GL
72.01	Rect	Tabular	34.5	(21.4)	8.6	80	HT GL
83.02	Indeter	Planocon	(38.0)	20.3	14.5	80	HT Norwood
84.02	Rect	Lentic	25.2	28.0	6.5	75	HT Norwood
84.04a	Linear	Planocon	43.0	19.3	4.8	60	Norwood
84.04b	Linear	Planocon	35.0	26.8	6.2	70	HT Norwood
92.02	Rect	Tabular	58.5	39.0	7.9	75	HT Norwood
139.03	Indeter	Planocon	(20.0)	(32.3)	5.3	80	Norwood
163.01a	Ovoid	Lentic	39.8	27.4	5.0	60	Norwood
163.01b	Linear	Lentic	31.1	17.3	3.2	50	HT GL
163.01c	Linear	Planocon	(28.4)	16.2	3.0	75	Norwood
172.02	Linear	Lentic	47.0	25.3	4.4	75	HT Norwood
174.02	Rect	Planotr	55.4	38.0	13.0	45	HT Norwood
176.02a	Rect	Lentic	39.4	28.7	5.0	70	Norwood
176.02b	Linear	Planocon	36.2	22.2	5.6	90	HT GL

Table 45. Combination End and Side Scrapers

Acc. No.	Shape	Cross- Section	Length	Width	Thick	E <	S <	Raw Material
2.04	Ovate	Planocon	22.5	24.5	6.0	70	70	GL
7.06	Rect	Planocon	29.3	21.4	10.4	80	80	GL
8.06	Indeter	Tabular	(29.4)	(9.5)	6.6	75	75	HT GL
22.02	Rect	Planocon	39.3	32.0	5.0	70	70	HT Norwood
31.07	Ovoid	Planocon	(23.9)	22.8	6.6	80	75	HT Norwood
47.05	Rect	Planocon	40.0	32.6	6.4	80	65	HT Norwood
50.02	Square	Planocon	28.1	28.2	5.8	70	70	Norwood
104.02	Ovoid	Planocon	34.3	24.0	6.2	65	45	HT GL
106.02	Ovoid	Lentic	(20.2)	24.5	3.1	40	50	HT Norwood
176.02	Rect	Planocon	36.1	27.8	6.2	90	75	HT Norwood

employed to shape the working edge. They are also generally associated with relatively specific types of usage. Denticulates typically are assigned a saw-like function (Semenov 1964). Perforators seem to have been used to pierce thin, soft items such as hide. Gravers are used for the graving, incising or slotting of a wide spectrum of goods including wood, bone, and antler. Notches are often assigned a shaving function analogous to that of a spokeshave. All of these tools are primarily employed in the manufacture and maintenance of other tools and goods.

Denticulates (Figure 91; Table 46): Denticulates are distinguished by the presence of a series of continuous concavities along the edge produced by short, steep, unifacial retouch. A total of 18 specimens have been identified. They are all manufactured on linear and slightly expanding flakes, ten of which are flat flakes and eight of which are blocky flakes. Only three of the specimens exhibited complex striking platforms suggesting that flakes from bifacial reduction were rarely selected. The whole denticulates range between 23.7 and 38.4 mm, and average 29.8 mm in length. Retouch is restricted to one lateral edge on all except 4 of the specimens; the latter are retouched along both lateral edges. Further, one specimen (163.01) exhibits a projection in the center of the denticulated edge that may have been used as a perforator. Finally, one denticulate (1.04) is patinated and can clearly be associated with the pre-Late Woodland occupation of the site.

Notches (Figure 91; Table 47): Unifacial tools classified as notches exhibit a single concavity along one edge formed by short, steep marginal retouch. Only three specimens are manufactured from flat flakes. The remainder are manufactured from blocky flakes, three of which are decortication flakes. One of the flat flakes has a complex striking platform. The notches are relatively broad and shallow averaging 13.4 mm wide and ranging between 8.4 mm and 19.6 mm. Notch depths average 2.9 mm and range between 1.5 mm and 5.2 mm.

Perforators (Figure 92; Table 48): A total of 14 perforators are represented in the collection. Perforators are defined by the presence of a small, short retouched projection. The projections are occasionally bifacially retouched and are typically rounded and polished from use. The use-wear found on these specimens is analogous to that found on drills. Half of the specimens are manufactured from either linear or expanding flat flakes. The remaining half are manufactured from blocky flakes, four of which are decortication flakes. Only one specimen is complete and it has a simple striking platform. Flake sizes range between 34.7 mm and 57.4 mm, and average 41.5 mm in length.

Gravers (Figure 92; Table 49): A retouched graving spur is present on seven flakes. Morphologically, graving spurs are somewhat akin to the perforators. They are exclusively unifacially chipped, slightly narrower and shorter than the perforators, and the projection is faceted rather than rounded from use. Tool blank source types are evenly split between blocky flakes and flat flakes with simple striking platforms. Four

Figure 92. Perforators and Gravers

Rows 1-2: Perforators

Row 3: Gravers

Figure 93. Celts and Axes

Rows 1-2: (Specimens 1-3) Celts

Row 2: (Specimen 4) Axe



Figure 92.

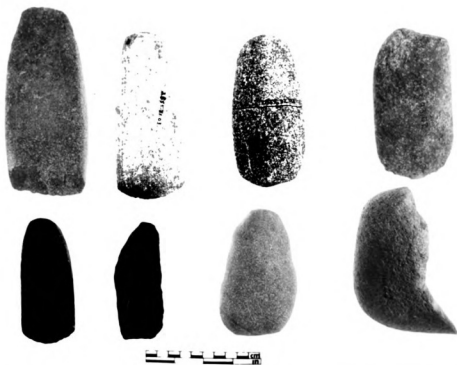


Figure 93.

Table 46. Denticulates

Acc. No.	Length	Width	Thick	Shape	Cross- Section	Flake Type	Raw Material
1.01	(18.7)	(28.4)	10.4	Ovate	Wedge	BS	HT Norwood
1.04	27.3	43.2	10.1	Rect	Tabular	BS	GL
2.06	(18.1)	(12.6)	3.0	Rect	Lentic	FSS	GL
28.04	40.4	35.1	9.3	Triang	Wedge	BD	HT Norwood
28.11	33.8	29.8	9.4	Ovoid	Planotr	BD	HT Norwood
31.05	38.7	23.1	5.8	Rect	Flat	FSS	HT Norwood
51.01	38.4	31.2	8.4	Ovate	Planotr	BS	Norwood
52.01	23.7	29.7	7.3	Trap	Triang	BS	HT Norwood
62.08	22.0	(10.0)	4.2	Ovate	Flat	FCS	GL
69.01	30.0	15.9	2.8	Triang	Flat	FCS	HT Norwood
70.02	20.5	27.1	5.0	Rect	Flat	FSS	HT Norwood
82.02	(34.3)	28.6	9.0	Trap	Tabular	BSF	Norwood
83.01	30.0	25.4	10.5	Rect	Triang	BS	HT Norwood
163.01	27.0	(19.0)	4.1	Ovate	Flat	FSS	HT Norwood
164.01	21.5	25.1	2.7	Trap	Flat	FCS	Norwood
176.02a	29.3	15.8	3.3	Rect	Lentic	FSS	HT Norwood
176.02b	34.0	19.8	2.1	Rect	Flat	FSS	Norwood
000.00	(15.4)	15.1	3.2	Rect	Flat	FSF	HT Norwood

Table 47. Notches

Acc. No.	Flake Type	Length	Width	Raw Material
1.10	BS/SD	25.0	17.5	HT Norwood
4.04	BSF	(22.6)	(13.3)	HT Norwood
59.05	FCS	31.7	23.5	Norwood
65.02	BD	51.2	28.0	Norwood
68.02	FSS	21.4	21.3	Norwood
75.01	BSF	(12.4)	(24.5)	HT Norwood
82.02a	BS	39.5	21.1	HT Norwood
82.02b	BS/SD	33.8	48.6	Norwood
92.02	BS	45.0	25.5	Norwood
106.02	BS	30.5	28.0	HT Norwood
156.01	BS	23.7	37.6	HT Norwood
163.02	FSS	44.6	20.9	Norwood
176.01	BD	39.3	25.0	GL
181.03	BD	42.0	40.3	Norwood

Table 48. Perforators

Acc. No.	Flake Type	Length	Width	Perforator Dimensions	Raw Material
1.02	BS	41.2	30.1	8.8 X 11.6 X 8.6	HT Norwood
1.04	BS	(20.5)	(18.6)	11.2 X 12.0 X 5.9	HT Norwood
4.04	FSF	(12.5)	(13.9)	4.5 X 4.6 X 2.9	HT Norwood
31.02	FSS	42.4	23.4	5.0 X 8.3 X 2.6	HT Norwood
44.01	BDF	38.2	21.4	10.0 X 10.7 X 8.5	HT Norwood
50.02	FSF	(25.5)	13.2	4.0 X 5.0 X 2.1	GL
50.03	BD	34.7	41.5	3.6 X 5.8 X 2.5	HT Norwood
58.03	BS	35.0	35.5	10.1 X 12.6 X 6.1	HT Norwood
69.01	BDF	(44.5)	(25.6)	8.0 X 9.3 X 6.1	HT Norwood
72.01	FSF	(18.8)	7.7	9.2 X 5.0 X 2.0	GL
84.03	FSF	(17.7)	10.2	6.7 X 4.9 X 2.9	HT Norwood
104.02	FSF	(18.3)	9.2	13.3 X 7.1 X 3.3	GL
106.01	BD	57.4	32.5	13.8 X 9.3 X 4.0	HT Norwood
195.01	FSF	(17.3)	23.0	2.0 X 2.5 X 2.5	HT Norwood

Table 49. Gravers

Acc. No.	Flake Type	Flake Shape	Cross-Section	Length	Width	Thick	Raw Material
32.02	FSD	Expand	Triang	30.5	24.0	8.0	HT Norwood
42.02	BDF	Linear	Tabular	27.8	20.1	6.8	HT Norwood
68.03	BS	Linear	Planotr	23.3	16.5	6.6	HT Norwood
74.01	BD	Linear	Wedge	38.0	22.3	10.5	HT Norwood
83.02a	Shat	Linear	Diamond	32.1	23.4	13.7	HT Norwood
83.02b	FSD	Trap	Planocon	23.2	20.4	6.8	HT Norwood
147.02	FSS	Ovoid	Lentic	17.8	18.2	2.6	GL (ex tan)

of these flakes are decortication flakes. Additionally, one piece of shatter was also utilized. The graters range between 17.8 mm and 32.1 mm, and average 23.8 mm in length.

Formally Retouched and Edge Damaged Flakes

Formally retouched and edge damaged flakes are distinguished as two varieties of expedient tools. They are characterized by varying amounts of intentional retouch and/or edge damage along the flake margin(s). The nature of the retouch and/or edge damage provides the discriminating attributes to separate the two tool types. Flake scars on retouched pieces tend to be fairly consistent and regular in size, shape, and orientation, and are continuous along the entire edge or a portion of it (Robertson 1986:53). Quite frequently, the scars will reach up to 5 or 7 mm in length. The scarring on edge damaged or utilized flakes is much smaller, usually no more than 1 to 2 mm, more irregular in shape, size, and orientation, and it tends to be intermittent along an edge (Robertson 1986:53). Further, a number of studies (Keeley 1980; Vaughn 1981) have shown that edge damage can also result from a variety of natural processes. To allow for this factor, a conservative approach was employed during the sorting of these flakes.

Out of a total of 1,374 flakes with edge-damage, 538 were classified as tools. The remaining flakes exhibit isolated areas of edge-damage not usually associated with use. A total of 286 flakes exhibit intentional retouch. These were subdivided into two groups based on the whether the marginal retouch was unifacial or bifacial. Those retouched pieces with bifacial retouch are referred to as flake knives, while those with unifacial retouch are simply termed retouched.

The 42 flake knives identified in the assemblage are manufactured primarily from linear to slightly expanding flat flakes struck from cores. Twenty-two retain simple striking platforms, while one has a complex striking platform. An additional 11 specimens are distal, flat flake fragments. Other flake types represented include a single blocky decortication flake, five blocky flakes and a single split glacial cobble. All specimens exhibit shallow to moderately steep (< 45 degrees) bifacial retouch along one (N=22) or both (N=17) lateral edges. In those cases where two edges are retouched, one edge is slightly steeper than the other and appears to serve as backing for the blade. Seventy six percent of the flake knives are manufactured from Norwood chert. These tools are presumed to have functioned as generalized knives.

Two hundred forty-four flakes were classified as retouched. As noted above, retouch is primarily unifacial. Flat flakes with simple striking platforms (N=76) and blocky secondary flakes (N=88) were clearly preferred as blanks for these expedient tools. An additional 38 specimens consist of distal fragments of flat flakes, while 17 specimens are flat flakes with complex striking platforms. Decortication flakes were retouched in only 22 instances. Shatter is even more poorly represented with only three examples. In addition to preferring certain flake types, a range of sizes also appear to

have been selected for. Flake size was measured in 10 mm intervals. Sizes 3 (N=44), 4 (N=57), and 5 (N=29) were the sizes most frequently selected for. The frequencies of flake size drop off markedly to 9 and 7 specimens in size groups 2 and 1, respectively. Furthermore, approximately half of the flakes exhibited evidence of detachment in a bipolar fashion. As usual, raw material is overwhelmingly Norwood chert (78.6%).

Inferences concerning the specific function of these tools is difficult, if not impossible, without the employment of microwear analysis (e.g., Keeley 1980). As summarized by Robertson (1983:53) several studies have suggested that a broad functional distinction can be made using the edge angle of the tool. Where the edge angle exceeds 45 degrees the tools tend to be associated with a variety of generalized scraping, shaving, planing, and heavy cutting of items such as hide, sinew, plant fibers, wood, and bone. Tools with edge angles of less than 45 degrees are associated with generalized, light cutting activities, and may be characterized as unifacial knives. This latter group comprised the majority of the retouched flakes, accounting for 77.1% of the total. A small number of the retouched flakes with relatively steep edge angles appear to have also functioned in a wedge-like (N=7), or graving (N=4) fashion based upon vague similarities to wear damage on pieces esquillees and unifacial gravers, respectively. Overall, the edges tend to be either straight or slightly excurvate and retouch is primarily restricted to a single edge. Forty five flakes are retouched along both edges, 21 are retouched on the distal end of the flake, and retouch location was not identifiable on an additional 15 fragments.

Edge damaged are slightly more abundant than intentionally retouched flakes with 252 specimens identified in the assemblage. Morphologically the flakes employed for this group of tools is very similar to those used as retouched pieces. Blocky secondary flakes (N=64) and flat flakes with simple striking platforms (N=74) comprise the bulk of this tool group. Flat flakes with complex striking platforms were slightly more abundant at 29 identified specimens. Only 26 utilized flakes occurred on decortication flakes, and the remainder are unidentified flat flake fragments. A slightly smaller range of flake sizes are represented with 88% of the measurable flakes falling between Size 2 and Size 4. Edge angles on utilized flakes are consistently shallow and they are presumed to have served a wide number of general cutting functions. Raw material is overwhelmingly Norwood chert (85.7%).

Unidentified Specimens

Four lithic specimens defied classification within any of the above categories. These four pieces are small fragments which exhibit extensive evidence of battering and attempted flaking. They are small and amorphously shaped. It is even unclear as to whether the flaking and battering present is a result of attempting to use the pieces as cores or as tools.

COARSE STONE TOOLS

A total of 109 whole and fragmentary coarse stone tools were recovered at the Skegemog Point site. This group includes a wide variety of tool types manufactured from a diversity of igneous, metamorphic, and sedimentary rocks. Included here are: 1) celts (N=8), 2) axes (N=1), 3) ground stone ornaments (N=4), 4) unidentified ground stone fragments (N=6), 5) hammerstones (N=13), 6) anvilstones (N=11), 7) manos or handstones (N=35), 8) grinding slabs or surfaces (N=18), 9) abrading stones (N=2), 10) maul (N=1), 11) preforms (N=1), 12) miscellaneous/unidentified coarse stone tools and/or working surfaces (N=9). A number of these specimens show evidence of multiple uses. In these cases, the tools have been classified according to their primary function.

Celts (Figure 93; Table 50)

Eight celts are present in the non-chipped lithic assemblage from the site. The celts average 168 mm by 59.8 mm and are ovoid to rectanguloid in shape. Cross-sections are primarily tabular. In two cases the cross-section is biconvex. One celt is represented by a poll fragment. The lateral edges are pecked and polished leaving the distal two-thirds of both faces unsmoothed. The bits are well smoothed and excurvate with edge angles measuring between 55 and 70 degrees. The bits of four of the specimens are damaged from use. One specimen (65.04) was recycled as a hammer after the bit was broken off. Celts are generally presumed to have functioned in a number of heavy woodworking and other chopping tasks.

Two of the specimens assigned to this category are unfinished celts. In both cases they appear to be in the final stages of manufacture. One specimen (32.01/32.02) is complete except for the final beveling of the bit. Only approximately one-third of the surface still exhibits peck marks from the final shaping process. The second specimen (147.01) is in the initial stages of smoothing. The dorsal surface exhibits coarse flake scars, while the ventral surface is unmodified. The bit has been shaped in this case.

All of the celts are manufactured from igneous rocks, most of which are either granite or diorite. Although the actual source area for this raw material is not known, it is presumed to have been obtained from deposits of glacial gravels.

Axe (Figure 93; Table 50)

The single specimen classified as an axe is relatively short and broad. It has a plano-convex cross-section. The specimen is smooth over its entire surface and it has been split laterally from use. The bit is excurvate and has an edge angle of 70 degrees. The axe measures 122.4 mm in length, 53.4 mm thick, and has a fragmentary width of 88.6 mm. A large greenstone cobble served as the tool blank. The size of this specimen suggests that it was used for heavy cutting tasks, such as felling trees.

Table 50. Celts and Axe

Acc. No.	Shape	Cross-Section	Length	Width	Thick	Raw Material
Celts:						
6.04	Ovate	Tabular	109.4	47.1	25.1	Granite
31.03	Trap	Tabular	150.0	61.0	31.3	Granite
32.01	Rect	Planocon	133.2	63.2	30.2	Ign.
58.03	Ovate	Biconvex	(65.4)	54.1	30.7	Granite
93.02	Rect	Tabular	130.1	66.3	34.2	Granite
99.01	Rect	Tabular	164.0	70.3	32.9	Granite
147.01	Rect	Wedge	102.1	36.9	22.4	Diorite
192.01	Ovate	Ovate	(47.0)	(35.7)	(29.3)	Granite
 Axe:						
6.14	Rect	Planocon	122.4	(88.6)	53.4	Greenstone

Table 51. Ground Stone Ornaments

Acc. No.	Shape	Cross-Section	Length	Width	Thick	Raw Material
4.01	Rect	Tabular	37.9	27.7	15.0	Sandstone
70.01	Rect	Tabular	(48.5)	41.7	4.4	Slate
70.03	Dipyramidal	Rectang	74.6	18.5	11.5	Slate
153.01	Rect	Tabular	(58.9)	36.2	9.3	Slate

Ground Stone Ornaments (Figure 94; Table 51)

Four ground stone ornaments were recovered from the Skegemog Point site. Two of the specimens appear to be rectangular gorget fragments. They have straight edges, thin, tabular cross-sections, and are manufactured from slate. Their surfaces are well smoothed with faint, linear, manufacturing related striations still visible. One ornament (153.01) has short hatch or "tally" marks every 4 to 6 mm along its lateral edges.

A third specimen identified as an ornament appears to have been a pendant. It has an asymmetrical dipyramidal shape and a nearly square cross-section at the widest point. There are fine incised lines around the point of maximum circumference and around the proximal end. These fine grooves are presumed to have aided in the suspension of the object. It is manufactured from a piece of slate.

The fourth ornament does not appear to have been completed. It is rectanguloid with a tabular cross-section and was manufactured from a small piece of porous sandstone. An incompletely drilled hole, measuring 12 mm in diameter and 7.3 mm deep, is located at the approximate center of the pendant. The specimen is otherwise unmodified.

Unidentified Ground Stone Fragments (Figure 94)

Included here are six fragmentary specimens for which no specific tool type identification was possible. Three of these consist of small fragments on which at least a portion of one surface is ground and polished smooth. A fourth specimen (4.01) exhibits flake scars on the intact face and edges. Further one end has been incised prior to snapping it in order form a straight edge. This specimen is unfinished and may have been intended to be a gorget. The surface of a fifth specimen (47.05) also shows remnants of the rough percussion flaking used to form it. Finally, the sixth fragmentary specimen (87.01) consists of a small piece of burned sandstone with linear striae on the intact surface. Given the raw material and the nature of the striations this specimen may be from a grinding implement fragment.

Hammerstones (Table 52)

Hammerstones are represented by 13 specimens. They are ovoid cobbles with primarily ovoid cross-sections. Plano-convex, wedge, and triangular cross-sections are also represented. The size of the cobbles ranges between 49.2 mm and 87.5 mm in length, 38.3 mm and 71.7 mm wide, and 28.1 mm and 37.1 mm thick, and averages of 66.5 mm, 52.9 mm, and 37.1 mm, respectively. A number of different rock types were selected, but sandstone and granite predominate. All of the specimens exhibit battering on one or both ends of the cobble. Lateral edges are damaged on four specimens. The ventral face of two specimens (44.05 and 172.07) shows evidence of

Figure 94. Ground Stone Ornaments and Unidentified Ground Stone Fragments

Row 1: Ground Stone Ornaments

Row 2: Unidentified Ground Stone Fragments

Figure 95. Anvilstones, Abraders and Coarse Stone Tool Preform

Row 1: Anvilstones

Row 2: (Specimens 1-2) Abraders

Row 2: (Specimen 3) Coarse Stone Tool Preform



Figure 94.



Figure 95.

Table 52. Hammerstones

Acc. No.	Shape	Cross-Section	Length	Width	Thick.	Raw Material
1.02	Ovoid	Square	49.2	38.3	31.4	Granite
28.07	Circ	Ovoid	60.2	59.5	36.2	Granite
42.02	Ovoid	Planocon	69.9	50.4	28.1	Igneous
44.05	Circ	Ovoid	59.8	53.8	29.9	Sandstone
50.01	Ovoid	Ovoid	74.3	55.6	44.2	Sandstone
57.01	Ovoid	Wedge	65.6	63.7	42.2	Granite
58.01	Ovoid	Ovoid	57.8	45.2	36.4	Sandstone
74.02	Ovoid	Ovoid	69.4	55.9	42.2	Sandstone
84.03	Ovoid	Ovoid	(88.0)	68.9	42.9	Unident.
106.01	Ovoid	Ovoid	61.4	50.1	36.2	Granite
171.06	Oval	Ovoid	64.5	41.5	36.7	Granite
172.04	Ovoid	Triang	87.5	48.9	43.1	Gabbro
172.07	Ovoid	Planocon	78.7	71.7	38.7	Igneous

Table 53. Anvilstones

Acc. No.	Shape	Cross-Section	Length	Width	Thick.	Raw Material
9.01	Ovoid	Tabular	92.3	75.9	46.3	Granite
19.02	Ovoid	Wedge	82.3	72.1	45.2	Diabase
29.06	Rect	Tabular	81.7	74.1	28.5	Siltstone
70.02	Triang	Rect	92.9	59.6	46.7	Granite
81.01	Ovoid	Biconvex	85.5	78.6	40.5	Sandstone
156.02	Rect	Tabular	74.3	48.7	20.7	Siltstone
164.02	Ovoid	Tabular	76.5	65.6	37.3	Sandstone
171.06	Ovoid	Ovate	79.9	68.1	46.7	Diorite
180.02	Ovoid	Planocon	65.6	61.0	11.1	Siltstone
182.02	Rect	Rect	44.3	73.5	47.4	Granite
183.01	Ovoid	Tabular	94.2	85.0	46.8	Quartzite

smoothing and appear to have been used as manos. Additionally, 4 manos and 3 anvilstones, described below, show evidence of auxiliary use as hammerstones. Hammerstones are suitable for a wide variety of pounding purposes.

Anvilstones (Figure 95; Table 53)

Eleven glacial cobbles exhibit concentrated areas of pitting on one or both faces commensurate with use as an anvil. The cobbles are ovoid to rectangular in shape and tabular to flattened ovoid in cross-section. The cobbles are medium sized, averaging 79.0 mm in length, 69.3 mm wide, and 37.9 mm thick. Damage tends to be located in the center of the cobble and was present on both faces in four instances. Areas of pitting are generally circular in shape ranging between 15 mm and 30 mm in diameter. Additionally, one grinding slab and two manos described below exhibit small areas of pitting resulting from auxiliary use as anvils. Slightly less than one-third of the specimens occur on fine grained sedimentary rocks, while the rest occur on igneous rock types. The sole exception is one anvil manufactured from a quartzite cobble. Anvils are typically associated with flint working activities, especially bipolar methods of reduction.

Manos (Table 54)

Thirty-five cobbles have been classified as manos. Virtually all of the specimens have ovoid shapes. Six are rectangular, two are triangular, and the shape of two specimens was not determinable. Cross-section shapes range primarily between ovoid (N=13), plano-convex (N=9), tabular (N=8), wedge, (N=4), and indeterminate (N=1). Igneous rock types were preferred for use as manos, particularly granite. Fine grained sedimentary rocks were employed as the tool blanks in 11 instances.

Because the source material consists of glacial cobbles, which 8 are often naturally striated and polished, it was necessary to employ a conservative assessment of the use-wear present on the specimens. Evidence of use consists of the smoothing one or more surfaces, and it is frequently accompanied by fine pitting of the surface. Striations are usually linear and on a number of specimens they are oriented in a number of different directions. Two specimens (6.06 and 8.07) exhibit small areas of concentrated pitting related to use as an anvil on one face. Four specimens (47.08, 106.01a, 106.01b, and 163.01) were also employed as hammers. In one instance, the battering covered approximately half of the cobble's circumference. Manos are typically associated with the processing of plant foods and other prepared dishes. A recent article by Adams (1988), however presents archaeological and ethnographic evidence that similar tools were used during the processing of hides in the Southwestern United States and the Plains region. It is unclear if such tools were employed in a similar fashion by the inhabitants of the Upper Great Lakes.

Table 54. Manos

Acc. No.	Shape	Cross- Section	Length	Width	Thick.	Raw Material
6.06	Ovoid	Ovoid	72.1	64.2	51.9	Unident. ign.
7.01	Ovoid	Planocon	59.7	52.3	34.6	Granite
7.06	Ovoid	Tabular	45.1	41.2	27.4	Granite
8.07	Indeter	Wedge	(52.5)	49.9	38.3	Diabase
13.01	Ovoid	Ovoid	70.1	60.0	44.0	Unident ign.
20.01	Ovoid	Ovoid	76.7	69.9	48.4	Sandstone
47.08	Circ	Wedge	57.4	52.1	30.0	Gabbro
51.02	Ovate?	Tabular	(53.5)	(39.0)	28.5	Sandstone
53.02	Rect	Tabular	(57.1)	(80.3)	24.4	Siltstone
54.01	Rect	Ovoid	45.7	43.4	28.2	Granite
62.01	Rect	Tabular	98.9	60.0	44.6	Siltstone
65.01	Ovoid	Wedge	(55.1)	53.4	26.5	Granite
87.01	Indeter	Indeter	(49.1)	(44.3)	(36.6)	Siltstone
106.01a	Circ	Ovoid	70.0	65.0	38.0	Unident ign.
106.01b	Ovoid	Ovoid	70.4	36.7	27.2	Unident ign.
147.03a	Ovoid	Ovoid	129.4	62.4	41.3	Granite
147.03b	Ovoid	Planocon	60.0	42.5	30.3	Granite
153.02	Ovoid	Ovoid	115.8	88.1	46.1	Granite
154.03	Ovoid	Ovoid	83.3	72.1	44.7	Sandstone
163.01	Ovoid	Ovoid	96.0	68.3	43.9	Sandstone
171.06a	Ovoid	Ovoid	67.5	48.6	29.2	Unident ign.
171.06b	Rect	Triang	61.0	52.0	46.8	Unident ign.
171.06c	Ovoid	Planocon	49.3	45.5	25.2	Unident ign.
171.06d	Ovoid	Planocon	73.5	50.0	32.6	Quartzite
171.06e	Triang	Tabular	101.7	81.2	54.9	Unident.
172.06	Ovoid	Planocon	50.4	35.8	21.1	Sandstone
172.07	Ovoid	Ovoid	75.3	65.7	35.9	Granite
176.03	Ovoid	Tabular	73.1	57.4	28.5	Sandstone
178.01	Rect	Tabular	61.4	48.8	28.3	Sandstone
181.01	Ovate	Ovoid	75.2	57.8	34.3	Sandstone
182.03	Triang	Planocon	85.2	69.6	38.7	Gabbro
183.02a	Ovoid	Planocon	60.0	54.4	23.6	Granite
183.02b	Circ	Planocon	83.7	79.6	50.4	Sandstone
184.01	Ovoid	Tabular	67.7	51.4	19.3	Granite
184.02	Ovate	Planocon	70.1	48.2	35.8	Diabase

Grinding Implements (Figure 96; Table 55)

Eighteen specimens have been identified as functioning primarily as grinding implements. This group has been subdivided into two groups based on size. The first group contains 13 specimens and consists of large stone slabs which are considered to be true metates or milling stones. Although two-thirds of the specimens are fragmented, they appear to have had rectangular shapes and thick, tabular cross-sections. Specimens range between 69.6 mm and 128.5 mm in length, 64.7 mm and 188.0 mm wide, and 29.5 mm and 93.2 mm thick. Some of the fragmentary specimens most assuredly exceeded these dimensions prior to breaking. A slight preference for finer grained sandstones and siltstones as a raw material was noted for this group of grinding slabs. One specimen is burned.

Use wear generally consists of fine linear striations and pitting of the utilized face. The striations run parallel to the long axis of the tools. In four instances one surface is slightly dish-shaped from use. One other specimen exhibits similar heavy use on two opposing faces. These tools are presumed to have functioned primarily for processing various plant resources and other foods for both consumption and storage. Their size also suggests that they were not readily portable tools.

Five specimens are smaller than the previous group both in terms of their length and width, but thickness, as well. Because of their smaller size they would not have been well suited to large scale food processing activities. Functional assessment is unclear at this stage.

The smaller grinding surfaces are either rectangular or ovoid in shape and tabular to plano-convex in cross-section. They range between 60.0 mm and 121.5 mm in length, 42.5 mm and 78.9 mm wide, and 27.3 mm and 42.5 mm thick. As with the first group, these specimens exhibit linear striations and pitting on the flattest face of the cobble. One specimen (96.01) exhibits a small area of pitting which probably resulted from auxiliary use as an anvil.

Abrading Stones (Figure 95)

Two abrading stones are present in the assemblage. Functionally, they are believed to have played a role in the fabrication of other tools and items of material culture. One specimen (31.05) is a large ovoid sandstone cobble measuring 147.0 mm in length, 113.6 mm wide, and 71.5 mm thick. A large, U-shaped groove running parallel to the long axis of the cobble is present on one face. The groove is 105.5 mm long, 14.3 mm wide, and 5.5 mm deep and its surface is finely pitted and striated. The opposite face of the cobble has a small area of anvil related pitting in its center. The specimen has been burned.

The second abrading stone is a small end fragment. It probably had a rectangular shape and a tabular cross-section. There are two parallel grooves on one

Figure 96. **Grinding Implements**

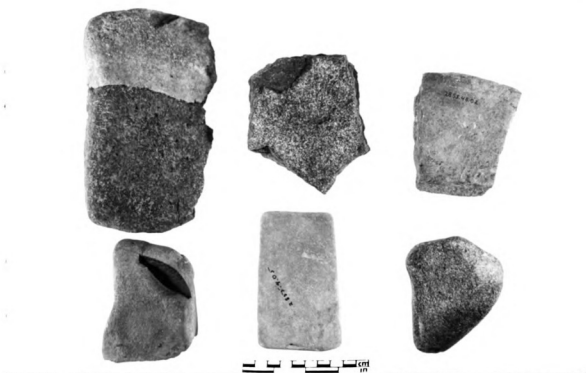


Figure 96.

Table 55. Grinding Implements

Acc. No.	Shape	Cross-	Length	Width	Thick	Raw Material	Size
2.17	Rect	Tabular	121.5	66.0	42.5	Gabbro	Small
4.05	Rect	Tabular	107.8	66.6	27.3	Siltstone	Small
6.04	Indeter	Tabular	(114.3)	(95.3)	59.1	Diorite	Large
7.06	Indeter	Indeter	(155.0)	(87.8)	(83.2)	Granite	Large
40.05	Indeter	Indeter	(60.8)	(100.9)	(61.7)	Diabase	Large
40.07a	Rect	Rect	(96.4)	78.4	50.8	Diabase	Large
40.07b	Rect	Planocon	(100.5)	188.0	93.2	Diabase	Large
46.00	Square	Tabular	69.9	65.6	36.0	Granite	Large
48.02	Rect	Tabular	(75.0)	(88.0)	29.5	Sandstone	Large
51.02	Trapezoid	Rect/Tab	111.8	64.7	43.6	Sandstone	Large
51.11	Ovoid	Tabular	128.5	86.0	51.7	Diorite	Large
96.01	Ovoid	Tabular	94.5	78.9	29.9	Sandstone	Small
171.03	Ovoid	Planocon	91.1	81.6	44.6	Amphibolite	Large
171.06a	Indeter	Planocon	(47.1)	(32.4)	(36.9)	Sandstone	Large
171.06b	Indeter	Indeter	(81.4)	(47.4)	(42.0)	Granite	Large
171.06c	Rect	Wedge	81.5	57.1	38.2	Igneous	Small
172.04	Rect	Tabular	128.4	117.7	58.2	Sandstone	Large
174.01	Ovoid	Planocon	60.0	42.5	30.3	Granite	Small

face. They are both 2.5 mm wide and 1.5 mm deep and are approximately 20 mm apart. This specimen was manufactured from a fine grained sandstone and has been burned.

Maul

A single maul was recovered from between 1.5 and 1.8 feet deep in the "food pit" or cache pit (Unit 179) excavated at Skegemog Point. It is a blunt ended, ovate-shaped tool with a plano-convex cross-section. The specimen measures 108.3 mm in length, 66.9 mm wide, and 39.8 mm wide. Both edges exhibit pecked indentations, presumably used for hafting purposes. There is also a small area of pitting in the center of the flat face possibly resulting from movement of the stone in its haft. The broadest end exhibits several facets produced from heavy blows. It is manufactured from a medium sized igneous cobble.

Coarse Stone Preform (Figure 95)

A single preform for an unidentified coarse stone tool type is represented in the collection. It is a medium sized ovoid cobble with a wedge shaped cross-section. The preform is 93.1 mm long, 63.8 mm wide, and 39.5 mm thick. It exhibits coarse percussion flaking primarily on one face. Flaking is bifacial along one lateral edge. A siltstone cobble served as the raw material.

Unidentified Coarse Stone Tool Fragments

Nine specimens of unidentified form or function complete the coarse stone tool inventory at the Skegemog Point site. They are not considered further in this analysis.

PREHISTORIC METALLIC ARTIFACTS

A single copper bead is present in the collection from the Skegemog Point site. It is a small tubular bead manufactured by rolling up a thin strip of copper. The bead measures 23.0 mm long and 6.6 mm in diameter. Although the bead was recovered from Level 1 contexts (Unit 180) in an area of the site (Area 1) that exhibits a fair amount of Historic period debris, it is considered to date to the Late Woodland occupation based on morphological and technologic similarities to specimens recovered by McPherron (1967:171, Plate XXXVIII) at the Juntunen site.

APPENDIX 3

SKEGEMOG POINT SITE CERAMIC CODE GUIDE AND ATTRIBUTE LIST

INTRODUCTION

The purpose of this study is to examine the potential of ceramics as indicators of social interaction and boundary maintenance in the Carolinian-Canadian transition zone of western Michigan. This guide provides the terms and definitions of the ceramic attributes (technological and decorative) examined in this study. The coding form is designed to describe the morphology of these vessels with an emphasis placed on the nature and structure of the decorative characteristics. Further, it is an attempt to systematically examine a population of ceramic vessels without the influence and biases introduced by reliance on the current ceramic typologies for the region. The purpose is not to ignore such information, since it is relevant, but to better understand the nature and meaning of the similarities and differences present among the ceramic vessels under study. This coding form has been developed from a number of key sources (Cleland n.d.a.; Holman 1978; Hughes 1967; Hurley and Wagner 1972; Lovis 1973; McHale-Milner 1988), as well as from my own observations and familiarity with the Skegemog Point collection.

1. **SITE:** The site name includes both its common name (e.g., Skegemog Point, Point Arcadia) and its trinomial number (e.g., 20GT2, 20MT120). The most commonly used name is listed first.
2. **PROVENIENCE:** All site specific provenience information is recorded here. For an excavated site, this includes the unit number, level, feature, areas within levels (e.g., pottery concentrations). For a unexcavated site this is usually the surface. Occasionally the surface will be subdivided into several different areas. In those cases where a vessel cross cuts a number of provenience units, all of the units should be recorded in the order of frequency of sherds from highest to lowest. The general rule of thumb is to record as much provenience information as possible for a specific vessel.
3. **VESSEL NUMBER:** This is a unique number assigned to each vessel in this analysis. Typically, vessels from any given collection are sequentially numbered from one to infinity. Provisions are also made for the addition of an alphabetic prefix to some of the collections in order to immediately identify the collection of origin (e.g.,

MS = Missaukee Preserve, collections made by Greenman, University of Michigan, at the Aetna I and II and Boven earthworks).

4. **TYPE:** This is the provisional type designation to which a particular vessel may be or already has been assigned to.

The major choices are:

Bowerman ware	Traverse ware
Allegan ware	Juntunen ware
Mackinac ware	Dumaw Creek ware
Skegemog ware	Wayne ware

Where familiarity or other criteria allow a designation of a specific ceramic type (e.g., Skegemog Collared, Traverse Scalloped, Bowerman Plain) this should also be recorded. In the case of the vessels from Skegemog Point, the original type names assigned by Cleland (n.d.a.) should also be recorded.

5. **ORIGINAL VESSEL DESIGNATION:** This category pertains primarily to the vessels from Skegemog Point and other sites curated at the MSU Museum. The vessels from Skegemog Point, in particular, have under gone a number of different numbering systems during both the preliminary analysis (Cleland n.d.a.) and that conducted by Lovis (1973). Vessels may be designated in number of fashions. The primary designation is usually a piece of note card with the vessel type and number (e.g., Skegemog Collared Vessel 1). Other designation systems include a number on a small piece of masking tape; a red number painted on the sherd interiors; a white number painted on the sherd interiors; a number written on a piece of note card with no vessel type identification (these cards often have two numbers written on opposite sides of the card); a designation written on the bottom of the box it is in; or combination of these numbering systems. All designations present should be recorded with a clear notation as to type of designation in parentheses (e.g., TP=tape, R=red inked number, W=white inked number, etc.).

6. **COMMENT:** This space is for any additional information concerning site, provenience, or original vessel designations that do not fit above. Any particular information about the vessels context (e.g., feature association, pottery concentrations, high/low density areas, C-14 dates, stone tools, flora or fauna, other vessels, etc.) may also be included, if the information is readily available.

GENERAL INFORMATION

This portion of the code form provides a brief general characterization of the vessel. Standard morphologic and technologic information is recorded here.

7. **GENERAL DESCRIPTION:** A brief description of the vessel is all that is necessary here. Whenever possible the description should include three types of information. First, the basic vessel type (e.g., jar, bowl, miniature pot, storage vessel), shape (e.g., globular, carinated, conoidal, pointed base, etc.), size (large, medium, small), and other relativistic terms such as the degree of neck constriction and lip and/or rim eversion. Most of the vessels in northern Michigan are globular jars of varying sizes with varying degrees of neck constriction (none to great) and lip and/or rim eversion (none to extreme). Thus, a typical vessel may be described as a small, undecorated globular jar with moderate neck constriction and extreme lip and rim eversion. Second,

general decorative information (e.g., simple punctated vessel with impressed lip, finger pinched, scalloped or peaked lip, complex decoration composed of several different decorative elements, undecorated, etc.) is noted. Third, the general representation of the vessel (i.e., the number and different types of sherds and their general sizes) is also recorded.

8. **VESSEL REPRESENTATION:** The purpose of this category is to specify the proportion of the vessel represented.

8a. **SIZE (L X H):** Overall dimensions of the fragment. Length is measured along the rim with a piece of string or by rolling it along a ruler. This accounts for the curvature of the vessel. Height is the vertical height of the fragment.

8b. **BREAK LOCATION:** General description of the location of where the vessel is broken (ex. horizontally across top of the neck, obliquely from top of neck to shoulder, etc.).

8c. **COMMENT:** Any thoughts on the characteristics and/or morphology of the vessel representation and its fragmentation. The weight of the vessels from the Skegemog Point should be recorded here.

9. **VESSEL DIMENSIONS:** These are all metric attributes. If it is not possible to obtain a particular measurement write "indeterminate" in the space.

9a. **RIM DIAMETER:** This is the diameter of the vessel exterior where it rests on a horizontal plane. Choose the closest fit to the chart and feel free to use a range of diameters (ex. 5 to 8 cm) if the exact diameter is not measurable. As with all metric attributes, if there are doubts about the confidence of the measurement, they should be noted.

9b. ORIFICE DIAMETER: The maximum diameter of the interior edge of the vessel.

9c. NECK DIAMETER: The maximum diameter of the point of greatest constriction in the neck. This point is referred to as the "inflection point" of the neck.

9d. SHOULDER WIDTH: This is the point of maximum width at the shoulder of the vessel. It is rare that enough of the vessel is present for this attribute to be collected.

9e. VESSEL HEIGHT: Total height of the vessel. This measurement requires a rim to base profile. This is also a very rare measurement.

9f. LIP ANGLE: This is the angle between the plane formed by the interior edge of the lip and a horizontal plane.

9g. RIM ANGLE: This is the angles between the plane formed by interior edge of the rim and a horizontal plane.

9h. NECK ANGLE: This is the angle between the planes formed by interior edge of the rim and upper half of the neck and the interior edge of the lower neck below the inflection point

9i. BODY ANGLE: This is the angle between a plane formed by the body below the point of maximum inflection and a horizontal plane.

10. PASTE: Paste is difficult to characterize verbally. Basically, there are three components to the paste; 1) texture (silty, sandy), 2) structure (laminar, contorted, blocky, compact) and, 3) hardness or the degree of compaction of the ceramic body (compact, hard/dense, moderate, friable, flaky). Texture refers to the texture of the clay used to manufacture the vessel. Silty pastes are very fine grained and often have a "slippery" feel to them. Sandy pastes, on the other hand, generally have a rough feel and the individual sand grains are often visible in the paste. A sandy paste is considered to be a coarse textured paste, while a silty paste is a fine textured paste. These are the extremes, so there is a middle ground between the two.

The structure of the paste refers to the macroscopic structure of the paste. In laminar pastes, horizontal bedding or layering of the paste can be seen. Massive pastes are structureless (this is a common structure for the sandier pastes). That is, all that can be seen is a unstructured mass of grains composing the paste. Blocky pastes have a rough blocky profile along a broken edge. Finally, contorted pastes are similar to laminar pastes except the laminae are contorted and irregular (other than just around pieces of temper).

Hardness or the degree of compaction here refers to two aspects; the actual hardness of the vessel in and the degree to which the ceramic body is compacted during its

manufacture. A friable body is crumbly and readily disintegrates to the individual particles comprising the paste. This is common among coarse, sandy paste vessels. Compact describes pastes that are "tight" in their structure (ex. the individual laminae are very close and narrow) and they tend to be dense and relatively hard.

11. **TEMPER** Temper is an aplastic material added to the clay in order to improve the firing qualities of the ceramics.

11a. **SIZE:** Size of the average piece of tempering agent. The size categories used here are derived from Fitting (1965:12):

Fine (0-1 mm)
 Fine to Medium
 Medium (1-2 mm)
 Medium to Coarse
 Coarse (2-3 mm)
 Very coarse (3+ mm)
 Poorly sorted (random mix of particle sizes)

11b. **PERCENT:** Percentage of the paste made up by temper. Use a grain density scale to determine this value. The choices are: 1%; 3%; 5%; 10%; 20%; 30%; 40%; and 50%. Feel free to use bracketed estimations if unsure (e.g., 1-3%, 5-10%).

11c. **TYPE:** This refers to the type of material used as the tempering agent. The ceramics used in this study will almost always be grit tempered, although occasionally, some will be sand tempered. Sand and grit tempers can be differentiated with aid of the hand lens. The sand grains will be well rounded and "frosted", whereas particles of grit will be rough and angular. For grit temper there are 3 choices: felsic (light colored, such as quartzite), mafic (dark colored, such as granite), or mixed (both light and dark colored temper). If it is easily identified, also note the specific type of rock being used (quartzite, granite, gabbro, unidentified igneous, etc.).

12. **MANUFACTURE TYPE:** This refers to the method used to construct the ceramic vessel. There is a wide range of different manufacturing methods which have been employed throughout time. The ceramics in this study tend to be manufactured by one of the following methods: slab and anvil; coiled; hand-molded or pinched; and indeterminate. Slab and anvil involves building the vessel up by joining a series of slabs together. This appears to be the most common method used during the Late Woodland period in the northern Great Lakes area. Coiling builds the vessel up by joining a series of horizontal coils. Hand-molding is a method of forming the vessel from a lump of clay.

13. INTERIOR SURFACE TREATMENT: Records the final treatment of the interior surface of the vessel. The choices are:

- 1: Wiped - interior exhibits wipe marks from the final smoothing. These marks are generally oriented horizontally, are broad, and have shallow basin-shaped cross-sections.
2. Brushed- similar to wiped, but the striations are narrow and their cross-sections are closer to a V-shape.
3. Smoothed- surface is smooth without the presence of any striations.
4. Indeterminate/Other- surface treatment is unclear.

13a. DECORATED: Is any type of decoration present? Yes or No.

13b. DIMPLED: Is the interior surface dimpled? Yes or No.

14. EXTERIOR SURFACE TREATMENT: Records the final surface treatment or preparation applied to the exterior of the vessel. In this study, this aspect of the ceramic vessel is considered to function as a decorative background. As such, it falls into the realm of decorative attributes. Further, a number of different surface preparations are often present on a single vessel, especially on the Traverse ware vessels. Allowances are made below for these situations.

The surface treatment options employed here are the same as used for the classification of the body sherds. The choices are:

- Cordmarked (specify fine, medium and coarse variety)
- Smoothed cordmarked (specify variety)
- Cord-wrapped dowel (specify fine, medium or coarse variety)
- Smoothed cord-wrapped dowel (specify variety)
- Fabric and Smoothed fabric
- Smoothed

Attribute 14 contains several parts. The first space is for general notations on the surface treatment, if warranted.

14a. ZONED: Is the vessel surface divided into two or more zones of differential surface preparation? Yes or No.

If Yes, then record the number of different zones present on the vessel fragment in the next space.

14b to 14f. VESSEL ZONES: For the purposes of this study, The vessels have been subdivided into a series of four primary zones or fields. These are the traditional vessel segments of rim, neck, shoulder, and body. A fifth category has been added to

handle any unforeseen relevant variation. In those cases where more than one surface treatment is employed the method used on each zone should be recorded. For each zone, three different pieces of information need to be recorded. First, is the type of surface preparation employed (i.e., cordmarked, smoothed, etc.). Second, the orientation of the surface treatment. Choices here are: vertical, oblique left, oblique right, criss-crossed, random/unpatterned, and other. Third, is whether there is any decoration present within a particular zone (yes or no). Although the lip is technically a separate zone of the vessel it is not included here for several reasons. If it is added to the above zones, then virtually all vessels will be considered zoned in terms of their surface treatment and it will lose its analytic usefulness. Lip treatments are traditionally kept separate from the remainder of the vessel exterior during analysis and have been shown to vary independently of the vessel exterior surface preparation.

14g. **CORDAGE INFORMATION:** This records the physical attributes of the cordage employed in the surface treatment. Since the collection of this series of attributes repeats in a number of different parts of this code form, their collection is discussed separately below.

15. **COLOR:** This is a general characterization of the color of the vessel interior and exterior. Munsell color designations are not used.

16. **RESIDUE:** Notes the presence of carbonized residue or "crud" on the vessel fragment. If it is present, the location of its occurrence and the relative amount (i.e., little, medium amount, a lot, etc.) should be briefly noted.

17. **SOOT:** Are there soot stains on the vessel interior or exterior? The presence of sooting on the vessel is an indication that it functioned as a cooking vessel.

18. **COMMENT:** Any general comments about the overall shape, size and character of the ceramic vessel which are not more appropriately noted in any of the above categories may be placed under this heading.

LIP CHARACTERISTICS

19. **FORM:** Lip form refers to the shape of the lip plane. The choices here are:

- Flat
- Castellated
- Peaked
- Scalloped
- Other/Indeterminate

If the lip plane of the vessel is peaked, castellated, or scalloped, a series of attributes are collected concerning their size and periodicity.

19b. Number of peaks or castellations present on the vessel fragment. A space is also provided for a projected total for the entire vessel circumference, when an accurate estimation is possible.

19c. This is the linear distance between peaks or castellations. Usually only a single measurement is possible, but in those rare instances where there is more than one the average should be recorded, as well as the range.

19d. The width and height of the peak/castellation is recorded here.

19e. This section deals with scalloped lips. The width and depth of the scallops are recorded first. Tool used refers to the type of tool used to form the scallops. The choices are:

Cordwrapped dowel
 Plain dowel
 Paddle edge (specify if plain or cord-wrapped paddle)
 Finger
 Other tool (specify)

20. PROFILE: This is the shape of the lip in cross-section. The choices are:

Flat	Rolled (or folded)
Wedge	Rolled/flattened
Outside bevel	Rolled/beveled
Inside bevel	Rounded
Splayed	V-Shaped
Other	

21. LIP THICKNESS: This is the thickness of the lip across a horizontal plane.

22. LIP TREATMENT: Refers to the nature of the surface preparation of the lip plane. The choices are the same as those listed for the exterior surface treatment of the vessel. In the case of cordmarked or fabric impressed, specimens the orientation of the elements should also be noted. Choices for treatment orientation included: perpendicular (long axis of the elements run perpendicular to the lip plane and circumference of the vessel), parallel (runs along the lip plane and the vessel circumference), oblique left, oblique right, criss-crossed, other. A section for recording the specifics of the cordage employed is also provided.

23. LIP THICKENED: Is the lip thickened in some fashion? Yes or No. If it is, note the method of thickening where appropriate (folded, applique, etc.)

24. DEGREE OF EVERSION: This refers to the degree to which the lip of the vessel rolls outward. Be careful not to confuse lip eversion with rim eversion. Quite often the lips and rims of the vessels under study are everted to the same degree.

However, on some of the vessels dating to the earlier portions of the Late Woodland period (i.e. Skegemog and Mackinac wares) the lip is everted to a greater degree than the rim. The choices are: none, slight, moderate, great, and other/indeterminate.

25. **LIP DECORATED:** Response here is Yes or No. (A brief indication of the nature of the decoration may also be included).

26. **COMMENT:** Any general comments concerning the overall nature of the lip in terms of its configuration, relative size, eversion, decoration, etc. which is not recorded elsewhere in this section.

RIM CHARACTERISTICS

27. **RIM PROFILE:** This refers to the shape of the vessel rim in cross-section. The choices for this attribute are:

Collared
Straight
Wedge
Thickened at the lip
Beaded/Filleted
Other/Indeterminate

28. **RIM SHAPE:** This refers to the degree of eversion of the vessel rim. The choices include:

None
Slight eversion
Moderate eversion
Great or extreme eversion

If the vessel rim is everted, the form of the eversion in cross-section is also recorded. The choices are straight or flat and curved.

29. **COLLARED:** This attribute only applies to those vessels which are collared.

29a. Is the vessel collared? Yes or No.

29b. If the vessel is collared, a series of descriptive attributes are collected. The first of which is how well defined the collar is. The choices are: weak, moderate, and well defined.

29c. Cross-section is the cross-sectional shape of the collar. The choices are:

Square
Round
Wedge
Other (specify)

29d. Relative height refers to a subjective characterization of the vertical height of the collar. The choices are: high (large collar), medium, and low (short collar).

29e. Height is the measured height of the collar from its base to the intersection with the exterior margin of the lip.

29f. Thickness is the maximum thickness of the collar. A notation should be made as to where to point of maximum thickness occurs (i.e., top, middle, bottom).

29g. Neck thickness is recorded here to provide a contrast against the thickness of the collar. The true thickness of the collar is arrived at by subtracting the thickness of the neck just below the collar from the thickness of the collar.

30. BEAD/FILLET/APPLIQUE: This basically refers to rim thickening elements which occur below the lip of the vessel. Typically, they occur on the middle or lower portions of the rim. The first response is Yes or No. If yes, it is necessary to measure the distance between the vessel lip and the bead/fillet/applique. The measurement should be taken to the top margin of the bead/fillet/applique. The second attribute recorded is the measured height of the bead/fillet/applique. The third attribute recorded is the thickness of the bead/fillet/applique. The thickness should be collected in the same fashion as with the thickness measurement for collars.

31. RIM THICKNESS: The measured thickness of the rim and the location of the measurement. If the rim narrows in one direction or the other, give the minimum and maximum thicknesses and where they occur.

32. RIM HEIGHT: The measured height of the rim.

33. TREATMENT: This refers to the surface preparation of the rim of the vessel. This category repeats information recorded under Attribute 14b.

NECK AND SHOULDER CHARACTERISTICS

34. DEGREE OF CONSTRICTION: Records the amount of neck constriction present on a vessel. The choices are:

None
Slight
Moderate
Extreme

35. **NECK TREATMENT:** This attribute repeats information recorded under Attribute 14c. Space is also been provided for cordage information, where present.

36. **DECORATED:** Is the neck decorated? Yes or No. A very brief notation of the type of decoration present may be included.

37. **NECK THICKNESS:** Measured thickness of the neck. Note if it is an even thickness. If not, record the minimum and maximum thicknesses.

38. **SHOULDER SHAPE:** Shape of the shoulder in cross-section. The choices are:

Straight
Gently rounded
Marked globular/rounded
Carinated
Other (specify)
Indeterminate

39. **SHOULDER TREATMENT:** This attribute repeats information recorded under Attribute 14d. Space is also been provided for cordage information, where present.

40. **DECORATED:** Is the shoulder of the vessel decorated? Yes or No. A very brief notation of the type of decoration present may be included.

VESSEL DECORATION

41. **GENERAL DESCRIPTION:** A very brief general description of the overall decoration present on a vessel.

42. **DECORATION TYPE:** This refers to the overall structure of the decorative elements. The choices are:

Rows of elements (space is present between the individual design elements)
Continuous linear (ex., drag-jab)
Continuous linear with interrupting field or castellation (specify which)
Configuration band
Combination (e.g., element/linear, linear/band. Always specify the types forming the combination.)
Other (specify)

42a. **SIMPLE/COMPLEX:** Is the overall decoration on the vessel simple (composed of one type of decorative element) or complex (composed of two or more different decorative elements). Circle the appropriate choice.

43. **DECORATION FORM:** This refers to the method or type of decoration employed. The choices are:

Punctate (Surface is jabbed with a sharp or pointed tool; impression is usually at a 90 degree angle)

Impressed (Surface is indented or stamped by tool being pushed into the clay, impression is usually at less than a 90 degree angle.)

Drag-jab (Alternately impressing and dragging the tool across the surface without lifting it up between impressions. Usually accomplished with a flat ended tool.)

Incised (Surface is scored with a sharp pointed tool. The cross-section is generally narrow and V-shaped.)

Trailed (Surface is impressed by a larger, generally dull ended tool, such as a finger. The cross-section is usually relatively broad, shallow, and U-shaped.)

Pinched (Impression created by pinching the wet clay between two or more fingers.)

Other (Specify)

44. **TOOL TYPE:** Specify the type of tool used to create the decorative element. The choices are:

Cordwrapped stick

Cordwrapped dowel

Cordwrapped paddle

Cordwrapped cord

Cordwrapped object

Plain tool (specify type: stick, dowel, or paddle)

Plied or replied cord

Twisted cord/knot

Other (specify)

Indeterminate

In those cases where two or more different tools are employed list them sequentially from the lip of the vessel on down.

44a. **PORTION USED:** The part of the tool employed (i.e., the end, edge, or corner) to make the decorative element.

44b. **CROSS-SECTION:** Cross-sectional shape of the tool employed. This primarily refers to sticks. Choices are:

Rectangular	Circular
Square	Hollow Circular
Triangular	Ovoid/Ovate
Crescent	Other (specify)
Hemisphere	Indeterminate

45. **DECORATION LOCATION:** Indicate the presence of decoration in the major fields of the vessel.

46. **COMMENT:** Any general comments or information not recorded in the above section.

LIP DECORATION

47. **PRIOR PREPARATION:** Surface treatment of the lip plane as well as the interior and exterior margins of the lip. The choices are the same as those for the exterior surface treatment of the vessel (Attribute 14).

48. **ORIENTATION:** Orientation of the surface preparation. The choices include:

Vertical
Horizontal
Oblique right
Oblique left
Criss-crossed
Other (specify)/Indeterminate

49. **CRENATED:** Does the lip plane have a crenated shape resulting from the placement of decorative elements on the interior and exterior lip margin. Yes or No.

50 - 58. This section records specific information concerning the size and structure of decoration place on the lip of the vessel. The lip is subdivided into three segments: the interior margin (or corner), the lip surface or plane, and the exterior margin. If no decoration is present on any of these three areas of the vessel "None" should be written in the first space.

50. **TYPE:** Technique used to create the decorative element. The choices are the same used for Attribute 43.

51. **TOOL:** Tool employed in creating the decoration. Options are the same used for Attribute 44.

52. ORIENTATION: Angle (direction) at which the tool intersects the ceramic surface. The choices are:

Perpendicular (straight in)
 Angled left
 Angled right
 Angled up
 Angled down
 Other (specify)

53. ROBUSTNESS: This refers to the degree of boldness in the execution of the decoration. That is, the relative depth of the impression. The choices are:

Shallow
 Medium
 Deep
 Very deep (creating boss or node on the vessel interior or exterior)
 Pushed through

54. ELEMENT SHAPE: Record the shape of the individual decorative element. The choices are:

Rectangular
 Square
 Circular
 Ovoid/Ovate
 Hemispherical
 Lunate or crescent
 Other (specify)
 Indeterminate

55. IMPRESSION ANGLE: Refers to the orientation or alignment of the individual decorative elements. The choices are:

Perpendicular (or straight in)
 Vertical
 Horizontal
 Oblique right
 Oblique left
 Other (specify)/Indeterminate

56. ELEMENT SIZE: Metric attributes of the individual elements.

56a. LENGTH: The long axis of the element (generally is the vertical dimension).

56b. WIDTH: The short axis of the element (generally the horizontal dimension).

56c. **DEPTH:** The maximum depth of the element.

57. **ELEMENT SPACING:** The measured distance between individual decorative elements. Record the average or most representative distance. Note if the spacing of the decorative elements is consistent/even or staggered. If staggered, record the shortest and the longest intervals between elements (this situation should only be rarely encountered).

58. **CORDAGE:** Size and twist of cordage employed.

59. **COMMENT:** Note any aspect concerning the nature and structure of the decoration on the lip of the vessel which has not been recorded in the above section.

RIM INTERIOR

60. **TYPE:** The technique employed in creating the decoration. The options are the same as those used for Attribute 43.

61. **COMPLEXITY:** Simple (single decorative band) or compound (two or more individual decorative bands).

62. **TOOL:** Tool employed in executing the decoration. The options are the same as Attribute 44.

63. **DESIGN/MOTIF STRUCTURE:** Describes the overall structure of the decorative band(s) on the rim interior. The options are the same as used for Attribute 42.

64. **NUMBER OF BANDS:** The number of separate decorative bands present on the rim interior.

65. **NUMBER OF ROWS PER BAND:** The number of rows of individual decorative elements comprising each band of decoration.

66. **ROBUSTNESS:** The relative depth of the decoration. The choices are the same as used for Attribute 53.

67. **DISTANCE BELOW LIP:** Measured distance from the exterior lip margin to the top and the bottom of the decorative band.

68. **BAND WIDTH:** Vertical height of the decorative band(s).

69. **ROW WIDTH:** Vertical height of individual row(s) comprising a band of decoration.

70. **DISTANCE BETWEEN BANDS/ROWS:** Measured distance.

71. **ELEMENT SHAPE:** Shape of the individual decorative elements. The choices are the same as those used for Attribute 54.

72. **ELEMENT SIZE:** The measured length, width, and depth of the individual decorative element.

73. **CORDAGE:** Size and twist of the cordage employed.

74. **DISTANCE BETWEEN ELEMENTS:** Horizontal distance between individual decorative elements. Same information as recorded for Attribute 57.

EXTERIOR DECORATION

75. **GENERAL DESCRIPTION:** A very brief description of the overall decorative pattern on the exterior of the vessel.

76. **FULL DECORATION PRESENT:** Yes or No.

77. **DESIGN COMPONENT:** Refers to the overall structure of the entire decorative pattern. The choices are the same as those used for Attribute 42.

78 - 100. This section records the specific information relating to the morphology of the decorative bands and their composite elements for each sub-area or field of the vessel.

78. **FIELD SURFACE PREPARATION:** Final surface treatment of each of the vessel fields. This attribute repeats information recorded under Attribute 14.

79. **ORIENTATION:** Refers to the orientation of the surface preparation, where relevant.

80. **DECORATION FORM:** Technique employed to execute the decoration. The choices are the same used for Attribute 43.

81. **DESIGN/MOTIF:** The overall structure of the design within a particular field. The choices are the same as used for Attribute 42.

82. **DESIGN SHAPE:** Refers to the orientation of the design field. The choices are:

- Linear
- Linear oblique
- Chevron
- Curvilinear
- Other (specify)

* The response will almost always be linear.

83. **COMPLEXITY:** Is the design simple or complex?
84. **TOOL USED:** Tool employed in executing the decoration. The choices are the same as used for Attribute 44.
85. **TOOL ANGLE:** Direction the tool is oriented when creating the element. The choices are the same as used for Attribute 52.
86. **POSITION WITHIN FIELD:** This records the relative placement of the decorative band within a particular field. The choices are:
- Top
 - Middle
 - Bottom
87. **DISTANCE BELOW LIP:** The measured distance between the lip plane and the top of the decorative band.
88. **NUMBER OF BANDS:** Number of separate decorative bands within a particular field.
89. **BAND HEIGHT:** Measured height of the decorative band(s).
90. **DISTANCE BETWEEN BANDS:** Vertical distance between separate decorative bands.
91. **NUMBER OF ROWS PER BAND:** Number of separate rows of elements comprising a single decorative band.
92. **ROW HEIGHT:** Vertical height of the individual rows of elements.
93. **DISTANCE BETWEEN ROWS:** Vertical distance between individual rows of elements within a single decorative band.
94. **ROBUSTNESS:** The relative depth of the decoration. The choices are the same as used for Attribute 53.
95. **ELEMENT SHAPE:** Geometric shape of the individual decorative element. The choices are the same as used for Attribute 54.
96. **IMPRESSION ANGLE:** This refers to the orientation of the long axis of the individual decorative elements. The choices are the same as used for Attribute 55.
97. **ELEMENT SIZE:** Records the length, width and depth of the individual decorative elements.

- 98. **DISTANCE BETWEEN ELEMENTS:** Horizontal distance between individual decorative elements.
- 99. **CORDAGE:** Size and twist of the cordage employed.
- 100. **COMMENT:** Any general comment concerning the decoration of the vessel not covered in the above section.

FINAL ATTRIBUTE LIST

Vessel Number:
 Provisional Type:
 Original Type:

Oriface Diameter: metric in cm
 Neck Diameter: metric in cm; reliability not always good
 Rim >: degrees; vertical = 90 degrees
 Lip >: degrees; vertical = 90 degrees
 Neck >: degrees; vertical (no neck)= 180 degrees

Paste:

Texture: Coarse Sand	1	Density: Friable	1
Fine Sand	2	Mod Compact	2
Silty	3	Compact	3
Other	4	Very Compact	4
		Other	5
		Indeterminate	6

Temper:

Size: Fine	1	Percent: 1-3	1
Medium	2	5-10	2
Coarse	3	11-19	3
		20+	4

Exterior Surface Treatment: Zoned	1
Not Zoned	2
Indeterminate	3

Surface Preparation Type: Fine Cordmarked	1
Medium Cordmarked	2
Coarse Cordmarked	3
Fabric Impressed	4
Smoothed Fine Cordmarked	5
Smoothed Medium Cordmarked	6
Smoothed Coarse Cordmarked	7
Smoothed Fabric Impressed	8
Smooth	9
Other	10
Indeterminate	11

Surface Preparation Pattern:

Horizontal/Vertical	1
Horizontal/Vertical/Oblique Left	2
Oblique Left/Vertical	3
Oblique Right/Vertical	4
Vertical/Oblique Left	5
Horizontal/Oblique Left	6
Oblique Left/Oblique Right	7

Vertical Smoothed Impressed/Vertical	8
Oblique Right Smoothed Impressed/Vertical	9

Oblique Left Smoothed Impressed/Oblique Left 10
 HorizontalSmoothedImpressed/Vertical Smoothed Impressed 11

Vertical/Smooth 12
 Vertical/Smooth/Vertical 13
 Horizontal/Smooth 14
 Oblique Right/Smooth 15
 Oblique Left/Smooth 16

Vertical Smoothed Impressed/Smooth 17
 Oblique Left Smoothed Impressed/Smooth 18
 Oblique Left Smoothed Impressed/Smooth/Vertical 19
 Oblique Right Smoothed Impressed/Smooth 20

Smooth/Vertical 21
 Smooth/Vertical Smoothed Impressed 22

Vertical 23
 Oblique Left 24
 Oblique right 25
 Vertical Smoothed Impressed 26
 Oblique Left Smoothed Impressed 27
 Oblique Right Smoothed Impressed 28
 No Orientation Impressed 29
 No Orientation Smoothed Impressed 30
 Smooth 31

LIP CHARACTERISTICS

Lip Form: Flat	1	Lip Profile: Flat	1
Scalloped	2	Rounded	2
Peaked	3	Wedge	3
Castellated	4	Exterior Bevel	4
Other	5	Splayed	5
Indeterminate	6	Rolled/Flat	6
		Rolled/Beveled	7
		Rolled/Rounded	8
		Other	9
		Indeterminate	10

Surface Treatment: Fine Cordmarked	1
Medium Cordmarked	2
Coarse Cordmarked	3
Fabric	4
Smoothed Fine Cordmarked	5
Smoothed Medium Cordmarked	6
Smoothed Coarse Cordmarked	7
Smoothed Fabric	8
Smooth	9
Other	10
Indeterminate	11

Surface Treatment Oreintation: Vertical	1
Horizontal	2
Oblique Left	3
Oblique Right	4
No Direction	5
Indeterminate	6

Lip Thickened: Yes 1

Lip Eversion: Yes 1

No 0

No 0

Lip Thickness: Measurement in mm

RIM CHARACTERISTICS

Rim Shape:		Rim Profile:	
Straight	1	Straight	1
Curvilinear	2	Wedge	2
Indeterminate	3	Thickened to Lip	3
		Collared	4
		Pseudo-collared	5
		Beaded/Filleted	6
		Indeterminate	7

Degree of Eversion:	None	1
	Slight	2
	Moderate	3
	Extreme	4
	Indeterminate	5

Relative Rim Height:	Short	1
	Medium	2
	High	3
	Indeterminate	4

Collar Shape:	Square	1	
	Wedge	2	
	Round	3	
	Other	4	
			Indeterminate 5

Collar Definition:	Weak	1
	Well Defined	2
	Bold	3
	Indeterminate	4

Relative Collar Height:	Short	1
	Medium	2
	High	3
	Indeterminate	4

NECK AND SHOULDER CHARACTERISTICS

Degree of Constriction:	None	1
	Slight	2
	Moderate	3
	Extreme	4
	indeterminate	5

Neck Thickness: Measured in mm

Shoulder Shape:	Straight	1
	Very Gently Rounded	2
	Gently Rounded	3
	Rounded	4
	Sharply Rounded/Carinated	5
	Indeterminate	6

Shoulder Thickness: measured in mm

VESSEL DECORATION

RIM INTERIOR

Decorated: Yes	1	Type: Punctate	1
No	0	Impressed	2
		Pinched	3
		Drag-Jab	4
		Incised	5
		Trailed	6
		Other	7
		Indeterminate	8

Motif: Row of Elements	1	
Continuous Linear	2	
Continuous Linear with Interrupting Field	3	
Interrupted Linear	4	
Configuration Band	5	
Combination	6	Indeterminate 7

Tool: Finger End/Nail	1
Cordwrapped Stick End- Pointed	2
Cordwrapped Stick Edge	3
Cordwrapped Cord	4
Cord/Replied Cord	5
Knot/Kinked Cord	6
Plain Stick End- Pointed	7
Plain Stick End- Dull	8
Plain Stick Edge	9
Plain Tool End- Ragged	10
Plain Tool End- Chisel	11
Plain Tool End- Dull	12
Plain Tool Edge	13
Plain Paddle End	14
Plain Paddle Edge	15
Plain Paddle Corner	16
Cordwrapped Paddle End	17
Cordwrapped Paddle Edge	18
Cordwrapped Paddle Corner	19
Indeterminate	20

Tool Angle: Straight In	1
Angled Up	2
Angled Down	3
Angled Right	4
Angled Left	5
Indeterminate	6

Decoration Location (within field): Top	1
Center	2
Bottom	3
Entire	4
Indeterminate	5

Number of Rows: 1 to N

Secondary Decorative Element: Yes	1
No	2

Robustness: Shallow	1
Medium	2

Deep	3
Pierced	4
Indeterminate	5

Element Shape: Rectangular	1
Rectangular-Linear	2
Square	3
Ovoid/Oval/Ovate	4
Circular	5
Lunate/Crescent	6
Linear	7
Chevron	8
Indeterminate	9

Element Length, Width, and Depth: Measured in mm

Impression Angle: Vertical	1
Horizontal	2
Oblique Right	3
Oblique Left	4
Combination	5
Indeterminate	6

Element Distance: Measured in mm

LIP DECORATION

Lip Decorated: Yes	1
No	0

Location: Surface	1
Interior	2
Exterior	3
Interior/Exterior	4
Interior/Surface	5
Exterior/Surface	6
Continuous	7

Type: Punctate	1
Impressed	2
Pinched	3
Drag-Jab	4
Incised	5
Trailed	6
Other	7
Indeterminate	8

Tool: Finger End/Nail	1
Cordwrapped Stick End- Pointed	2
Cordwrapped Stick Edge	3
Cordwrapped Cord	4
Cord/Replied Cord	5
Knot/Kinked Cord	6
Plain Stick End- Pointed	7
Plain Stick End- Dull	8
Plain Stick Edge	9
Plain Tool End- Ragged	10
Plain Tool End- Chisel	11
Plain Tool End- Dull	12
Plain Tool Edge	13
Plain Paddle End	14
Plain Paddle Edge	15
Plain Paddle Corner	16
Cordwrapped Paddle End	17

Cordwrapped Paddle Edge	18
Cordwrapped Paddle Corner	19
Other	20
Indeterminate	21
Tool Angle: Straight In (Perpendicular)	1
Angled Left	2
Angled Right	3
Angled Up	4
Angled Down	5
Pinched	6
Looped	7
Other	8
Indeterminate	9
Robustness: Shallow	1
Medium	2
Deep	3
Pierced	4
Other	5
Indeterminate	6
Element Shape: Rectangular	1
Rectangular-Linear	2
Square	3
Ovoid/Oval/Ovate	4
Circular	5
Crescent (Lunate)	6
Linear	7
Chevron	8
Other	9
Indeterminate	10
Element Orientation: Vertical	1
Horizontal	2
Oblique Right	3
Oblique Left	4
Combination	5
Indeterminate	6
Element Length, Width, and Depth: Measured in mm	
Element Distance: Measured in mm	
Relative Distance: Close	1
Medium/Wide	2

EXTERIOR DECORATION

Exterior Decorated: Yes 1
No 2

Motif Orientation: Linear- Horizontal 1

Linear- Vertical	2
Linear- Oblique Right	3
Linear- Oblique Left	4
Curvilinear-Horizontal	5

Band Location: Rim	1
Collar	2
Neck	3
Shoulder	4
Rim and Neck	5
Collar (edge) and Neck	6
Neck and Shoulder	7
Other	8
Indeterminate	9

Band Position: Top	1
Middle	2
Bottom	3
Entire	4
Spans	5
Other	6
Indeterminate	7

Band Number of Rows: Record number of rows present (note if incomplete)

Band Motif: Row of Elements	1
Continuous Linear	2
Continuous Linear with Interrupting Field	3
Interrupted Linear	4
Configuration Band	5
Combination	6
Indeterminate	7

Band Type: Punctate	1
Impressed	2
Pinched	3
Drag/Jab	4
Incised	5
Trailed	6
Other	7
Indeterminate	8

Tool: Finger End/Nail	1
Cordwrapped Stick End- Pointed	2
Cordwrapped Stick Edge	3
Cordwrapped Cord	4
Cord/Replied Cord	5
Knot/Kinked Cord	6
Plain Stick End- Pointed	7
Plain Stick End- Dull	8
Plain Stick Edge	9
Plain Tool End- Ragged	10
Plain Tool End- Chisel	11
Plain Tool End- Dull	12
Plain Tool Edge	13
Plain Paddle End	14
Plain Paddle Edge	15
Plain Paddle Corner	16

Cordwrapped Paddle End	17
Cordwrapped Paddle Edge	18
Cordwrapped Paddle Corner	19
Other	20
Indeterminate	21

Tool Angle: Straight In (Perpendicular)	1
Angled Left	2
Angled Right	3
Angled Up	4
Angled Down	5
Right to Left ("Pinched")	6
Other	7
Indeterminate	8

Element Robustness: Shallow	1
Medium	2
Deep	3
Pierced	4
Indeterminate	5

Element Shape: Rectangular	1
Square	2
Circular	3
Ovoid/Oval/Ovate	4
Hemispherical	5
Lunate	6
Linear	7
Wedge/Triangular	8
Crescent	9
Other	10
Indeterminate	11

Element Length, Width, and Depth: Measured in mm

Element Orientation: Vertical	1
Horizontal	2
Oblique Right	3
Oblique Left	4
Combination	5
Other	6
Indeterminate	7

Element Spacing: Measured in mm

Sequence repeats for each band of decoration. Bands are numbered sequentially from top to bottom.

APPENDIX 4

COMPARATIVE SITES

This appendix provides a brief introduction to each of the sites and collections used for the regional analysis. The sites are ordered from north to south.

Henderson Lamb

The Henderson Lamb site is located in Section 12 of Helena Township, Antrim County. Lying along the north side of the Clam River where it enters Clam Lake Cleland (1967b:7) has described the site as an extensive Late Woodland village comparable in size to the Skegemog Point site. Only limited test excavations have been conducted at the site in 1966 by Michigan State University. The recovered ceramics are clearly associated with a Traverse phase occupation. A single radiocarbon date of 500 ± 100 B.P. (M-2063) is available from the site (Michigan State University Museum site files). This date converts to a calibrated age of A.D. 1422 with intercepts at A.D. 1325, 1422, and 1451 (Stuiver and Becker 1986). Twenty-one vessels from the site were used in this analysis.

Schuler

The Schuler site is located in Section 12 of Whitewater Township, Antrim County. The site is situated on an Algoma age beach ridge on the north shore of Skegemog Lake near the connecting narrows to Elk Lake (Cleland 1967b:6). A small number of test units were excavated at the site in 1966 by Michigan State University field crews. The recovered ceramics from this site are associated with a Traverse phase occupation of the site. A single radiocarbon date of 970 ± 120 B.P. (M-1867) has been reported from the site (Cleland 1967b:6; Crane and Griffin 1968:84). This date converts to a calibrated age of A.D. 1025 with intercepts at A.D. 980, 1025, and 1210 (Stuiver and Becker 1986). Thirteen vessels from the site were used in the analysis.

Santer (20BZ21)

The Santer site is located in Section 25 of Lake Township, Benzie County along the north shore of Platte Lake. The primary occupation of this site is assigned to the early late Woodland period on the basis of ceramic similarities to Spring Creek and Mackinac ware. A minor Archaic component is also represented at the site. The site

has been destroyed and the collection examined here is held by the landowners. A total of seven vessels from the site are used here.

Aetna I (20MA11) and Aetna II (20MA12)

The Aetna I and Aetna II sites are located in Section 16 of Aetna Township, Missaukee County. Separated by only about 600 m these two circular enclosures and associated burial mounds and cache pits have been well known for many years. They were the focus of professional investigations by Greenman in 1925-1926 and joint Michigan State University and Western Michigan University field teams in 1965 (Garland n.d.). Both sites have also been extensively pothunted (e.g., Butterfield et al. 1955; Gibson and Herrick 1957; Moll et al. 1958).

Aetna I is the smaller of the two enclosures measuring 178 ft in diameter (Baldwin n.d.). It has been the focus of most of the excavations. The Aetna II enclosure is slightly larger, measuring 185 ft in diameter (Baldwin n.d.). A series of approximately 98 cache pits are located a short distance south of the enclosures and several burial mounds are located to the north of them (Butterfield et al. 1955; Greenman 1927b; Hinsdale 1931). A radiocarbon date of 750 ± 150 B.P. (M-790) has been reported from a nearby burial mound (Crane and Griffin 1961:109-110). This date converts to a calibrated ages of A.D. 1264, 1268, and 1276 with intercepts at A.D. 1132-1136, 1160-1330, 1352-1365, and 1365-1390 (Stuiver and Becker 1986). The place of earthen enclosures in Late Woodland settlement systems continues to be unclear. Of the many suggestions as to site function which have been put forward over the years, designation as some type of habitation site is favored here.

The recovered ceramics from both sites are clearly associated with the Traverse phase. Collections from the 1925-26 and 1965 excavations are used for this analysis. A sample of 17 vessels are used from the Aetna I site and 12 vessels are used from the Aetna II site.

Boven (20MA19)

The Boven earthwork is located in Reeder Township, Missaukee County, a short distance from the Aetna earthworks. This circular enclosure was also investigated by Greenman (1927b) and Cleland and Baldwin (n.d.). Excavations in 1965 revealed the presence of a palisade at the site. A single radiocarbon date of 480 ± 100 B.P. (M-1768) has been reported from the site (Crane and Griffin 1968:79). This date converts to a calibrated age of A.D. 1429 with intercepts at A.D. 1329, 1429, and 1479 (Stuiver and Becker 1986).

Only two vessels were usable for this analysis. They were included on the basis of geographic proximity to the larger samples from the Aetna enclosures.

Point Arcadia (20MT120)

The Point Arcadia site represents an extensive occupation site with components ranging from the Late Archaic through late Late Woodland periods. Ceramics associated with the early late Woodland occupation of the site were recovered primarily from the western tip of the site (Ursum 1985). The tool assemblage from this part of the site indicates that the occupation may have been more logistic than residential in character. During the late phase of the Late Woodland the site appears to have functioned as a warm season residential locale (Hambacher 1989). A small amount of corn, which produced an anomalously early radiocarbon date of 2210 ± 85 B.P. (Beta 25753), has been recovered from this occupation (Hambacher 1989). The site has been destroyed for a housing development.

The collection used here was borrowed from John Williams, Arcadia, Michigan. A total of 15 early phase and 59 late phase vessels are used in this analysis. This sample was augmented by two vessels recovered from a pit eroding from the Lake Michigan shore approximately one mile north of the Point Arcadia site.

McGlynn (20MT122): The McGlynn site is located in Section 32 of Manistee Township, Manistee County. The site is situated along the first terrace of the Manistee River and overlooks Thatches Bayou. The site appears to represent one of a number of occupation loci stretching along this portion of the Manistee Valley. Periodic excavations have been conducted at the site by members of the Manistee Chapter of the Michigan Archaeological Society. The collection used in this study is housed at the Manistee County Historical Society. Forty-three early phase and four late phase vessels are used in this analysis.

Manistee Blacker Airport Site 3 (20MT48)

This site is one of a cluster of approximately 10 sites located along the first terrace of the Manistee River in Section 33 of Manistee Township, Manistee County. Disturbance of the sites by road grading activities led to several investigations which have been summarized by Mead (1979). The initial collection made by John Williams, Arcadia, Michigan from Airport 3 were used in this study. The sample includes twelve early phase vessels and two late phase vessels.

Fifth Avenue Beach

The Fifth Avenue Beach site is located on the north side of the mouth of the Manistee River in Section 2 of Filer Township, Manistee County. This site has been heavily impacted by sand mining operations and other industrial and recreational modifications to the mouth of the Manistee River. The four late phase vessels from this site area used in the analysis were derived from private collections held by John Williams, Arcadia, Michigan and Dan Ursum, Manistee, Michigan.

Magoon Creek (20MT87)

The Magoon Creek site is located in Section 28 of Filer Township, Manistee County along the north side of Magoon Creek where it enters Lake Michigan (Ursum 1980). The limited test excavations conducted at the site by Ursum suggest that the site is a small occupation site similar to the Porter Creek South site. Collections from this site are housed at the Manistee County Historical Society. Six early phase vessels from this site are used in the analysis.

Ursum Collection

A series of eight early Late Woodland vessels from the private collection of Dan Ursum, Manistee, Michigan were also included in this analysis. These vessel fragments occurred as isolated finds occurring in at least three locales along the north side of the Manistee River where it enters Manistee Lake. These locales are within one-half mile of one another and are located in Section 31 of Manistee Township, Manistee County. Two late phase vessels from the Porter Creek North (20MN101) and Hamlin Lake (20MN87) sites in this collection were also used.

Porter Creek South (20MN100) and Porter Creek North (20MN101)

These two sites are located on opposite sides of the mouth of Porter Creek in Section 28, T 20N, R 18W. Excavations conducted at the Porter creek South site indicate that it is a seasonal encampment dating primarily to the early Late Woodland period (Holman and Hambacher 1989). A minor late Late Woodland component was also identified. Most of the ceramics from the site were originally described as Spring Creek related wares (Holman and Hambacher 1989:79-99). A sample of 32 early phase vessels and one late phase vessel are available from this site.

A single vessel fragment assignable to the late Late Woodland period from the Porter Creek North site has been included here.

Robert Green Collection

This collection is currently housed at the Michigan State University Museum, East Lansing, Michigan. In addition to materials from the Dumaw Creek site (discussed below), this collection contains a number of vessel fragments from the area around Bear Lake and north eastern Mason County.

Two early Late Woodland vessels from Sheridan Township were included in the analysis as were five late phase vessels from the Bear Swamp area and Sheridan Township. Although these few vessels are widely scattered geographically, they were included to supplement the sample of design variability for the southern end of the Manistee Valley.

Gywnne Cushman Collection

This collection contains vessel fragments from four sites clustered around the southern end of Arnold Lake and the northern end of Cranberry Lake in Section 1 of Hayes Township and Section 6 of Hamilton Township, Clare County. The four sites are the J. Wood site (20CE27), the Public Fish site (20CE43), the Firing Area site (20CE28), and the Arnold Lake site (20CE44). A fifth site, the Hayes Township hall site (20CE31), is located a short distance to the southeast in Section 16 of Hayes Township. Unsystematic excavations of these sites took place during the mid to late 1960s, and all of them appear to be largely destroyed at this time. Recovered ceramics are exclusively associated with the late Late Woodland period and exhibit stylistic affinities with Traverse ware. The collection is housed at the Michigan State University Museum.

The sample sizes for each of these sites is as follows; twenty-three vessels from 20CE27, thirteen vessels from 20CE43, seven vessels from 20CE28, four vessels from 20CE44, and three vessels from 20CE31.

Custer-Walhalla Survey of the Pere Marquette River

A small sample of six vessels were used from this survey. All of the vessels used in this analysis were recovered from the Quick or Notapekagon site (20MN20). Single vessels are also represented from the Cable and Larsen sites. Sufficient information was not available from these latter vessels to include them in the analysis. These sites were tested in 1971 as part of a broader survey of this portion of the Pere Marquette Valley (Nowak and Fisher 1971). The collections from this survey are housed at the Michigan State University Museum.

Dumaw Creek (20OA5)

The Dumaw Creek site, located in Section 5 of Weare Township, is an extensive occupation site which has been well known since the early part of this century (Quimby 1966). As a result it has been heavily disturbed by random digging. The site is generally characterized as a proto-Contact Potawatomi village (Quimby 1966). A single radiocarbon date of 280 ± 150 B.P. (M-1070) dates the occupation of the site (Crane and Griffin 1961:110; Quimby 1966:80-82). This date converts to a calibrated age of A.D. 1642 with intercepts at A.D. 1440-1690, 1724-1810, and 1926-1955 (Stuiver and Becker 1986). The general size of the site and density of material present may indicate a greater time depth to the occupation than is typically acknowledged.

The ceramic sample from the Dumaw Creek site was derived from three collections; the Chicago Field Museum of Natural History, the Robert Greene collection at Michigan State University, and the Schrupf collection at the University of Michigan. A fourth collection from the site is housed at the Grand Rapids Public Museum, but could not be located in time to be included in this analysis. Interestingly, each of the collections exhibit its own "stylistic flavor" with differing degrees of

similarity to more southern styles such as Moccasin Bluff ware and more northern styles such as Traverse ware. Thus, a total of forty-one vessels from the site are used in this analysis.

Silver Lake (200A35)

The Silver Lake site is located along the shore of Lake Michigan in Golden Township, Oceana County. A small amount of material eroding from a sand dune was collected by Edward Gillis and George Davis of Grand Rapids, Michigan. Cleland (1966a:79-80) reports that the faunal from the site reflects a agriculturally based population and Fitting (1975:179) has interpreted the site as an example of a summer residence site of the Ottawa pattern. The site is associated with the late phase of the Late Woodland period. Information on the seven vessels used in this analysis was derived from records on file at the Michigan State University Museum.

Juniper Beach (200A2)

The Juniper beach site is also located in Golden Township, Oceana County, near the Lake Michigan shore. Luedtke (1976:465, 468-469) indicates that the site was surface collected by Fitting and Peske in 1962. Information on the eight early phase vessels used in this analysis was derived from records on file at the Michigan State University Museum. Two vessels from this site are also in the collections at the Grand Rapids Public Museum.

Little Pebawma Village

The Little Pebawma Village site is located in the northeast corner of Oceana County between Little Pebawma Lake and Pebawma Lake. The small collection from this site is derived from initial shovel testing of the site conducted by John Davis, Huron-Manistee National Forests. A small sample of ceramics have been recovered from the site. Five late phase vessels were used in this analysis. An additional Allegan-like vessel has also been identified at the site. It as not included in this study.

20GR91

Site 20GR91 is located within the city limits of Alma, Michigan near the Pine River. Excavations totaling 172 square meters in area have been conducted at the site by Tracy Luke and Scott Beld, Alma College. The site has been interpreted as a generalized hunting and gathering encampment (Beld 1990:65-66). A radiocarbon date of 610 ± 40 B.P. with a calibrated age of A.D. 1284 has been reported from the site (Beld 1990:66). Although 20GR91 technically lies outside of the defined limits of the study area, it was included because it represents a significant late Late Woodland site showing clear similarities to the late phase ceramics from the Skegemog Point site. It also served to add a southern data point for the late phase analysis. A total of twenty-two vessels from the site are used in this analysis.

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