WHOSE POT IS THIS? ANALYSIS OF MIDDLE TO LATE WOODLAND CERAMICS FROM THE KITCHIKEWANA SITE, GEORGIAN BAY ISLANDS NATIONAL PARK OF CANADA

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ABSTRACT

Whose Pot Is This? Analysis of Middle to Late Woodland Ceramics from the Kitchikewana Site, Georgian Bay Islands National Park of Canada

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Archaeological interpretation of Ontario's Middle to Late Woodland period is dominated by rigid taxonomic categories that confound archaeologists in potential boundary areas where assemblages may appear diverse. Analyses of attribute frequency, diversity, and clustering of an assemblage of 57 Middle to Late Woodland pottery vessels from the Kitchikewana site on Beausoleil Island in southern Georgian Bay, is undertaken to examine the diversity of the assemblage and to examine its relationship with comparative Point Peninsula and Saugeen pottery assemblages. I find the Kitchikewana assemblage has traits of both traditions, the diversity is not unique and is caused by temporally changing styles, and there are limited pottery connections to the ceramic taxonomies of either tradition. I conclude Middle Woodland pottery was made within a continuum of change from one area to another with each location having its own regional variations that are best explained in an ethnogenesis informed perspective. Accordingly, geographically broad typological constructs have little relation to ethnic or social groupings, and the existing taxonomic structure is seriously flawed.

KEY WORDS

Point Peninsula, Saugeen, Algonquian, Iroquoian, Middle Woodland, Late Woodland, Transitional, Pottery, Cluster Analysis, Diversity Analysis, Gower's Coefficient of Similarity, Unweighted Pair-Group Method Using Arithmetic Averages, Simpson's Diversity Index, Beausoleil Island, Georgian Bay, Archaeological Cultures, Ethnicity, Ethnogenesis

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TABLE OF CONTENTS

LIST OF TABLES

Page

LIST OF FIGURES

Page

CHAPTER 1: INTRODUCTION

Since the inception of archaeology in Ontario, the proto-historic Indigenous cultures south of the Canadian Biotic Province have dominated archaeological studies (Ferris and Spence 1995; Wright 1999b). Whether this is a result of biased sampling due to development or by choice, it has left a vacuum of archaeological information relating to the cultures in the southeastern Georgian Bay area of central Ontario. There is, accordingly, a bounty of unanswered questions regarding the precontact occupations of this region. Taxonomic affiliations, settlement patterns, subsistence strategies, ideology, ethnolinguistic affiliations, and societal structures within the region are largely unknown.

Furthermore, the existing interpretive model is largely based on outdated taxonomies derived from cultural-historical notions of bounded social groups that are defined largely by material culture patterning. In flawed applications of the direct historic approach, these past bounded social groups have come to be seen as the direct ancestors of historic and modern ethnolinguistic groups (i.e., Algonquian and Iroquoian). The assumption of the existence of culture-historical based dendritic descent lineages, perceived archaeologically from incremental changes in material culture, have been used to stretch ethnolinguistic ancestry into Ontario's ancient past. This has confounded interpretations of the origins of modern ethnolingustic groups notable in the ongoing debate of in-situ or intrusive Iroquoian ancestry in the Northeast. This debate is of relevance in this study of Middle Woodland pottery given the current taxonomic divisions of Ontraio into the Saugeen, Point Peninsula, and Laurel traditions. These traditions are often placed into direct descent lineages to historic Algonquin or Iroquoian groups in pro in-situ arguments (e.g., Crawford and Smith 1996; Curtis 2004b; Smith and Crawford 1995; Wright 1966), or are used conversely to demonstrate temporal contrasts in material culture thus reifying intrusive theories (e.g., Snow 1995). Today there are newer interpretive models using an ethnogenesis perspective (Moore 1994) that accepts the relatively unbounded social groups we perceive on the landscape and deconstructs the existing taxonomic framework (e.g., Hart 2011; Hart and Brumbach 2003, 2005, 2009; Hart and Englebrecht 2011). Ethnogenesis acknowledges that the congruence of material culture patterns are epiphenomenal, that groups are always in a state of becoming and that defining ethnolinguistic identity from material culture is highly problematic (Martin 2008). Ethnogenesis, rather than a culture-historical framework, is shown to be a more applicable interpretive model in this study of pottery from a site near the material culture defined border of the Saugeen and Point Peninsula traditions.

Beausoleil Island, in the southern end of Georgian Bay, is the largest of the 59 islands comprising Georgian Bay Islands National Parks of Canada, a small preserve of the larger 30,000 islands of southern Georgian Bay (Figure 1). On the protected eastern shore of Beausoleil Island sits the Kitchikewana archaeological site. The site is named for the Camp Kitchikewana which leases the property encompassing the majority of the archaeological site (Figure 2). Camp Kitchikewana was established on Beausoleil Island in 1919 along the sandy shore of Beausoleil Bay. Today the camp is operated by the YMCA of Simcoe/Muskoka and hosts over 600 youth per year.

Archaeological investigations between 1989 and 2007 at the Kitchikewana site, led by Parks Canada's National Parks and Native Sites Senior Archaeologist Brian D. Ross, amassed a wealth of artifactual evidence primarily from what has been termed a

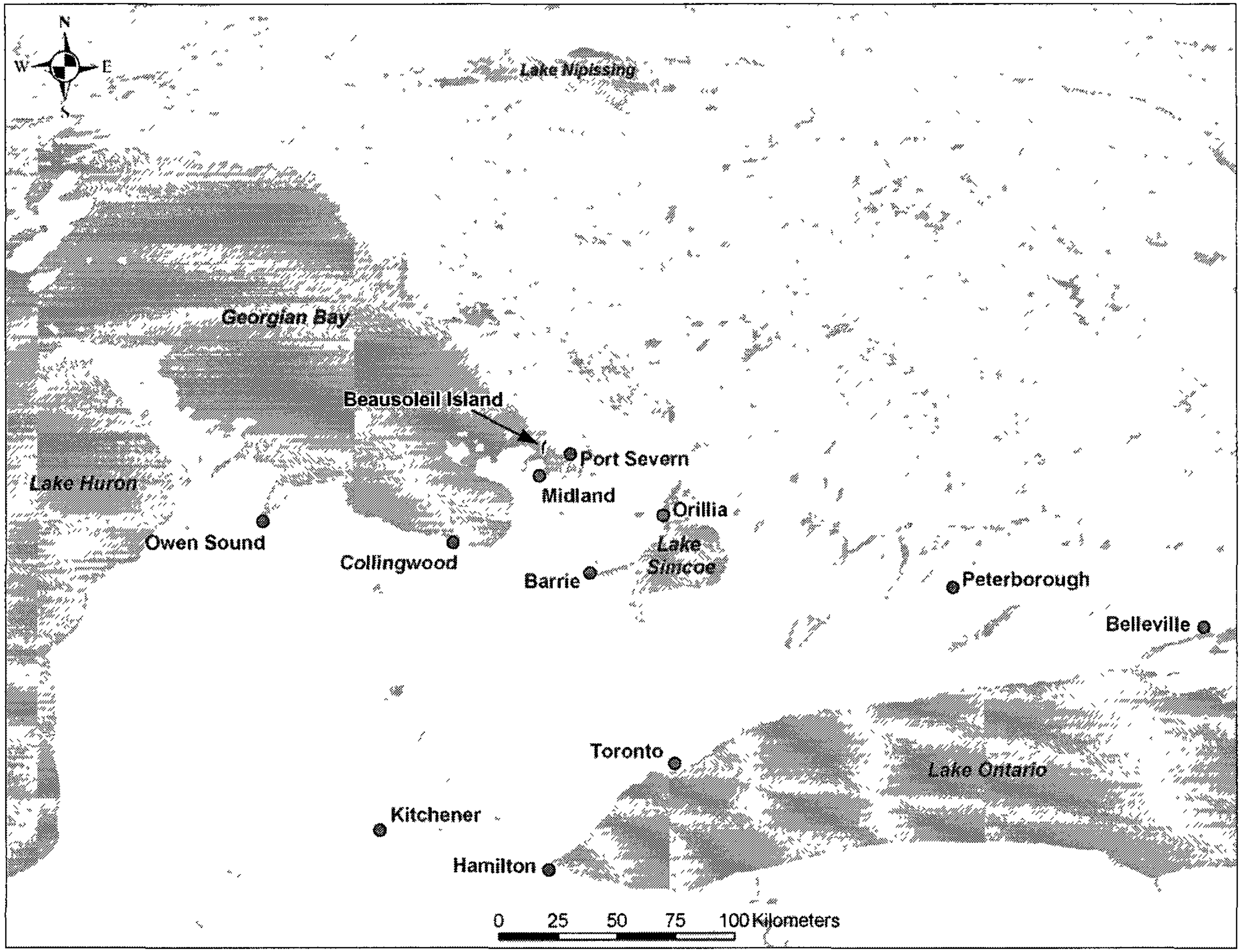


Figure 1. Location of Beausoleil Island

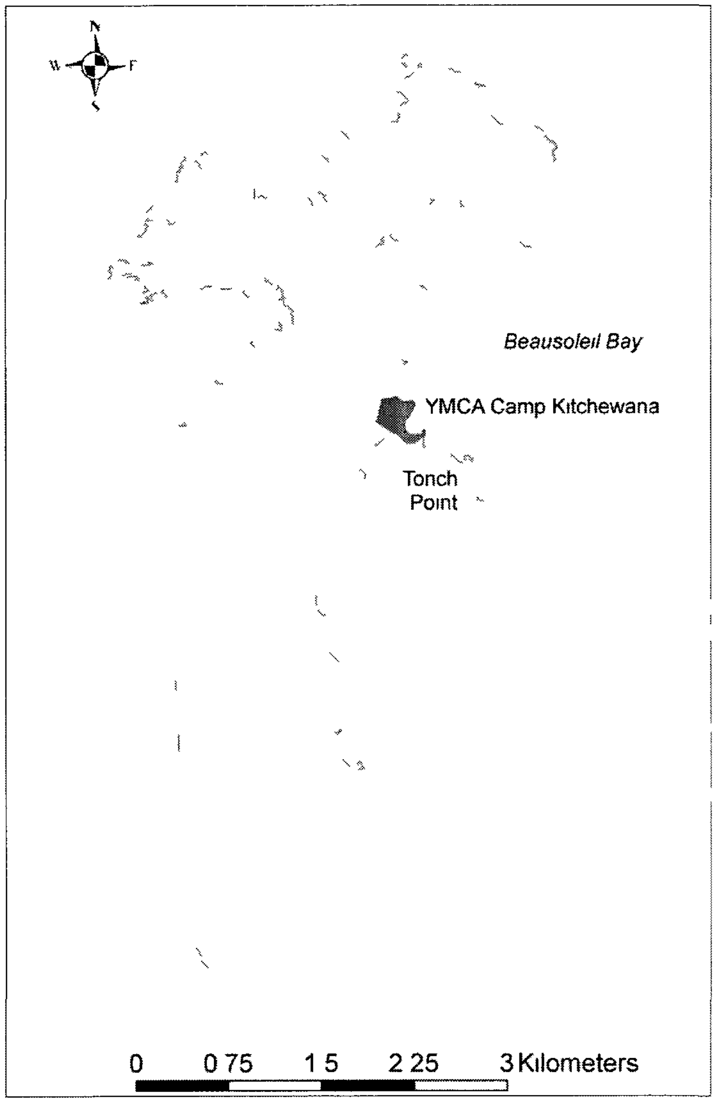


Figure 2. Beausoleil Island and Camp Kitchikewana

Middle to very early (i.e., transitional) Late Woodland occupation (circa 400 B.C. to A.D. 1000). A key component of this collection is an exceptional native pottery assemblage of approximately 135 vessels.

I elected to study the pottery collection from Camp Kithikewana primarily as a personal learning opportunity. My employment with Parks Canada and ongoing participation in the Kitchikewana archaeological investigations from 2000 to present has exposed me to the diversity of this site and its' material culture. I wanted to work with Parks Canada's existing collections, and this assemblage had not been formally analysed. Camp Kitchikewana was also one of my first exposures to Ontario's Indigenous history. This site sparked my interest in Ontario's Middle Woodland period, in particular the vague relationship between the Saugeen and Point Peninsula traditions. Beausoleil Island, being near the often cited boundary of these Middle Woodland ceramic traditions (Saugeen to the southwest and Point Peninsula to the southeast) represented an opportunity to further explore their associations. Thus I viewed this thesis as an opportunity to add to my knowledge of Ontario's precontact history, to complete a portion of a much needed site analysis, and hopefully to add to the archaeological knowledge of the southern Georgian Bay area.

First and foremost I must acknowledge that, while criticizing previous taxonomic cultural historical models based on mainly pottery, this analysis is solely focused on pottery. However, this is not hypocritical and justification for the analysis of pottery, to the exclusion of other artifact classes, rest firstly with the nature of the archaeological record at the Camp Kitchikewana site. As is later discussed, the occupational history of the Kitchikewana site spans many millennia, and more often than not, the artifacts from these different occupants are mixed together. Relying upon temporally or supposedly culturally diagnostic artifact attributes has been the only way to reconstruct the history of the Kitchikewana site thus far. While the lithic assemblage is rather large, the number of temporally diagnostic tools (i.e., projectile points) is limited, and the vast majority of the debitage could be the result of a single occupation, or the combined refuse from all occupants. The same can be said for the faunal assemblage. As is discussed in Chapters Three and Four, pottery sherds tend to provide chronological indicators, such as changing tool use through time, and possible social group connections too, through style or technology. Therefore pottery analysis forms the base for other analyses at the site to grow on. Moreover, creating a local snapshot of the pottery continuum provides a new point of reference for other research in the region.

Secondly, given the size of the collection, over 170,000 artifacts (Informatics 2002, 2003), incorporating all artifact classes into a meaningful analysis was beyond the scope of this thesis. Lithics, faunal material, etc. all deserve their own detailed examinations, which in the future can be combined with this study to better interpret Camp Kitchikewana's past.

Initially, the objective of this thesis was to analyze the Middle to early Late Woodland portion of the Kitchikewana collection, 57 vessels, in order to "simply" draw links between this assemblage and the larger cultural traditions or archaeological manifestations of Ontario's Middle Woodland Period. Ultimately the goal was to determine if the Kitchikewana pottery assemblage is related to either the Point Peninsula or Saugeen traditions, demonstrates a blending of the traditions, represents different chronological phases in the traditions, etc. Thus four potential scenarios and conclusions regarding this initial question of affiliation were considered throughout this study:

1. The Kitchikewana assemblage is more like Point Peninsula pottery and therefore the site was likely a Point Peninsula tradition occupation.
2. The Kitchikewana assemblage is more like Saugeen pottery and therefore the site was likely a Saugeen tradition occupation.
3. There are distinct sub-sets of pottery in the assemblage that are like Saugeen pottery along with sub-sets of pottery in the assemblage like Point Peninsula pottery suggesting different occupations by people from these traditions, distinct pottery traditions in contact, but not a blending of style, technique, etc.

4. The Kitchikewana assemblage does not show strong correlations to either of the traditions.
5. The Kitchikewana assemblage shows correlations to both traditions.

However, as the analysis progressed, it became clear there were not clear correlations between the Kitchikewana assemblage and the existing pottery traditions, pointing to either of the last two conclusions. Therefore, more appropriately, this research morphed inductively into addressing a broader, yet still associated, question: *Why is there diversity in this pottery assemblage*? This question begets others that eventually return us to the original premise of this study. First, previous researchers have noted diversity in the Kitchikewana pottery assemblage (Mortimer 2006; Ross et al. 1990; Teal et al. 2009), but we must discover, comparatively and objectively, if the diversity is in fact extraordinary or common. Second, are there patterns or groups of like pottery within the diversity? And finally, to return to the original premise in a less inductive manner: What are the possible causes of the diversity and/or patterning in the assemblage?

Chapter Two examines the history of the aforementioned in-situ versus intrusive debate of Iroquoian ancestry and the history of ethnic identity in Ontario archaeology. It is here that my initial premise that pottery trait correlations would exist between the Kitchikewana site and the Middle Woodland traditions is demonstrated to be very biased by the cultural-history dominated framework in Ontario. Most importantly, in Chapter Two the justification for a shift away from culture-history to an ethnogenesis perspective, and its adoption in this analysis, is presented. Next, Ontario's general Middle Woodland to early Late Woodland setting is considered, including an overview of current Middle Woodland pottery traditions in the Northeast, the implications of the "transitional" period to the Late Woodland, and a review of the existing models of subsistence, settlement, group interaction, etc. with a critique of the culture-historical model upon which they are constructed.

In Chapter Three Beausoleil Island and the Camp Kitchikewana archaeological site are introduced with geographical/geological summaries, a brief history of archaeological investigations, and an overview of the excavation methods, findings, and radiocarbon dates. The comparative archaeological collections are also presented.

Chapter Four begins with an introduction and justification for the use of attribute analysis in pottery studies before moving on to provide details on the methods used in this study. First, the general pottery assemblage is described. The nature and technique used to generate the sample population is detailed, followed by the selection and description of variables for the attribute analysis. Attribute analysis was applied in this study for multiple purposes and the basic statistical procedure undertaken in this analysis is as follows:

1. Frequency distribution of attributes for the entire assemblage including the creation of variable combinations
2. Analysis of the diversity of the Kitchikewana assemblage
3. Cluster analyses
4. Frequency distribution of attributes and variable combinations within clusters
5. Statistical associations between cluster membership and attributes and variable combinations

Each of these steps are introduced, explained, and justified in the remainder of Chapter Four.

Chapter Five presents the results of steps 1 and 2, the frequency and diversity analyses of the Kitchikewana assemblage. As reported below, the Kitchikewana pottery studied here has an interesting mix of traits diagnostic to different cultural traditions and phases within the period.

As with most attempts to fit artifacts into existing typological constructs, even those at the broad level of tradition, the overall picture that forms is one of non-conformity; the Kitchikewana Middle to Late Woodland pottery assemblage does not clearly correspond with either Saugeen or Point Peninsula pottery. To examine the diversity for possible groups of like vessels, in Chapter Six different cluster analyses (step 3) are performed with seven different variable weightings, based upon both stylistic and technological attributes. Inclusion of both stylistic and technological attributes is based on two factors, one being the longstanding tradition of identifying woodland pottery by stylistic qualities and is therefore an attempt to maintain correlation with past studies. More recently, technical choice attributes are increasingly given weight in analyses, and may be better representative of group affiliations and thus better reflect possible social group boundaries (Chilton 1998; Jones 1997; Stark 1998; Stark et al. 2000).

The validity of each clustering solution is scrutinized against set criteria and only two solutions are found to be of interest: equally weighted variables and clustering with only tradition defining variables. The clusters from these solutions are next subjected to attribute analysis to elucidate the make-up of each resulting cluster, step 4. Statistical associations between cluster membership and variables are calculated in step 5 to test the strength of observed patterns in attribute distributions, i.e., are clusters statistically set apart by variables? That is to say, if the decorative tool is known, could the cluster membership be predicted, or vice-versa.

The relationship of each cluster, and the overall assemblage, with Saugeen and Point Peninsula tradition pottery is examined by means of attribute frequencies, in particular those noted to be of significance in differentiating the traditions. Correlations between the Kitchikewana assemblage clusters and the temporal constructs derived by Curtis (2002, 2004b) for the Rice Lake area are noted and discussed.

The results of the analysis and summary discussion are drawn together in Chapter Seven. The summative conclusion begins with the the attribute analysis supporting initial conclusion 4; there is no clear distinction or connection of the Kitchikewana assemblage to or from Saugeen or Point Peninsula pottery traditions. Furthermore, with regard to diversity in the Kitchikewana assemblage, the formal diversity analysis demonstrates that, contrary to previous opinion, the Kitchikewana assemblage is no more stylistically diverse than other assemblages of similar vintage. The cluster analysis, searching for patterns of like vessels in the assemblage, further demonstrates the lack of clear correlation to the existing traditions; however it highlights a possible chronological connection with Point Peninsula pottery from the Rice Lake area. Finally, in the search for a cause of the average diversity and chronological development similar to the Rice Lake area, the following conclusion is presented and supported. The Kitchikewana site is part of a continuum of clinal change from one area to another and demonstrates the fluidity of material culture, the lack of well enforced or maintained boundaries, and discounts the existing rigid taxonomic structures currently in place and commonly used. The similarity in pottery between the regions at similar times is contrary to formal bounded regionalization processes occurring at broad scales. Rather, an intra-site or intra-group scale, pottery typologies might be present, but at a regional or pan-regional scale the similarities outweigh the differences. For the most nuanced perspective, I propose local intra-site trends and patterns are given priority, harkening back to Taylor's (1967) call for conjunctive archaeology, yet following a more modern ethnogenesis perspective (Moore 1994), and less direct historical/culture-historical perspective, as developed in Chapter Three. We should move away from ethnic or ethnolinguistic boundaries and groups and focus on tangible time-space data.

For consistency with existing literature and to provide a frame of reference, the existing temporal taxonomic categories (i.e., Middle Woodland, Late Woodland) are used, however it is with misgivings and when they are included it is as heuristic chronological devices. Significantly, increasing temporal overlaps between the Middle and Late Woodland periods have been noted throughout the northeast (Hart and Brumbach 2005; Smith 1997) and well defined changes from one period to another, such as that of Curtis and the culture-historical model, are in need of review. Furthermore, even within the periods, as Ferris (1999:3) notes for the Late Woodland period, the categorizations fail to acknowledge a "consistency of change" occurring over millennia.

With this caveat, the time span used for the Middle Woodland, 400 B.C. to A.D. 1000 begins with Smith's (1997) inception date, and ends with that proposed by Curtis (2004b). For the Late Woodland, I use Curtis' inception date of A.D. 900 (2004b:4). The end of the Late Woodland in this region is not simply placed at the 1650 dispersal of the Iroquois used in southern Ontario (Ellis and Ferris 1990; Ferris and Spence 1995). Firstly, as reviewed in Chapter Three, there is little evidence of an identifiable Huron use of the site (Mortimer 2006; Ross and D'Annibale 1994). Secondly, historic accounts of the southern Georgian Bay indigenous populations from the late 1700s and into the 1830s (noting their assimilation oriented biases) record them as being unsettled, unable to find a fixed place of residence, and note the difficulty of assimilating the non-agricultural population, i.e., they are following a more traditional way of life (Great Britain 1834:27; Miller 2000:129; Yaworsky 1976:Appendix B, 1840 Letter from S.P. Jarvis to unknown recipient). Currently, it appears that the most significant shift in settlement and subsistence and a transition into the historic era begins when the Chippewas of Lakes Huron and Simcoe sign Treaty 5, in 1798, transferring lands to the British for the construction of a naval depot on the Penetanguishene Peninsula (Canada 1891:15-17). Therefore 1800 will serve as the date for the change from the Late Woodland to Historic period in this analysis.

CHAPTER 2: ETHNICITY AND CULTURE-HISTORY TO ETHNOGENSIS

Archaeology in the Northeast has for some time focused on generating links between contemporary Iroquoian and Algonquian peoples and archaeological cultures. Archaeologists are often asked in the public realm if the sites they excavate and the material culture associated with these occupations are related to modern notions of tribes such as Petun, Neutral, Ojibway, etc. or ethnolinguistic groups such as Algonquian and Iroquoian. Aboriginal groups ask similar questions and have come to want the nice, neat answers proffered by culture-historical constructs. As Brumann (1999:S11) aptly states, "If anthropologists like it or not, it appears that people – and not only those with power – *want* culture, and they then want it precisely in the bounded, reified, essentialized and timeless fashion that most of us do now reject".

To begin examining Ontario's archaeological constructs, the ongoing debate of in-situ versus intrusive origins for historically documented Iroquoian populations is examined to provide context for the fixation on ethnicity and ethnolinguistic communities in the past, and to begin illuminating the flaws in the model and the theory they are constructed upon. Due to this focus on ethnolinguistic groups (i.e., Algonquian and Iroquoian), the concept of ethnic identity is briefly explored and its archaeological survivability/recoverability denied. This leads to the conclusion that the existing culture-history framework is flawed, and archaeology in Ontario is in need of a new theory and method, presented here as a "grass-roots" (i.e., focused on the local context) ethnogenesis (e.g., Moore 1994) perspective.

The origins and development of the Middle and Late Woodland culture-historic taxa of Point Peninsula and Saugeen are next examined, along with their immediate followers, in a manner consistent with the original premise of this thesis, i.e., connecting pottery to these constructs. Accordingly, the characteristics of the relevant pottery traditions are briefly examined here followed by descriptions of their origins, regional and temporal variation. Settlement and subsistence patterns are also outlined. It is through this process that similarities between the Saugeen and Point Peninsula entities are noted, and their deconstruction is introduced.

Archaeology and Ethnicity

Firstly, what is meant by 'ethnicity' or 'identity' and 'social group'? Defining ethnicity is important as it is the root of Iroquoian and Algonquian identities. It must be noted that these are now more appropriately termed ethnolinguistic groups, acknowledging the linguistic bias to their ethnic definitions. Ethnicity has been, for some time, a very difficult concept to define; it has been used in many different ways and subsequently summarized repeatedly with constant redefinition (Banks 1996; see for example Cohen 1974; Cohen 1978; Levine 1999). Socio-cultural anthropology's approaches alone have been various and not necessarily obvious (Banks 1996). There have been three main notions of ethnicity: primordial, instrumental, and combinations of the two. Primordial, the first widely used definition, ethnicity places descent at the centre of ethnic identity, and group membership is defined via cultural attributes *ascribed* at birth such as language; names; history and origin; religion, and value system that are maintained by "deep seated, irrational, atavistic allegiances incapable of being altered" (McKay 1982:396).

Archaeological application of primordial ethnicity tainted or prevented ethnically based archaeological studies for many years. In particular, ethnicity studies in archaeology have been disparaged in terms of nationalistic archaeologies akin to that of

Kossinna in the early 1900s, whose work was used by Nazi Germany to justify the Aryan race's superiority (Jones 1997:2-3; Trigger 1989:165). However, it is primordial ethnicity that Ontario's culture history and the direct historic approach imply when ancient artifacts are said to the Iroquoian or Algonquian. Notably, this is a view of ethnicity long since abandoned in anthropology in favour of instrumental or other definitions of ethnicity.

In 1969, the anthropologist Frederic Barth edited and published the influential volume *Ethnic Groups and Boundaries.* For Barth, ethnic identity is instrumental, constructed and defined at the boundaries when one 'actor' can distinguish themselves at some level as being different from another, and is not based upon "the cultural stuff it encloses" (Barth 1969:15). Boundary definition involves a suite of similarities or differences in behaviours, social systems, politics, material culture, etc. It is of utmost importance to acknowledge the contextual nature of these boundaries that can be rigid, permeable, or nearly non-existent. As Barth (1969:14) states of defining ethnic categories, it is "not the sum of 'objective' differences, but only those which the actors themselves regard as significant." While some differences may have a higher priority than others in defining and maintaining boundaries, other perceptible differences may be insignificant to the actors involved, and in fact may change though time and location. Furthermore, the ethnic group identity assumed by a person is not absolute and can change as well (Barth 1969:14, 26). Ethnic (i.e., identity) boundaries can only exist in a dichotomy, and then only persist if there is a marked difference in behaviour.

In 'Barthian' ethnicity, identity is found through contrasts; determination of group membership is based on relations to other groups (e.g., I am ethnicity X because I see myself, or am seen, in contrast to ethnicity Y). As opposed to primordial ethnicity, Barth places emphasis on the boundaries of ethnicity and sees the cultural markers of ethnic differences (such things as material culture, food, language, religion, or custom) as less important than how the boundaries between ethnic groups were created and are maintained in spite of the movement of goods, ideas, and even people across them (Barth 1969). By focusing on the boundaries, Barth emphasizes the situational side of ethnicity, although he tends to be primordial because he sees ethnicity as permanent "constraints on a person's behaviour which sprang from his ethnic identity" (Barth 1969:17).

Ethnicity of Barthian style was formally brought into archaeology and material culture studies by the postprocessual movement, most notably by Ian Hodder, whose work is very reflective of Barth's ethnic groups theories (Gosden 1999:194) although he seems to have avoided direct reference to ethnicity. Hodder views material culture as playing a role in the creation and maintenance of various social and ethnic boundaries and groups. This is explored by Hodder (1983), for example, though analysis of modern punk material culture, but builds on the broader concepts of boundaries. So while material culture plays a role in boundary definitions and maintenance, it is particularistic and relativistic, only taking form epiphenomenally. This epiphenomenal aspect of ethnic identity in material culture does not seem to have been acknowledged in the archaeology of Ontario until recently (Martin 2008:455-456).

Archaeology tends to run with "Barthian" ethnicity, possibly because his concept of ethnicity relied heavily upon the notion of continuing and stable boundaries. However, these stable boundaries were soon realized to be non-existent (Cohen 1978).

Furthermore, Barthian ethnicity never provides explanations for how ethnic groups came to be and thus his studies provide their best information where the boundaries are already "known" and can thus be analyzed (Levine 1999:167). In fact, clearly maintained and delineated boundaries in Ontario pre A.D. 1000 are dismissed in more recent analyses of material culture (Martin 2008; Moore 1994), which will be discussed in detail below.

Finally, recent archaeological discourse on ethnicity challenges the validity of self-defined and situational ethnicity, placing it into a continuum of identities, both of the individual and the community, defined though relationships (Lucy 2005). Thus an individual has different identities relating to age, status, gender, etc. These identities, both individually and as a group, are aspects of relationships that require constant maintenance. Maintenance of the relationship creates small changes resulting in slow transformations (Lucy 2005:2086).

Definitions of what ethnicity is vary, yet there are commonalities that are generally accepted. Ethnicity is first and foremost relationally defined. Ethnicity is created and manipulated by both context and situation (primordial and instrumental). While it may relate to culture, it is not dictated by such.

The definition of ethnicity accepted here is a compilation of the aforementioned works (primarily Jones 1997; Lucy 2005). Ethnicity is a component of an individual's communal identity, incorporating notions of shared origin or shared cultural differentiation contrasted with others. Individuals have various identities (e.g., ethnic, gender, age) expressed in different ways, at different times, in differing social interactions. An ethnic group is thus a collection of people that share commonalities in their individual identities that they, and/or others, perceive as differentiating the groups in a specific situation, time, or place. The broader communal identity (or social group) is a larger grouping of multiple shared systems of individual identity, however as with the individual components (e.g., ethnic identity), communal or social group identity in heterogeneous. My perception, and that used in this analysis, is that of a network of multiple overlapping spheres of identity at different scales of observation. Scales of observation begin expanding from individual identities (my ethnicity, or my gender), to group identities (the ethnic or gender group), to social group identities (broader collection of shared systems of ethnicity, gender, etc. and those groups roles). The boundaries at all levels are dichotomized, judged situationally in contrast to some sense of otherness, therefore creating an interacting web of identities.

Accepting this definition of ethnicity, or almost any from the last few decades of anthropological theory, places the recovery of ethnic identity beyond the reach of archaeologists. Ethnicity is so situational and dichotomized that in the cacophony of background noise from other identities, chronological changes, etc., any interpretation of the appearance of ethnic identity in material culture patterning is highly subjective and speculative. Recent historicized archaeological studies are indeed finding that historically documented ethnic groups do not appear archaeologically; in particular expected patterning in material culture is not evident.

Archaeological groups of ceramics, definable at a local scale, are often equated with ethnolinguistic groups based upon typological similarities in style/decoration, however the traits or prosaic artifacts held locally significant by the archaeologist often, as Jamieson (1999:184-185) accounts, have pan-regional distributions. Ceramic typologies based largely on decoration are useful for chronological ordering, but can quickly become the goal of seriation (Chilton 1998:132). Being 'typed' often implies affiliation of the ceramic to an archaeological group. Without constant attention, very quickly pots become direct reflectors of past cultural entities, typically linked in some fashion to ethnolinguistic groups. However, "archaeologists cannot make their sherds utter words" (Lamberg-Karlovsky 2002:75) and just because a group has a specific type of pottery does not therefore imply an ethnic identity. Chilton argues that through attribute based analysis, particularly of technological choice, a more representative picture past social boundaries (i.e., ethnic groups), can be deciphered (Chilton 1998). Technological choice represents another avenue of material culture research, not apart from style and function, but incorporating these into the analysis of choice process that often subconsciously occurs during the creation of an object (Chilton 1998).

Chilton (1998) provides a good example of the applicability of technological choice in attempting to delineate Algonquian and Iroquoian ceramics in southern New England. Interestingly enough, what she demonstrates is that even with *multiple lines of evidence* (ethnographic accounts, historic documents, multiple sites, etc.) the historically documented social boundaries are not found in the ceramic assemblages. While the boundaries were apparent to European colonists and ethnographers, they do not materialize archaeologically and in fact this may represent an intentional manipulation of material culture to spite the imposition of social boundaries by Europeans upon the indigenous groups. In Chilton's study social boundaries are intentionally manipulated, not in an attempt to strengthen boundaries within the larger indigenous cultural group, but rather to eliminate the material culture patterns that could evidence documented social patterns. Detailed interpretation such as this relies heavily upon historicized knowledge, not readily available in archaeological contexts.

Ethnolinguistic Ontario

The preceding discussion on the development and later drawback of ethnic identity in archaeology is of consequence in this context as the archaeology of Ontario has for some time been concerned with the development of the historically documented ethnolinguistic Northern Iroquoian groups of Southern Ontario (Erie, Huron, Neutral, and Petun). Often Iroquoian origins are contrasted with neighbouring groups of Algonquians (Ojibway/Chippewa, Odawa, Potawatomi, and Cree) (Latta 1999:18; e.g., Trigger 1970; Wintemberg 1917, 1931, 1935). This debate is not limited to Ontario, rather it encompasses the Northeast. It stems from a perceived dichotomy between the two ethnolingusitic communities noted by European explorers and in ethnohistorical accounts (e.g., Heidenreich 1971; Trigger 1976; Trigger 1970), whereby these groups are often contrasted as being *either* Iroquoian maize agriculturalists, *or* Algonquian hunters and gatherers.

The origin of Northern Iroquoians has been an ongoing debate between an in-situ development versus an intrusive event. Some version of the in-situ model has held sway for the last sixty years (Snow 1995:60, Martin 2008). More recently, with chronologically refined, historicized, and analytical studies, both explanations are found to be flawed. Reconsideration of settlement and subsistence continuities and the coexistence of transitional taxa with "static" ones (e.g., Point Peninsula and Owasco or Princess Point overlapping in time), has begun the deconstruction of such simplistic in-situ, dendritic taxonomic models (see Hart and Brumbach 2003, 2005, 2009; Jamieson

1999; Martin 2008; Smith 1997). As such, alternate perspectives, such as ethnogenesis, are being explored in resolving Iroquoian origins in the Northeast (e.g., Hart and Brumbach 2009).

The debate is of relevance to this study as it recounts attempts to assign ethnolinguistic affiliations of the people participating in Middle and Late Woodland pottery traditions. Furthermore, the Kitchikewana site occupations span the time period contested in the debate, thus contributing to the body of evidence in this region of Ontario. For example, some pottery from the Kitchikewana site has been assigned to Wright's (1966) Early Late Woodland Iroquoian Phases (e.g., Ross et al. 1990), involuntarily affiliating the site with an Iroquoian ethnolinguistic identity. Conversely, Teal et al. (2009:33) postulate Odawa (Algonquian) connections to the Beausoleil Island and Fox and Garrad (2004:121) state the Algonquians "occupied this area for millennia." Furthermore, the current and historic ethnolinguistic affiliations to Beausoleil Island lie with Anishinaabe (Algonquian) communities (e.g., Beausoleil First Nation, Chippewas of Rama First Nation, Chippewas of Georgina Island First Nation, Moose Deer Point First Nation, and Wasauksing First Nation). These communities, in particular Beausoleil First Nation, maintain strong oral traditions of the area as their home for thousands of years. Resolution of the Iroquoian origin debate is highly political, as it impacts current and future populations in terms of land-claim settlements, designations of traditional use areas, "ownership" of cultural property, and the assignation of cultural affiliations to human remains (Martin 2008:454). Thus, the history of the debate is briefly outlined.

The in-situ theory considers that the historically present groups of Iroquoians, both along the north shore of Lake Ontario and in New York State, developed locally from shared common ancestry. The implication is a deep time continuum for Iroquoian ancestry in the region. This model pushes Algonquian ancestry out of Central New York and Southern Ontario. Griffin (1944) was one of the first suggest in-situ Iroquoian development based upon linking Iroquoians to the Hopewell complex. This general development sequence was adopted by MacNeish (1952) and later Ritchie (1965:272), who came to perceive that the New York Iroquoian groups (Mohawk, Oneida, Onondaga, Cayuga, Senaca, and Tuscarora), though a multistage process, developed locally from an Owasco base. This Owasco base in turn came from Point Peninsula developments (Ritchie 1965:230). This contrasts earlier models placing Owasco in an Algonquian sequence (Ritchie 1944), or an Algonquian-Iroquoian hybrid (Martin 2008:447; Ritchie and MacNeish 1949:122).

In Ontario, Wright's (1966) Late Woodland Iroquoian developmental stages have dominated, and often confounded, subsequent interpretations (MacDonald and Williamson 1995:10). At the time, Wright (1966:94) found the evidence too limited to connect his Late Woodland Iroquoian development to preceding Middle Woodland occupations. Wright eventually did make the in-situ link, thus placing the 17th century Huron, Petun, Neutral, and Erie into direct descent lineages from the Middle Woodland or even the Archaic Period (Wright 1984; 2004:1308). This solidified Iroquoian in-situ development and long-term ethnicity in the region. Late Woodland Ontario Iroquoians, under the in-situ model developed regionally, whereby west of Toronto their predecessor was Princess Point (Crawford and Smith 1996; Fox 1990; Smith and

Crawford 1997). In Central Ontario, Iroquoian lineage is tied to Sandbanks groups (Curtis 2004b; Wright and Daechsel 1993), while further east the St. Lawrence Iroquois evolve locally from the Melocheville tradition (Gates St-Pierre 2001a; Wright 1999b:618). These divergent traditions emerged sometime between A.D. 500 and 1000, depending upon the location and researcher, from the Point Peninsula tradition of the Middle Woodland period (Curtis 2004b; Fox 1990). However, some continue the lineage of Iroquoian ancestry in the region back to 4000 B.C. (Wright 1999b:618).

Evidence for the in-situ theory is often found through a direct historic approach to culture history that finds continuity in material culture, settlement, and subsistence patterns (Martin 2008:448). However, the connections are based mostly on temporal continuities in pottery trait development (e.g., MacNeish 1952; Ritchie and MacNeish 1949). As will be discussed later, this reliance on pottery as indicative of past ethnolinguistic identity is folly.

Intrusive, or migration, models hypothesize that the historical Iroquoian groups, both in New York State and Ontario, are relatively recent insertions into a previously non-Iroquoian territory. The simplistic implication being that the region is likely one of Algonquian ancestry. Intrusive theories appear as early as 1851, when anthropologist Lewis Morgan speculated that the Iroquois moved into central New York from the north shore of the St. Lawrence River near Montreal "where they lived in subjection to the Adirondacks, a branch of the Algonkin race"(Morgan 1922:4-6 [1851]). Morgan's intrusive hypothesis, may derive from the perceived discontinuities between the ancient "mound builders" and Iroquoians, as Morgan notes in 1850 (State University of New York at Albany 1850). Intrusive models really gained popularity with the work of

Parker (1916:503-506; 1922:155-158), who postulated a southern origin of the Iroquois, near the mouth of the Ohio River, and that the region was previously occupied by others. Parker's theory was applied by Ritchie (1944:10 [Plate 4], 27), who places the archaeological constructs of Point Peninsula and Owasco into an Algonquian sequence, thus making them ancestral to Algonquian groups in the Northeast, and thus the Iroquoians were intrusive.

More recently, Snow (1995) has argued for migrations into New York State and Ontario from the south, e.g., Clemson's Island in Pennsylvania. These immigrants brought incipient "Iroquoian" traits including maize horticulture, compact villages, and their associated material culture. Snow (1995) argues that the intrusive culture manifests archaeologically as discontinuities in the archaeological record circa A.D. 900/1000. In New York he suggest this is Owasco, and in Ontario as Glen Meyer (Smith 1995). However, Crawford and Smith (1996), in support of the in-situ theory, note there are incongruities in the appearance of the traits Snow holds as evidence and many pre-date the A.D. 900/1000 horizon. Furthermore, as Smith and Crawford (1995) document, there are considerable links between Princess Point the later Glen Meyer of Wright's (1966) Early Iroquoian Phase, discounting Snow's (1995) perception of a discontinuity at that time. Snow (1996) address these inconsistencies, by placing the migration earlier to become the origin of the Princess Point Complex. Just how the Melocheville and Sandbanks traditions fit into this theory is unclear, likely because their creation as archaeological taxa is more recent, or as discussed below, the theory in general is insufficient.

Northeastern Ethnogenesis

While intrusive theories have not gained much following in Ontario archaeology, newer analyses are shedding light on flaws in the in-situ model. This does not necessarily validate intrusive theories, rather it opens the debate to newer, ethnogenesis informed perspectives.

Recent studies of mitochondrial DNA demonstrate that both population movement and stability are accessible, though further analysis is still required (Malhi et al. 2001). Of particular interest here are comparisons of mitochondrial DNA haplogroups from extant Indigenous populations to those of archaeologically recovered human remains. Studies in the Northeast have demonstrated a genetic continuity from some current Algonquian-speaking people back to ancestors in the area circa 1000 B.C. (Schultz Shook and Smith 2008:27). At this time Seibert (1967) defines the area north of Lake Ontario (between Lake Ontario and Georgian Bay) to be the linguistic homeland of Proto-Algonquian language. This proto language then split and expanded from circa. 400 B.C. to A.D. 500, via cultural and/or demic, diffusion, into the historically known Eastern and Central Algonquian languages (Fiedel 1987, 1990, 1999). This concept of a Southern Ontario Algonquian homeland is effectively ignored under the in-situ Iroquoian development theory.

There is also genetic evidence of significant gene flow across the Northeast throughout the past, with ancient Northeastern populations having many similar genetic expressions (Schultz Shook and Smith 2008:24), suggesting a lack of well-defined boundaries in marriage or procreation between social groups. Furthermore, haplogroup discontinuities between modern Iroquoian-speaking and other Northeastern groups may be evidence of a more recent "cultural intrusion into the Northeast by the Iroquoians" circa A.D. 700 (Malhi et al. 2001:42).

Hart and Brumbach (2003, 2005, 2009), take the alternating evidence for and against both theories as a sign that massive revision is necessary, not just to the use of Owasco or to transitional periods between the Middle and Late Woodland, as called for by Smith (1997:61-63), but to the entire taxonomy of New York archaeology. Martin (2008:455) points out that both in-situ and intrusion theories have the goal of "linking materials to nameable ethnolingiuistic communities." This goal, as discussed below, is folly. I argue that the same revisions should be in effect in Ontario. As I present later, Ontario's Middle Woodland taxonomic entities are flawed as well. Furthermore, Princess Point and Sandbanks, originally transitional taxa encasing the inceptions of horticulture and the dawning of the Late Woodland (Crawford and Smith 1996; Smith and Crawford 1997; Wright and Daechsel 1993), are now perhaps extensions of the Middle Woodland or coexist with Middle Woodland habitations (Curtis 2004b; Smith 1997). The coexistence highlights continuity of change in the region across geography and time (Ferris 1999), and requires detailed chronologically, ie., hisotorically, sensitive analysis of the different traits. As Martin (2008:455) aptly summarizes:

> ...the broad spread of so many material traits throughout the Lower Great lakes region implies that clearly enforced boundaries between local communities and, indeed, between different speech communities were rare, short-lived, or nonexistent, particularly across the first millennium A.D.

Further critique of the cultural-historical taxonomy prevalent in Ontario comes from an examination of the cladistic theory behind the model (Moore 1994). Cladistic theories are those based upon a branching tree model where a parent spawns daughter groups. It is derived largely from biological studies of evolution. Its use in archaeology is ingrained into the cultural-historical reconstructions of populations splitting to form new groups with ever increasing number of groups from a parent. Moore (1994:928) aptly demonstrates that the use of cladistic theory in archaeology is fundamentally flawed, primarily through its implicit assumptions that ancestral societies truly existed in the past, not just as archaeological cultures. Furthermore, in biological applications of cladistic theory the progression of species being "mapped" in the cladogram, once divided never to remerge to "incorporate any genetic material from its sisters" (Moore 1994:928). Replacing species in the model with humans, a lone species, in the cultural application of this theory is necessarily flawed because genetic, cultural, and linguistic materials are known to be shared between populations. Moore (1994:928) even notes that frequency seriation, one of the backbones of cultural-historical reconstructions, is also flawed owing to assumptions of unidirectional development and of not sharing technologies between populations.

If the bounded units archaeologists have created (e.g., Owasco, Princess Point) are flawed in light of new evidence (e.g., Hart and Brumbach 2003, 2005, 2009), and the underlying premises of the cultural-historical framework are fundamentally flawed (Moore 1994), perhaps our underlying concepts of social group boundaries, in particular past ethnolinguitic groups, formulated in a boxed cultural historical paradigm through the direct historical approach, are inefficient at capturing the archaeological evidence of the complexity of past human relationships. Past diversity is lost in the archaeological interpretations of Ontario that are based largely on misguided or outdated views of the importance of material culture traits in defining social groups, that are then boxed in obsolete and flawed culture-historical models that blindly infer to ethnicity or identity from current ethnolinguistic groups into the distant past. To better comprehend past diversity, archaeology must begin at a "grass roots" level and attempt to understand local contexts on their own merit, not referentially. This is best done through synthetic intrasite analysis, that allows "a scalar, material-based perspective for the local contexts of change" (Martin 2008:456) applied in an ethnogenesis perpective (Moore 1994).

As Martin (2008) summarizes, the past geographic areas of ethnolinguistic groups were once archaeologically identified via collections of similar material culture. However these collections of like traits are not lasting, and as stated above the use of any traits in boundary definitions would be relativistic and epiphenomenal, thus rather than corresponding to ethnolinguistic boundaries, material culture complexes vary beyond ethnolinguistic ones (Martin 2008:456) and the boxes of "like" material culture are, for the most part, archaeological constructs and not much more. This has been recently demonstrated by Hart (2011), who finds though a multi-site analysis of similarities in collar style, that the common linking of "Iroquoian" collar designs to specific ethnic territories is not viable. Furthermore, the applicability of the rhizotic model in the development of Northern Iroquoians is also well demonstrated by Hart and Englebrecht (2011) who document the fluidity of collar designs though social network analysis, discounting cladistic models.

I believe that the nature of the social groups at the time plays an important role in creating this rhizotic diversity. First and foremost we must recognize as Hart and Brumbach (2009:368) state "that the archaeological record reflects the activities of local human populations comprising *kin groups* at various level of integration," (emphasis added) and as Jamieson (1999:183) notes, groups from the period at hand were "characterized by openness and flexibility". Secondly, the choices made in pottery production are not determined by the community, but rather through individual decisions within that community. The greater the number of individuals making choices, the greater the variability becomes. Social learning studies, such as that by Shennan and Steele (1999), also demonstrate that the teachers of specialized craft production, such as pottery, are parents of the same gender. Thus, at a local scale in a dispersed population, such as that of hunter and gatherers in the Middle Woodland period, as Hart and Brumbach (2009:368) state, there are "as many teachers as there are nucleated family groups," introducing a great deal of local variability.

Conversely, across the Northeast, as evidenced by Funk (1983), and from Point Peninsula to Saugeen pottery (Finlayson 1977; Spence et al. 1990), attributes are shared speaking to the fluidity of the larger population and a lack of social boundaries in the region at the time as argued by Martin (2008) in his analysis of ethnolinguistic groups in the Northeast, and shown though Milner and Katzenberg's (1999) review of Great Lakes skeletal analyses, Hart and Brumach's (2009) analysis of New York State pottery transitions, and mtDNA studies of current and past indigenous communities (Malhi et al. 2001; Schultz Shook and Smith 2008).

I argue from my analysis of published literature (Appendix C: Defining Middle Woodland Pottery Traditions) that a ceramic based taxonomic division of Saugeen and Point Peninsula is at best an archaeological construct of moderately differing forms of pottery visible at a local scale. However, within a pan-regional continuum, the differences are possibly more linked to geographical distances, temporal differences, or differences in kin group based pottery decisions not reflective of differences in processes of social systems at large. Given that their similarities outweigh their differences, I believe the division of Saugeen and Point Peninsula as viable contrasting constructs needs further assessment using more Saugeen pottery assemblages than those used here, and examinations beyond pottery starting from a local, ethnogenesis and rhizotic informed perspective.

Moore's (1994) ethnogenesis model presents a viable alternative to the flawed cultural-historical boxes which do not truly exist but are solely a product of the archaeological process. As Shennan (1989:11) states of the conflation of archaeological cultures to true groups in the past, they former are "summary descriptions of spatial variation, not merely useless for analytical purposes, but positively misleading if taken as the basis of an approach to prehistory".

I find the existing culture history framework is thus flawed. I argue this based also on Moore's (1994) critiques of both cladisitc formulations and the direct historic approach. I also critique the use of outdated concepts of ethnic identity in the past, e.g., unknown persistence of identity, lack of boundaries etc., which tie in with the flaws in identifying Saugeen and Point Peninsula as well as transitional taxa such as Sandbanks-Princess Point-Melocheville etc. The relevance of this debate in the first place is tied to the linking either Algonquian or Iroquoian historic groups erroneously to the taxonomic boxes in existing models of the past.

I also suggest the temporal boxes are flawed when applied at a local level in terms of the baggage they analogously associate with transitional Late Woodland dates (such that there is no evidence at the Kitchikewana site up to A.D. 1200 of significant shifts in settlement or subsistence), the overlap of "transitional" taxa with 'static' ones, and the implied silo development model that ends up ignoring the fluidity of people/genes/ethnicity etc. throughout time, and the divergent trajectories of the various traits of social groups through time and space.

I say we can't box the past nor do we even need to if we start from local contexts and avoid falling into easy, blindly accepted, analogies from flawed temporal or archaeological culture constructs, as demonstrated though this analysis. On the other hand, we cannot ignore broader regional and pan-regional processes, but the analysis of such processes, as Jamieson (1999:190) notes, cannot be accommodated in the current taxonomy.

I do not believe, as Wright (1999a:289) suggests, deconstructing the current taxonomy is tantamount throwing the baby out with the bathwater. Our model has served well when little of an archaeological era is known, and for creating basic time space grids, but the eventually application of the model to real culture necessitates a change. For an interpretive model I propose, based on similar models presented New York Sate (Englebrecht 2003; Hart 2011; Hart and Brumbach 2003, 2005, 2009; Hart and Englebrecht 2011; Martin 2008; Moore 1994; also see Voss 2008), that we accept the perspective of ethnogenesis and a rhizotic rather than dendritic model. This perspective, emphasizes that any social group can be derived from several different parent groups and can be qualitatively different than the parent groups, i.e., they are not simple combinations. To reiterate, ethnogenesis and rhizotic models hold that language, culture, material culture, genetics, biology and more, all vary independently, on different scales, and at different rates. Thus identity, be it ethnic, linguistic, gender, age, etc., is in constant flux and is reformed and redefined continually though different means, with boundaries being relationally defined epiphenomenally, thus arguing against rigid temporal taxonomic boxes and cultural stability.

An ethnogenetesis perspective allows for the finding of ethnically diverse groups bearing "multilingualism [and] intermarriage across supposedly profound ethnic boundaries, and enormous cultural variation" (Moore 2004:936), rather than requiring monolithic homogenous groups. Ethnogenesis, in contrast to the aforementioned cladistic theory, is based upon rhizotic theory. Rhizotic theory permits several antecedent groups to be the origin of descendent and hybrid groups (Moore 1994:925, 938). Diagrams of rhizotic processes are more riverine in appearance (see Moore 1994 Figure 4), allowing divergent branches to reconnect. Thus ethnogenetic models are based upon the interconnectedness and mixed nature of human populations. They expect "...that human history has always been characterized by interaction across profound ethnic and cultural boundaries, by the amalgamation of linguistic traits, and by the recurrent hybridization of cultures" (Moore 1994:937). The nodes or connections between groups are hybridized versions, amalgams of two or more groups that may or may not incorporate recognizable characteristics of the parent groups. Moore (1994) uses a metallurgical analogy for this hybridization whereby tin and copper do not share their properties when mixed into bronze, but are rather something entirely new. Accordingly, "ethnogeneticists do not consider fuzzy ethnic and tribal boundaries to be unusual, but rather find them entirely predictable in light of the patterns of process and change recorded by ethnographers and ethnohistorians" (Moore 1994:938). An ethnogenesis perspective allows for the different emergent lines of evidence that now demonstrate the flaws of in-situ and intrusive models (Hart and Brumbach 2009), and the pan-regional Middle Woodland manifestations addressed next.

Point Peninsula

Grossly simplified, Point Peninsula has been characterized as a hunter-gatherer society, defined by seasonal encampments and ceramic vessels. Point Peninsula has been identified across a wide geographic region. In the west of Southern Ontario it first appears along the Grand River with a boundary up to the southernmost tip of Georgian Bay. It extends north to the French and Mattawa rivers, east into southern Quebec, possibly to the Gaspe Bay, and Vermont, and is found throughout New York State (Spence et al. 1990).

The definition of Point Peninsula has gone through many revisions since first characterized by William Ritchie in 1944. As demonstrated in the following paragraphs, Point Peninsula has been seen as a focus, a culture, a complex, or a tradition at various times and by various people. One of the few relative constants throughout has been the key identifier of Point Peninsula, its pottery (Curtis 2004b:25). The following few pages examine these changes in an attempt to generate a better concept of the meaning of Point Peninsula in Ontario, its development as an archaeological device, and in the process to highlight the defining characteristics of Point Peninsula. Today, Point Peninsula is generally referred to as a complex or tradition of the Middle Woodland period commencing circa 400 B.C. (Curtis 2004b:21). The termination date of Point Peninsula, and the Middle Woodland period in general, is under debate. Curtis (2004b) places Point Peninsula into a gradual change though to Wright`s (1966) Early Ontario Iroquois with an end date circa A.D. 1000. Others, notably Ferris and Spence

(1995:104) envision a transitional period circa A.D. 600 to 900. Smith (1997) also notes the overlap, but argues taxonomically against a "Transitional" period as it is not in keeping with the Northeastern taxonomy. Smith (1997) rather proposes a different *Stage* and P*hase* free model with overlap between Point Peninsula and the succeeding Princess Point. Hart and Brumbach (2003, 2005, 2009) also find significant discrepancy in New York State's chronology for the end of Point Peninsula and the beginning of a successive phase. Rather than attempt to fit it into a modification of the taxonomy as proposed by Smith (1997), Hart and Brumbach (2003, 2005, 2009) demonstrate that the taxonomy is indeed fundamentally flawed. The concept of a monolithic static entity, i.e., Point Peninsula, definable by specific traits through time has proven to be incorrect because, as previously stated, groups are never static and are always in the process of becoming.

Shifting Terminology

Classification of the phenomenon known as "Point Peninsula" has undergone constant development. When Ritchie (1944) formally identified Point Peninsula as a *Focus* of the Vine Valley *Aspect* of the Woodland *Pattern*, he was following the Midwestern Taxonomic Method (McKern 1939), and created this focus from a small sample of 14 sites in New York State and a couple in Ontario. Since McKern defines a focus as "that class of culture exhibiting characteristic peculiarities of the finest analysis of cultural detail, and may in instances correspond to the local tribe in ethnology" (1939:308), the definition of Point Peninsula as a focus at that point in history was likely justified given the limited research available. For instance, the Point Peninsula Focus was viewed as an agricultural 'degenerative' of the Hopewell (Ritchie 1944:121).

Ritchie argues against a broader classification of Point Peninsula (1944:121) yet does suggest that a dual or tripartite division of the focus, based on the presence or absence of specific artifact traits at certain components (sites or parts thereof), could be supported in the future (1944:116).

In Ritchie and MacNeish's seminal *The Pre-Iroquoian Pottery of New York State*, the definition becomes a bit less clear as they initially call it the Point Peninsula culture (1949:97) then later a horizon. Yet they maintain a hint of McKern's terminology in the description of their technique where (emphasis added) "excavated sites of the same *aspect* were selected..." (1949:98). The use of 'culture' could be based upon a presumed correspondence of an ethnological culture (or an archaeological culture's approximation of one) and an archaeological taxonomic category (the horizon), again like McKern, only lacking the inflexibility of his typology. Additionally, recognizing the great diversity of ceramics recovered from these pre-Iroquoian aspects Ritchie and MacNeish (1949) adopted Kreiger's (1944) typological concept to create 15 distinct Point Peninsula pottery types that they believed to be expressions of behavioural, temporal, and spatial variation (discussed below).

McKern's taxonomic method is readily apparent in Ritchie's 1951 summary of New York prehistory. The earlier suggestions of dividing the focus (Ritchie 1944:116) are enacted and the single Point Peninsula Focus is separated into four separate artifact, time, and space based foci, suffixed numerically 1 to 4, all of which are part of the Vine Valley Aspect (Ritchie 1951). The foci are expressed as components at the site level. Ritchie's sequencing implies each focus relates generally to a different temporal manifestation of Point Peninsula and this is based upon differing artifact styles and frequencies, most notably ceramics. Unfortunately, the exact characteristics defining the relationships between the foci are somewhat unclear as their attributes are not stated beyond noting trends and components. However, the Point Peninsula 1 Focus predates the Middle Woodland and foci 3 and 4 post-date or are not found in Ontario. Thus the Point Peninsula 2 Focus is the most relevant for this review as it is this focus which is manifested in Ontario (Wright 1967).

Further taxonomic development and archaeological research led to the eventual classification of Point Peninsula as a tradition or culture, under Willey and Phillips' (1958) tradition-horizon taxonomic scheme (Ritchie 1965). Willey and Phillips' definition of a 'tradition' is (emphasis added) "a temporal continuity represented by persistent configurations in *single technologies* or other systems of related forms" (1958:37). In *The Archaeology of New York State* (1965), Ritchie, recognizing the overriding similarities through time and space, elevates the taxonomic level of Point Peninsula to a tradition and inserts three 'phases' within it. Ritchie (1965) uses a 'phase' as the equivalent to a focus, and creates the Canoe Point, Kipp Island, and Hunter's Home phases of the Point Peninsula Tradition, while rejecting Point Peninsula 1 as a construct. Each phase exhibits a degree of artifact homogeneity and relates to a developmental phase of Point Peninsula. Further discussion of these new phases is not necessary since they do not readily transfer to, nor have they been extensively used in the study of Point Peninsula in Ontario. It is important to be cautious as the transference and application of such geographically removed constructs may lead to attempting to fit the proverbial 'square peg into a round hole' and, as discussed below, regionally developed phases are likely much more valid. Furthermore, while the phases remained in Ritchie and Funk's subsequent work, *Aboriginal Settlement Patterns in the Northeast* (1973), and the revised edition of *The Archaeology of New York State* (Ritchie 1980), theoretical flaws in such taxonomic systems and their application have been highlighted (as noted in Snow 1995; Stoltman et al. 1978; Trigger 1989:190-194). More importantly, the validity and reality of these archaeologically identified divisions have come under scrutiny and skepticism (Gates St-Pierre 2001b; Hart and Brumbach 2003, 2005; Smith 1997; Snow 1995).

As an aside, it is interesting to note the pseudo-paradigm change Ritchie attempts. His earlier highly descriptive and trait-list based work is absent in his 1965 synthesis. Here, discussion of settlement patterns, ecology, subsistence, etc. appear, and Ritchie states in the introduction that this is an attempt to improve archaeological studies by applying some of the theories put forth by Taylor (1967 [1948]) in his 'conjunctive approach' (Ritchie 1965:xv). However, as Hart and Brumbach (2003:742) aptly note, it is really just a reworking of his previous material into a narrative and is not a true shift to examining the process of culture change.

In Ontario, Spence et al. (1990), Smith (1997), Wright (1999b), and others have termed Point Peninsula a 'complex'. Curtis (2004b:25) points out, the use of 'complex' suggests Point Peninsula to be broader and more inclusive than a ceramic tradition since McKern's definition of a complex includes (emphasis added) "*all* the traits characteristic for a given culture manifestation…" (1939:305). While defining Point Peninsula as a 'complex' may seem logical, and in the future might be practical, ceramics remain as the common means to differentiate between the regional manifestations of the Middle Woodland Period in Ontario (Curtis 2004b:25, 237). While

Wright (1999b) argues correctly that lithics should be used with pottery, and further that entire assemblages should be considered, differences in other artifacts, settlement and subsistence patterns, cosmology, etc. are either too vague intrinsically, are not yet archaeologically resolved, or rather transcend regions at different scales to the point of invalidating categorizing whole cultural systems. Thus, maintaining the more general term 'tradition' better suits the current state of research and the use of ceramic based differentiations.

Saugeen

Key to the difficulty of differentiating regional taxonomic constructs in Ontario was the creation of 'Saugeen'. The Saugeen Focus of the Woodland Pattern, as it initial manifestation was taxonomically placed, was conceived during the pottery analysis of material from the Donaldson site (Wright and Anderson 1963:23). As Wright and Anderson (1963:23) state, "Although the Saugeen and Point Peninsula 2 foci ceramics possess certain attribute correspondences, it is impossible to apply the Point Peninsula ceramic typology (Ritchie and MacNeish 1949) to the Saugeen ceramics." Other artifact differences are noted, but the material culture discrepancy between the Saugeen and Point Peninsula foci is the absence of some items on the sites deemed to be of the former focus (Wright and Anderson 1963:48), a classic argument based upon the evidence of absence. Thus, the birth of the new focus was related primarily to pottery, predicated mostly on stylistic attributes, and transpired when attempting to apply a typological model created for New York state (and based largely on sites from central or eastern New York and the Point Peninsula site), to a site located at *least* 300 km away..

Four reliable radiocarbon dates were obtained from the Donaldson site, one from a midden, three from cemeteries. The midden sample (S-490) produced a calibrated calendrical date range of 990 (770) 250 B.C. (Smith 1997:Table 2), similar to the date from a pit in the cemetery at 800 (760, 690, 540) 400 B.C. (S-119) (Smith 1997:Table 2). While Wright and Anderson (1963) accept the dates, others consider them too early to be associated with a Middle Woodland period Saugeen occupation (Smith 1997:42-45; Spence et al. 1990:126), but do validate a long use history for the site. Direct sampling of one burial returned a calibrated date of A.D. 540 (650) 780 (GaK-3800) (Smith 1997:Table 2), later in the Middle Woodland, and nearer what Smith (1997:53) calculates as the end of the Saugeen tradition circa A.D. 800. The final sample (S-776), a rib bone from a burial in the second cemetery, with associated grave goods including a copper panpipe cover, cut mica sheets, a stone earspool, an antler hafted beaver incisor, etc., returned a calibrated date of 100 B.C. (A.D. 70) A.D. 240 (Smith 1997:Table 2). This is very reminiscent of recoveries from the Serpent Mounds site (Johnston 1968). The occupation range for the site, based on the radiocarbon dates, is 990 B.C. to A.D. 780. It is important to note that Wright and Anderson (1963:49) observe that "The major diagnostic feature of the Saugeen Focus is the application of early Middle Woodland decorative techniques and motifs to an Early Woodland paste" and that "the projectile points from the Saugeen Focus resemble Early Woodland varieties…" (Wright and Anderson 1963:47) or earlier types. Is it not, given the Early Woodland parallels and the early radiocarbon dates, plausible that the Saugeen Focus, as Wright and Anderson (1963) identify it at the Donaldson site, is simply a transitional Early to Middle Woodland site?

Wright and Anderson (1963:50-51), using very limited data, suggest the distribution of the Saugeen Focus encompassed the Grand River and Saugeen River drainages, stretching from Lake Huron to Lake Erie, west of London, nearly to the western end of Lake Ontario. The validity of this distribution has not been quantified to date, and there is still debate as to its extent (Spence et al. 1990:148).

The seminal work on the Saugeen, Finlayson's "The Saugeen Culture: A Middle Woodland Manifestation in Southwestern Ontario", does not help with the distribution as he focused on three known sites in the Bruce County region, Donaldson, Thede, and Inverhuron-Lucas (Finlayson 1977:12). As with development of Point Peninsula, Finlayson (1977) adopts the term "culture" to describe the taxonomic placement of Saugeen. However, Finlayson does not question or assess the validity of Wright and Anderson's creation of Saugeen as set apart from Point Peninsula.

Most relevant to the study at hand, Finlayson comes up with a list, supporting the work of Wright and Anderson, which supplies the diagnostic differences exhibited by Saugeen tradition sites. As with Wright and Anderson (1963), this list of 13 characteristics focuses on pottery (7 of the 13 criteria) (Finlayson 1977:630-631) and, as is shown later, the differences Finlayson notes are subjective and only supported in a limited way when examined objectively and statistically. Other Saugeen traits offered by Finlayson (1977:630-631) include a lower frequency of projectile points and a lack of Point Peninsula types; a poorly developed bone and stone tool kit; decreased burial variety; lack of mound burial, and limited evidence of participation in the Hopewellian sphere; the presence of cobble spall scrapers, copper fishhooks, toggling antler harpoons; the absence of barbed harpoons, platform and tubular pipes, and perforated bone needles. Furthermore, Finlayson (1977:632) believes the Saugeen had a different subsistence pattern, however this is based only on a comparison to the Rice Lake groups, which he acknowledges have limited data, and occupied a different ecological niche.

The Middle Woodland Period Traditions in Ontario

The characteristics of the relevant pottery traditions are examined briefly here, and more detail is provided though the analysis and in Appendix C: Defining Middle Woodland Pottery Traditions.

The Ontario Point Peninsula Tradition shares many similarities with its counterpart in New York State, yet there are some aspects which suggest that geographic barriers, such as the St. Lawrence River and Lake Ontario, had an effect on the continuity of this tradition (Spence et al. 1990:157). Point Peninsula tradition sites in Ontario are most commonly identified by the presence of Vinette 2 ceramics and are placed within Ritchie's Point Peninsula 2 Phase. Despite the large geographic span and regional variability of the Ontario Point Peninsula ceramics, they share many traits (Curtis 2004b:25; Ritchie 1951:134; Ritchie and MacNeish 1949:100; Spence et al. 1990:158):

- predominately grit-temper
- dentate, pseudo-scallop shell, and cord-wrap-stick stamp decoration mostly on the exterior and commonly covering the entire body
- elongate-bodied vessels with conoidal or sub-conoidal bases
- flat, rounded, or pointed lips on slightly everted (often sharply at the top) rims
- application of an ochre wash
- interior surfaces are commonly combed with a toothed tool (sometimes called channelled or striated) creating parallel striations
- exteriors are smoothed or brushed
- manufacture is in the coil method

Unfortunately, many of these traits of Point Peninsula ceramics are shared with both Saugeen and Laurel (discussed below) ceramics. Recognition of the difference between the types is often simplified by geographical distance, but when near the supposed boundary between the traditions, the task becomes more difficult. Trends are the proffered means to judge Saugeen from Point Peninsula as the latter demonstrate more interior channeling, thinner vessel walls, finer paste, a higher proportion of pointed lips, red ochre washes, and finer dentate stamping (Finlayson 1977:630-631; Spence et al. 1990:158; Wright 1967; Wright and Anderson 1963). However, as will be discussed later, these trends are not absolutes. Nonetheless, generally speaking, Saugeen pottery is held to be thicker and chunkier with less technical detail paid to the application of the decoration, yet this is not a clearly definable or quantifiable trait, making the distinctions subjective. As Spence et al. note, along the border in south central Ontario, the distinctions are blurred and sites are often alternately assigned to the Saugeen or Point Peninsula traditions (Spence et al. 1990:148).

A word of correction must be put forth here because there seems to be a modicum of confusion related to another possible indicator of affiliation. Spence et at., state for Point Peninsula pottery "most of the exterior is decorated, and occasionally a red ochre wash is added" (1990:148). Neither of these statements seems to hold true when examining the referenced sources of Finlayson (1977:630-631) or Wright and Anderson (1963). In regards to exterior decoration, the opposite is true and Saugeen pottery has a higher incidence of overall exterior decoration (Finlayson 1977:631; Wright and Anderson 1963:47). Ochre washes also seem to be less of a Point Peninsula trait, and more common to Laurel pottery, with notable recoveries along the north shore of Lake Superior (Wright 1967:11-14), and pottery of that affiliation from the Donaldson site (Wright and Anderson 1963:33). No evident references to occurrences of ochre wash on Point Peninsula pottery could be found (including Jenneth Curtis, personal communication 2007).

Laurel ceramics are also differentiated best geographically as "the closer the Point Peninsula 2 focus sites of Southeastern Ontario are to the Precambrian Shield the closer they resemble the Laurel sites of the Shield proper" (Wright 1967:110). Nevertheless there are differences in trait frequencies such that Laurel pottery tends to have thinner walls, finer temper, finer toothed dentate, higher use of the drag-stamp technique, decoration in zones limited to the upper portion of the vessel, and horizontal lines used to demarcate motif elements (Wright 1967; 1999b:743). Simply stated, Laurel Tradition pottery has well applied zonal decoration limited to the upper portion vessels which are thinner walled and less chunky, therefore appearing more refined than Point Peninsula and Saugeen vessels. Unlike the subtle differences between Saugeen and Point Peninsula pottery, Laurel pottery tends to stand out due to its refined nature.

However, geographical site type biases in the definition of typical Laurel pottery must be acknowledged. For example, as Arthurs (1986:1) and Reid and Rajnovich (1991) account, the early interpretations from the Rainy River valley in western Ontario (e.g., Vickers 1948; Wilford 1950a, 1950b), and a continued focus on this region has strongly influenced many subsequent studies (e.g., Wright 1967). This influence is of importance as sites from the Rainy River area are typically burial mounds or habitation sites that may be affiliated with the mounds (i.e., possibly ceremonial occupations related to the mounds). Pottery from these sites could be ceremonial finery atypical of the general range of more utilitarian pottery used elsewhere. Conversely, pottery from the Ballynacree site, a Laurel village site, does not exhibit significant differences from other sites (Reid and Rajnovich 1991:201). Further east, i.e., along the north and northeast of Lake Huron and Georgian Bay, Wright (1967:110, 1999:728), suggests "Laurel" pottery is difficult to distinguish from Point Peninsula pottery given the sharing of traits, and that sites can be grouped into their appropriate culture history box based on lithic assemblages instead. Conversely, Dodd and Lennox (1996:143), while acknowledging northern influences (i.e., Laurel) in their Port Severn area lithic assemblages, find there are indeed differences in pottery from southern Georgian Bay to their Lake Superior and more westerly comparative collections. In particular, they note Laurel pottery lacks "the quantity of lip, interior or body decoration...significant amounts of rocker or dentate stamped pottery" (Dodd and Lennox 1996:143) that the Port Severn pottery exhibits. However, Dodd and Lennox's comparative Laurel sample is from sites a great distance to the east, the closest being the Heron Bay site (Wright 1967), approximately 650 km distant.

Pottery from the Frank Bay site, on Lake Nipissing, has been alternately aligned to Laurel or Point Peninsula affinities. Ridley (1954) initially places one of the site's stratum and its associated pottery into the Point Peninsula sequence, fitting into the New York state typology. Wright (1967:111) suggests that while the Frank Bay rims are similar to those from more southerly sites, they are in a couple of stylistic ways more akin to Laurel pottery; a quality Wright does not quantify. Brizinski, (1980) in his archaeological survey of Lake Nipissing, assumes a Laurel typological assignation of the pottery from both Ridley's 1954 Frank Bay excavations and his own from the same deposits. Notably, Brizinski (1980) does not provide criteria for such his determinations of affiliation. Thus, while we can provide a nice definition for western Laurel pottery (i.e., along the North Shore of Lake Superior), a lack of properly documented sites and analyses in the northern Georgian Bay and Lake Huron region limits the application of local comparisons.

Accordingly, Laurel Tradition pottery is not further examined in this analysis. Over the multiple years of excavations, through previous small-scale pottery analyses, and with examination of illustrations, photographs and descriptions of pottery from Laurel sites (Arthurs 1986; Dawson 1981; Dunlop 1998; Kenyon 1970; Lugenbeal 1976; Mason 1991; Reid and Rajnovich 1991; Wright 1967), not once has a Laurel pottery connection to the Kitchikewana site been hinted at. This is justified given the notably different quality and style of well defined Laurel pottery (i.e., typically from western Ontario), which has never been recovered at the site. Conversely, the identification of cultural or social networks and/or affiliations cannot be left simply to pottery alone. As Wright (1999b:774) notes, the blurred boundary between the Laurel and Point Peninsula Traditions often has sites with pottery more like Point Peninsula and lithic assemblages more akin to typical Laurel ones. This is also suggested by Dodd and Lennox's research around Port Severn. Thus, for evidence of a Laurel, or perhaps more appropriately called a northern influence at the Kitchikewana site, the lithic assemblage should perhaps serve as the indicator. Unfortunately this is beyond the scope of this analysis.

For the purposes of this analytical study, more tangible defining characteristics for Saugeen and Point Peninsula were required. Thus a literature survey of the major archaeological sites from both Saugeen and Point Peninsula traditions was undertaken to quantify the aforementioned defining trends (e.g., more interior channelling, thinner vessel walls). Corresponding data was sought in published sources and where possible statistics were gathered and tabulated to create a range of expected frequencies for the indicative variables. The primary variables or traits sought were: interior surface modification, vessel wall thickness, temper size, lip form, decorated and undecorated body sherd counts, and the presence of ochre washing. The results of this survey are presented in Appendix C: Defining Middle Woodland Pottery Traditions.

Origins, Regional and Temporal Variation of Ontario Pottery

In order to comprehend the origin of Saugeen and Point Peninsula Vinette 2 ceramics, it is best to have a grasp of, not only the tradition, but the associated discourse. The earliest ceramics in Ontario are Vinette 1 wares. While Vinette 1 ceramics appear with the transition from the pre-ceramic Late Archaic to the Early Woodland period, which occurred circa 800 or 900 B.C. (Spence et al. 1990:125), caution must be exercised as many aceramic sites post-date the Early Woodland. Vinette 1 ceramics are conoidal or sub-conoidal with straight to slightly outsloping rims. They are coil constructed and typically all surfaces are cord roughened. Vinette 1 wares are characteristically crude with thickly walled bodies and large particle, grit temper. They occur from New York State into southern Quebec and across southern Ontario. The quantity of Vinette 1 recoveries in Ontario is, however, limited and sites have predominately been found and dated only in the southern portion of the province (Jackson 1986:399; Wright 1999b).

In 1949, Ritchie and MacNeish were unable to determine the origins of Vinette 1 ceramics. They did not conceive that the creation of ceramics could be a local development. This bias was likely due to the prevailing historical particularistic philosophy behind McKern's taxonomic method (and subsequent similar models) whereby cultures were collections of accidentally merged traits that did not evolve internally or in-situ (Trigger 1989). The impetus for change was seen as an external factor, namely migration, and thus origins were sought elsewhere. Antecedents from explored regions to the south were ruled out due to a lack of cord-making in earlier contexts (Ritchie and MacNeish 1949:100). Hence, the less well known north was postulated as the origin of Vinette 1, and possibly Vinette 2. Ritchie and MacNeish even go as far as to hint at an Asian origin for the Vinette ceramics (Ritchie and MacNeish 1949). Wright follows this in his 1967 *The Laurel Tradition*, where he formulates an Asiatic hypothesis for the origin of Middle Woodland ceramics in the east. Wright (1967) believes that, based on decorative techniques, Early Woodland and subsequent Middle Woodland Hopewellian ceramics originated in the south while the Laurel tradition stems from northern Asia. Origins in Asia were weakly indicated by the early presence of pseudo-scallop shell decorated wares, whereas these were not present in North America until later. The blending of the Asiatic Laurel and southern Hopewellian groups, within an earlier indigenous base, created the Point Peninsula 2 and Saugeen foci (Wright 1967:4). Wright's "veneer of evidence" (1967:133) for the Asiatic origin of Point Peninsula in Ontario stem from pottery attributes. From early Bronze Age sites in Russia Wright notes the presence of pseudo scallop shell decorations, while a Neolithic site has some evidence of decoration similar to dentate stamping (Wright 1967:133).

Again, this is indicative of the approaches to culture and cultural change under a historical particularistic philosophy.

Wright observed chronological change in both the Saugeen and Point Peninsula ceramic assemblages, most notably a shift in the frequencies from predominately pseudo-scallop shell in early components to primarily dentate decoration (Wright 1967:110). Additional temporal indicators include a possible increase in drag-stamping, an increase then decrease in rocker-stamping and that cord wrapped stick decoration does not appear until late into the sequence (Johnston 1968; Spence et al. 1990:158; Wright 1967:110).

Subsequent developments have shown that, while these decorative trends appear valid, they are most likely not representative of an Asiatic origin and are now viewed as regional developments. Jackson's 1986 assessment of carbon 14 dated features containing Vinette 1 wares from the Dawson Creek site on Rice Lake shows chronological continuity from the Late Woodland Vinette 1 bearing Meadowood Tradition to Vinette 2 Point Peninsula Tradition ceramics (Jackson 1986:396). Jackson found what he termed 'aberrant' Vinette 1 wares with thinner walls, pointed lips, finer paste, smoother surfaces, and punctuate decoration, suggestive of Vinette 2 (Jackson 1986:396). Dated circa 370 B.C. (one of the latest Early Woodland dates yet recorded) the recovery suggests regional, in-situ development of Vinette 2, Point Peninsula ceramics in south central Ontario.

While generally classified as Vinette 2, the ceramics vary in decoration across the broad region and timeframe of the Point Peninsula Tradition. Some sequencing of this variation has taken place, leading to a heightened awareness of the temporal as well as the spatial variability of Point Peninsula ceramics. Such temporal sequencing of Saugeen pottery has not yet occurred, other than the shifting decorative tool trend, given the limited data available. Initial studies on the temporal sequencing of Point Peninsula ceramics are predicated on Ritchie and MacNeish's (1949) 15 different types of Point Peninsula pottery, of which 6 are applicable to studies in Ontario. As summarized by Curtis (2004b:26) they are:

> **Vinette Dentate** – simple linear arrangements of rectangular dentate impressions on conoidal vessels with outflaring rims
> **Vinette Complex Dentate** – zoned areas of complicated dentate impressions resulting in ribbon-like bands on vessels with everted rims
> **Point Peninsula Corded** – horizontal and oblique impressions of a cord wrapped stick or cord wrapped paddle edge on vessels with outflaring rims
> **Point Peninsula Rocker** – bands of dentate or straight-edged impressions applied with a rocking motion on conoidal pots with outflaring rims
> **Point Peninsula Plain** – smoothed surface vessels with plain exteriors and incised lines on lips, vessels are outflaring
> **St. Lawrence Pseudo-Scallop Shell** – sinuous impressed lines on rims with sharply outflaring rims

Ritchie and MacNeish utilized frequency seriation to order components bearing these ceramic types and subsequently proffered their technique and its applicability to other Point Peninsula sites as a means of ordering components within their temporal sequence. Dailey and Wright (1955) performed such a seriation at the Malcolm site, in the process creating a new regional type called Malcolm Push-pull – notable for the application of a dual-pronged tool using the push-pull decorative technique (Daily and Wright 1955:13) – and placed the site in the middle of the Point Peninsula sequence.

At the Kant site in Renfrew County, Emerson also undertook such seriation and through his analysis discovered that the Kant ceramics did not conform to the existing types. Therefore he placed the Kant site in the early middle period of Point Peninsula stating that it "gravitated into a cultural sphere of its own" (Emerson 1955:39). Regardless, the high incidence of push-pull dentate and pseudo-scallop shell decoration, combined with a low incidence of the rocker technique, is evidence of the relation of the site to the New York typology (Spence et al. 1990:161). Ceramics from the Kant site are characterized by a fairly even distribution of decorative impressions including simple dentate, complex dentate, linear stamp, and pseudo-scallop shell (Daechsel 1981:92-98). However, if one just includes tool type, dentate is the most popular at approximately 50 percent of the rim sherd collection (Daechsel 1981:96). Typical rims are slightly everted to straight, smoothed on the exterior, and combed on the interior where decoration is popular.

Another notable application of the typological method was completed by Johnston (1968) at the Serpent Mounds site where he identified a new Rice Lake-banded type. Rice Lake-banded ceramics, while exhibiting variability, are characterized by dentate decoration oriented in motif bands and, apparently, some castellations are present (Johnston 1968:56-63). Based largely on the new type, Johnston created the stand-alone Rice Lake Phase, left floating in the middle of the Point Peninsula sequence without indentified predecessors or successors (Curtis 2004b).

Further regional variability of Point Peninsula ceramics was noted by Daechsel (1981) at the Sawdust Bay-2 site where attribute analysis of the assemblage, rather than typological analysis (compared below), highlighted differences in attribute frequencies when compared with the Kant site. At Sawdust Bay-2, pseudo-scallop shell decoration dominates the predominately smoothed exterior, combed interior vessels (Daechsel 1981:122). Furthermore, a lack of correlation with Ritchie's Canoe Point Phase, the closest phase geographically, and Johnston's Rice Lake Phase (1968) led to the creation of the Ottawa Valley Phase. Daechsel (1981) dates the Ottawa Valley Phase as occurring between 100 B.C. and A.D. 200 thus as early to middle Point Peninsula. Due to insufficient evidence in the region it cannot be placed into a sequence of temporal development nor can it be related to other local Point Peninsula manifestations.

More recently, Curtis (2004b) has added a great quantity of detail to the Point Peninsula ceramic sequence in the Rice Lake vicinity. Curtis' analysis of pottery from multiple sites around Rice Lake and the Trent River led to the division of the Point Peninsula Tradition into three ceramic based phases generated as a result of multiscalar attribute analysis. The sequence begins with the Trent Phase, followed by the Rice Lake Phase, then finally the Sandbanks Phase which is seen as an in-situ transitional phase to the early Late Woodland Ontario Iroquois Tradition (Curtis 2004b). Curtis (2004b:216-229) describes the characteristics of the pottery for each phase as such:

> **Trent Phase** (? B.C. – A.D.1) – pseudo-scallop shell stamping and thin everted rims are diagnostic while dentate and cord wrapped stick stamping, convex lips, and oblique line configurations are common.
>
> **Rice Lake Phase** (A.D. 1 – 800) – Dentate, combed, superimposed surface treatments and complex stamping (rocker, rolled and dragged) are diagnostic. Collarless rims; convex interiors and concave exteriors; convex or straight lips; dentate, cord wrapped stick, and pseudo-scallop shell stamping are all common.
>
> **Sandbanks Phase** (A.D. 700 – 1000) – Diagnostics include textured surface treatments, banded exterior motifs delimited with bosses or punctates, cord wrapped stick decoration in second exterior band and a plain first band. Collarless rims, dentate stamping, and oblique right lines on the interior, lip, and exterior surface are common.

Curtis' interpretation is of local continuity throughout the Middle Woodland period that ties the Point Peninsula manifestations to local descendents. Such in-situ development within the Middle Woodland and ensuing transition to Late Woodland periods is likely applicable to other regions, i.e., that of the Saugeen Tradition (Curtis 2004b:256). However, as noted above, Curtis' model is in contrast with that of Smith (1997), whereby Smith places late Point Peninsula and early Late Woodland assemblages in an overlapping time period. The discrepancy between Curtis' and Smith's models is due of the flaws in the cultural-historical taxonomic models as demonstrated by Hart and Brumbach (2003, 2005, 2009) and Moore (1994) which ignore the fluidity and unbounded nature of populations at this time.

In sum, current evidence in Ontario suggests that, in the region ascribed to the both the Saugeen and Point Peninsula traditions, Vinette 1 ceramics gradually developed into the more refined Vinette 2 series or somewhat similarly refined Saugeen pottery. This occurred circa 370 B.C. according to Jackson (1986), which corresponds with the dates presented by Smith (1997) and Spence et al (1990). As Curtis aptly demonstrates, ceramic styles change throughout the Point Peninsula Tradition and the earlier noted shift from pseudo-scallop shell to dentate stamping is supported. The same shift is supported in the Saugeen Tradition (Finlayson 1977:590). As the variability amongst the other noted studies makes obvious, there is also considerable regional variation occurring within Point Peninsula and Saugeen (Wright 1999b:629); this is not unexpected given the large area of the traditions. For example, while pseudo-scallop shell is more popular than cord wrapped stick in Ontario, the opposite is true in New York State (Spence et al. 1990:157). Variation aside, there is general continuity demonstrated in form and style (grit tempered, coil manufactured, straight to outflaring and everted collarless rims, decoration with dentate, pseudo-scallop shell and cord wrapped stick stamping) within the breadth of time and geography covered by the Point

Peninsula and Saugeen traditions, as is expected under an ethnogenesis perspective. People were not living in isolated groups; there was profound interaction across the region, and beyond.

A Synthesis of Settlement, Subsistence, and Interaction

The similarities of the Saugeen and Point Peninsula traditions has been previously noted (Wilson 1991), and given the expected interaction among hunter gatherer groups at this time (Jamieson 1999:183), perhaps we should not expect bounded cultures or traditions. Rather, the expectation should be for a continuum of gradual change from area to area, with geographically neighbouring communities sharing more traits than those farther removed (Ferris and Spence 1995:98). As Ferris and Spence (1995:85) state, "It may be, then, best to follow Wilson's (1991:10) suggestion and drop these terms, except perhaps as spatial designations, and concentrate instead on the definition and analysis of much more localized complexes." Examination of the settlement, subsistence, and interaction patterns defined, largely on site investigations by Finlayson (1977) for Saugeen and from Rice Lake area sites for Point Peninsula (Curtis 2004b, 2006; Ferris and Spence 1995; Spence et al. 1990), further demonstrate these similarities, however local variation is noted.

Seasonality of occupations and seasonal settlement for Point Peninsula groups have been largely inferred from the early excavations at Rice Lake (Johnston 1968). However, settlement and subsistence practices were likely locally defined based upon the environment at hand (Wilson 1991).

Curtis' (2004b, 2006) refined sequence of ceramics in the Rice Lake region has helped to highlight temporal changes in settlement and subsistence patterns first speculated through excavation of stratified sites, for instance Serpent Mounds and Cameron's Point, in the 1960s. It appears that during the Trent Phase, short-term and/or relatively small populations occupied several seasonal waterfront locations where hunting and gathering took place. However, this is based on only a couple of sites and as Spence and Fox (1986:36) suggest, the Rice Lake area may reflect "a more elaborate society."

In the subsequent Rice Lake Phase, two types of sites become apparent: base-camps and campsites (Curtis 2006). Procurement of resources for the base-camps was likely the objective of the campsites. It is at this time that extensive shell middens also appear, illustrating an increased reliance on shellfish. Again, caution must be exercised with the sample size here, as the number of sites is limited. Furthermore, the larger sites associated with burial mounds may be unique assemblages related more with ceremonial feasting than typical daily activities.

Reconstruction of rank, status, and societal organization during the Rice Lake Phase has been attempted mostly through studies of material excavated from burial mounds around Rice Lake (Spence et al. 1990; Spence et al. 1984) . However, as Jamieson (2008) and Ferris and Spence (1995:101) document, there is ample disagreement on the models of social organization that are represented (i.e., ranked, hierarchical, or egalitarian), and the same data has been used to support different conclusions.

Bands are typically viewed as exogamous and generally the pottery makers, assumed to be women, moved at the time of marriage taking their pottery style with them (Wright 1999b:611). Aberrant vessels are often interpreted within this theory as indicative of patrilocal society *and* are used to thus support the theory. Predicated on cyclical argument, unsubstantiated anthropological theory, and lacking ethno-historic correlates, this patrilocal model must be scrutinized since the only evidence is a few ceramic vessels found outside the boundary of their ascribed traditions; conceivably this is evidence of trade rather than patrilocal organization. Conversely, evidence of matrilocality in pottery could be relative homogeneity (Spence 1974:384), but this is an ephemeral notion and not truly quantifiable.

The introduction and fluorescence of burial mound construction and a mortuary complex stretching along the Trent-Severn Waterway in the Rice Lake area, has been used as evidence of influence and interaction within the Hopewellian sphere (Spence et al. 1979:119). But as Ferris and Spence (1995:102) note, this seems relatively limited to the Rice Lake area, and exchange networks elsewhere are differently aligned.

Furthermore, although some interaction is perceptible through the appearance of exotic shell beads, silver and copper, panpipes and panpipe covers, there is little evidence to support belief that the Rice Lake people shared the same cosmology and their participation was "marginal and highly selective…" (Spence et al. 1979:119). Aside from Rice Lake, in Ontario there is limited evidence of Hopewellian goods, which Ferris and Spence (1995:102) speculate this is further manifestation of localized groups participating in their own "exchange relationships."

Settlement and subsistence patterns into the Sandbanks phase remain similar and the same sites are occupied, furthering the cultural continuity of the Point Peninsula Tradition throughout the Middle Woodland (Curtis 2004b). However, at the end of the Rice Lake phase the Hopewellian goods are no longer found. Indicators of status in burials disappear, burial mounds are no longer constructed (aside from three possibilities), cremations become rare, and panpipes and silver are no longer found (Spence et al. 1979:121; Spence et al. 1990:165). Curtis (2004b:229) posits that in-situ development of the Sandbanks Phase leads into Wright's (1966) Early Iroquoian Stage and the introduction of maize horticulture.

Subsistence during the Middle Woodland is typically seen as hunter-gatherer, with the focus being on locally available resources, typically with a reliance on aquatic species (Ferris and Spence 1995:100; Spence and Fox 1986:36; Spence et al. 1990). Most prominently has been the denial of cultivated plants in Ontario during this period (e.g., Ferris and Spence 1995:100). This is contrary to analysis of skeletal remains from Serpent Mounds, demonstrating maize as a component of their diet by circa A.D. 500 and was a major dietary component by A.D. 1000 (Harrison and Katzenberg 2003), predating the Early Iroquoian stage and the supposed timing of the maize transition. This again highlights flaws in taxonomic entities that imply subsistence.

Finlayson (1977:482-482) suggests the Donaldson site Middle Woodland occupants were likely at the location to take advantage of fish spawning at the rapids in the spring and early summer. Similarly, while subsistence patterns are difficult to recreate at the Thede site, given a paucity of faunal material, Finlayson suggests the site was used primarily in the spring or early summer as a fishing local, with some fishing continuing into the fall. Lastly, Finlayson (1977:594) sees the Inverhuron-Lucas site as a latter Saugeen tradition settlement of a different type than Thede and Donaldson, as the Inverhuron-Lucas sites has netsinkers, fishhooks, and nut processing; all lacking at the other sites. Finlayson interprets these recoveries as evidence of a late summer to fall microband occupation and that it was a short-term use based on a lack of pottery style variability (Finlayson 1977:557-558, 576). Subsistence seems to differ only significantly in the use of shellfish by the Rice Lake groups, but this may not be indicative of the Point Peninsula at large, but rather local environmental adaptation, or ceremonial feasting activities related to the burial mounds. Generally the pattern is thus broadly similar, with local variants and must be examined at the local level for evidence of subsistence and settlement patterns they will vary from group to group and through time as well.

Initial Late Woodland

Smith (1997) provides a succinct and accurate description of the timing and conflicting theories on the Middle to Late Woodland transition while Curtis (2004b:47-51) and Williamson (1990) provide detailed accounts. To reiterate, the transitional period importance relates to the opposing views; one being that the ancestors of the Northern Iroquoian groups (Huron, Tionnontonaté, Neutral, and Erie) immigrated into the area with maize as a major component of their subsistence (Snow 1995, 1996). The competing, and generally more widely accepted theory is one of indigenous development where the local populations were not displaced, but rather adopted maize into their subsistence systems; a local development of what become the Northern Iroquoian people (Crawford and Smith 1996; Curtis 2004b; Fox 1990; MacNeish 1952; Murphy and Ferris 1990; Spence and Pihl 1984; Wright 2004). However, while there is no necessity to have Iroquoian identity to participate in agriculture, the presence of agriculture is often held as evidence of Iroquoian groups. Hart and Brumbach (2009) argue either theory, in-situ or intrusive, is flawed and fails to recognize social processes and the fluidity of the population.

Key components of "Iroquoian" sites are typically held to be villages of longhouses, which are sometimes palisaded, with associated middens (Curtis 2004b:37). Typical locations are in areas of sandy soil (Williamson 1990:306). Smaller campsites for resource procurement, such as hunting and fishing which were heavily relied upon, are present while horticultural reliance increases gradually though time (Williamson 1990:306, 312-313). To reiterate from above, more recently this settlement pattern has been shown to be flawed owing to the differing timing of these traits, that only converge into the identifiable Iroquoian suite possibly as late as A.D. 1300 (Engelbrecht 1999; Hart and Brumbach 2003, 2009; Hart and Englebrecht 2011; Martin 2004, 2008).

Furthermore, Curtis (2004b:41) suggests these "Early Iroquoian sites are primarily identified by ceramic characteristics", a statement seen here as flawed based upon the ethnic identity blindly inferred; again pottery does not equal ethnic identity. Regardless of the ethnic identity issues it is an archaeological construct with temporal validity in Southern Ontario, appearing circa. A.D. 900 to 1300 (Smith 1997). The traits noted by Williamson (1990:295) include: well-made, thick-walled, globular shape, rounded bottoms, modelling manufacture, collarless, and typicallty uncastellated (but when castellations occur they are simple). Decoration is notably variable in technique and motif, however interior and exterior decoration of the upper vessel is common. Oblique dentate or linear stamping in the rim area is the most common combination. Punctation is often used, either on the interior or exterior. As with the Middle Woodland pottery, these traits are again pan-regional and social boundaries were likely not strong (Jamieson 1999:185)

Summary

This chapter examines the current archaeologically constructed Middle to Late Woodland setting in Ontario, and associated regions as applicable. Archaeology in Ontario is demonstrated to be dominated by antiquated typological and taxonomic schemes (in particular adaptations of McKern 1939) generated under the culture-historical paradigm which serve to alternately homogenize the past by creating and utilizing bounded cultural boxes which transcend vast quantities of time and space, while blindly confer an ethnic identity upon the boxes via a direct historic approach. Martin (2008:455) notes this region's preoccupation with defining cultural boxes based on recurring artifact traits, refining chronological sequences within these boxes, and delineating the geographic boundaries for the boxed cultures. This is a fundamentally flawed perspective biased by a quest to link current ethnic groups with archaeological materials.

The following analysis of the Kitchikewana provides further evidence that the prevailing structures need to be torn down and replaced with local, contextual perspectives.

CHAPTER 3: SITE BACKGROUND

This chapter places the Kitchikewana archaeological site in context. This begins with a description of the geological and geographical settings, both past and present. Next, the history of archaeological investigations are presented, followed by a description of Parks Canada's excavation methodology. Lastly, the results of the excavations are summarized, presenting a brief culture history of the Camp Kitchikewana archaeological site.

Geography and Geology

While placed entirely within Chapman and Putnam's (2007) Georgian Bay Fringe physiographic region, Beausoleil Island truly straddles the southern edge of the Canadian Shield and exhibits the ecosystems of both the Shield and southern hardwood forests. This division is better captured in Chapman and Putnam's (2007) physiographic landforms which portrays the shift from the northern portion of the island which lies in the Bare Rock Ridges and Shallow Till area, to the southern section that is in the Sand Plain landform. Thus, the north of the island is characterized by thin soils, rugged windswept granite outcrops, and coniferous species. In contrast, southern Beausoleil is blanketed with deeper soils supporting lush hardwood forests. The Kitchikewana site is in a transitional zone between these landforms, in an area characterized by deep sandy soils with vegetation consisting primarily of widely spaced red oak trees with some white and red pine and spruce (Thaler 1973:4). Grasses and poison ivy are the dominant ground covers.

The most prominent physical formation on Beausoleil Island is its "spine", an elevated ridge running nearly the entire length of the island from north to south. Terasmae (1971:3) suggests the material of this feature was deposited as a drumlin (or two) of glacial till, sand, and gravel that is surrounded by lower elevations of glacial till deposited circa 13,000 to 10,000 B.C. Immediately post-glaciation, circa 10,000 B.C., water levels in the Georgian Bay basin remained high, through what is known as the Algonquin phase, possibly into the Post-Algonquian Lake Ardtrea phase (Morgan et al. 2000:14-15), and Beausoleil Island was inundated until lake levels dropped circa 8,400 B.C. (Jackson et al. 2000:419). Up to circa 3,500 B.C. water levels in Georgian Bay were very low, so much so that Beausoleil was, for a time, connected to the mainland. As water levels rose and Georgian Bay began to fill, modern lake levels were attained and then surpassed when water reached a maximum of approximately 184 meters above sea level (m asl) between 3,000 and 2,500 B.C., a period known as the Nipissing transgression (Jackson et al. 2000:419). During the Nipissing transgression the Kitchikewana site, situated at 181 m asl, was inundated for an undetermined time. Water levels receded after 2,500 B.C., exposing the Kitchikewana site area. Levels fluctuated, dropping slowly throughout the Algoma phase to the present Huron phase over next couple of millennia. The Algoma phase created steep, eroded shorelines into glacial till deposits around the bay. Georgian Bay settled near the current level (176 m asl) around A.D. 1.

The core of the Kitchikewana archaeological site lies on a large sandy post-glacial Lake Algoma beach ridge with a steep embankment, overlooking the current shoreline of Beausoleil Bay, some 6 m below. Soil layers are relatively consistent across the site (excluding areas of archaeological features and disturbances) with the surface being loose light yellowish brown sand, overlying a recent thin compacted layer of black to greyish black sand and leeched organics. The compacted modern layer overlies a transition zone of mixed/mottled sands from the overlying black sand and underlying yellow or golden sand strata. The yellow or golden sand layer is typically very deep, at times reaching thicknesses of 50 cm, with no perceptible changes in soil colour, composition, or compaction. Beneath the yellow sand is glacial till composed of whitish coarse sand and granite cobbles. While not yet formally studied, the post-glacial sands of the Kitchikewana site appear to be lacustrine deposits, likely accumulated during the Algonquin and/or Nipissing high water phases. Bedrock on Beausoleil is pink granite, however in the Kitchikewana area, glacial and post-glacial deposits are substantial and bedrock has not been uncovered through archaeological excavations.

History of Archaeological Investigations

Parks Canada archaeologists first recorded archaeological material, the remnants of a then indeterminate historic occupation, during surveys along the west shore of Treasure Bay (Figure 3) in the early 1970s (Swannock 1970). Archaeological investigations by Parks Canada in 1985 (undertaken to add an archaeological resource management statement to the YMCA's lease), found Late Woodland pottery and a few lithic artifacts eroding from the edge of the sandy ridge in front of the mess hall (Foster 1985:8). In 1989, the YMCA sought to install new septic tile beds. Due to the knowledge that a site existed under portions of the camp, shovel test pits were excavated in the installation areas. Although the scope was limited, the testing demonstrated that both precontact and historic cultural resources underlie portions of the YMCA camp property. Further YMCA site development and use necessitated the mitigation of two areas by Parks Canada (see Figure 4) the seniors' septic system (excavated in 1990), and

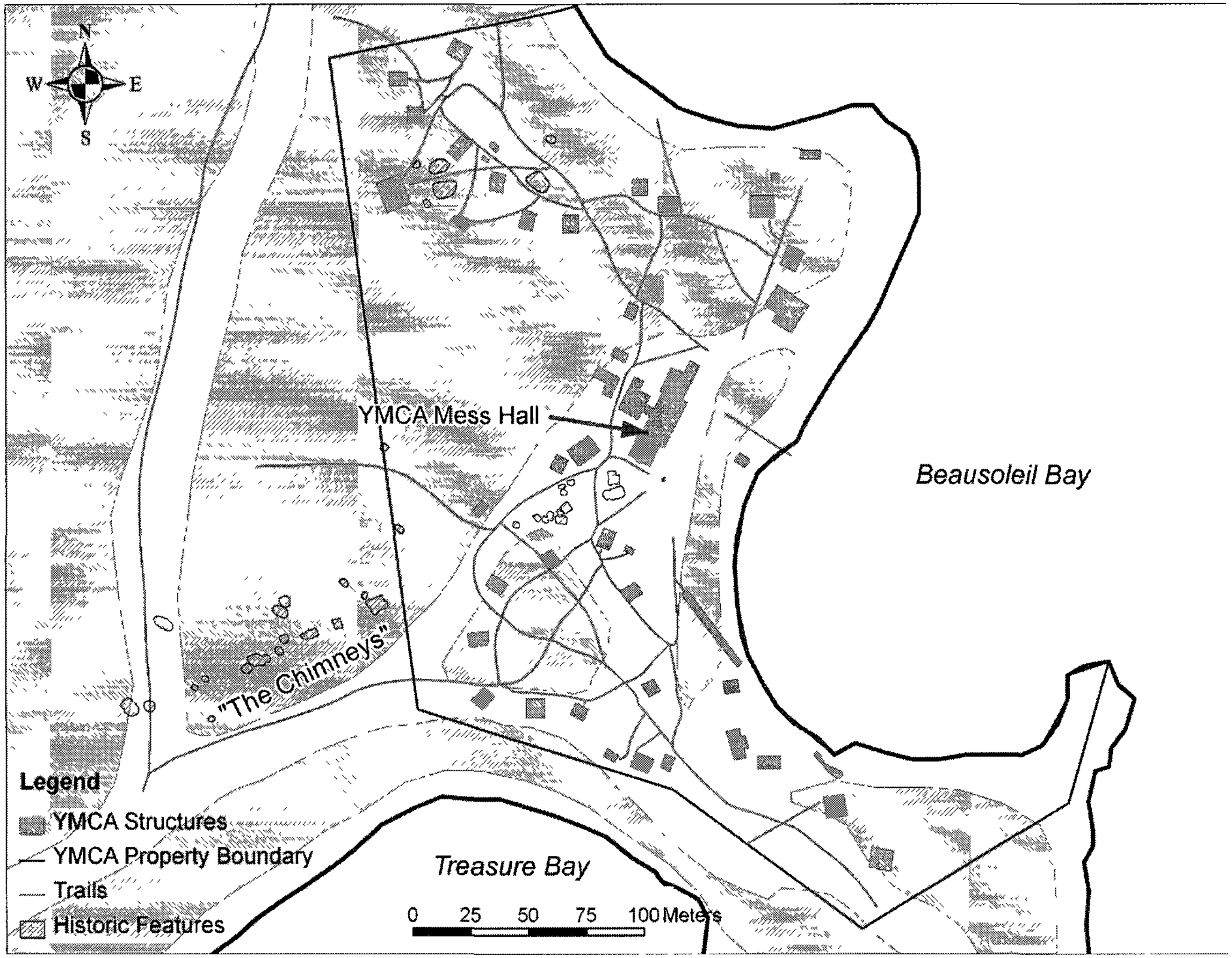


Figure 3. Overview of YMCA Camp Kitchikewana

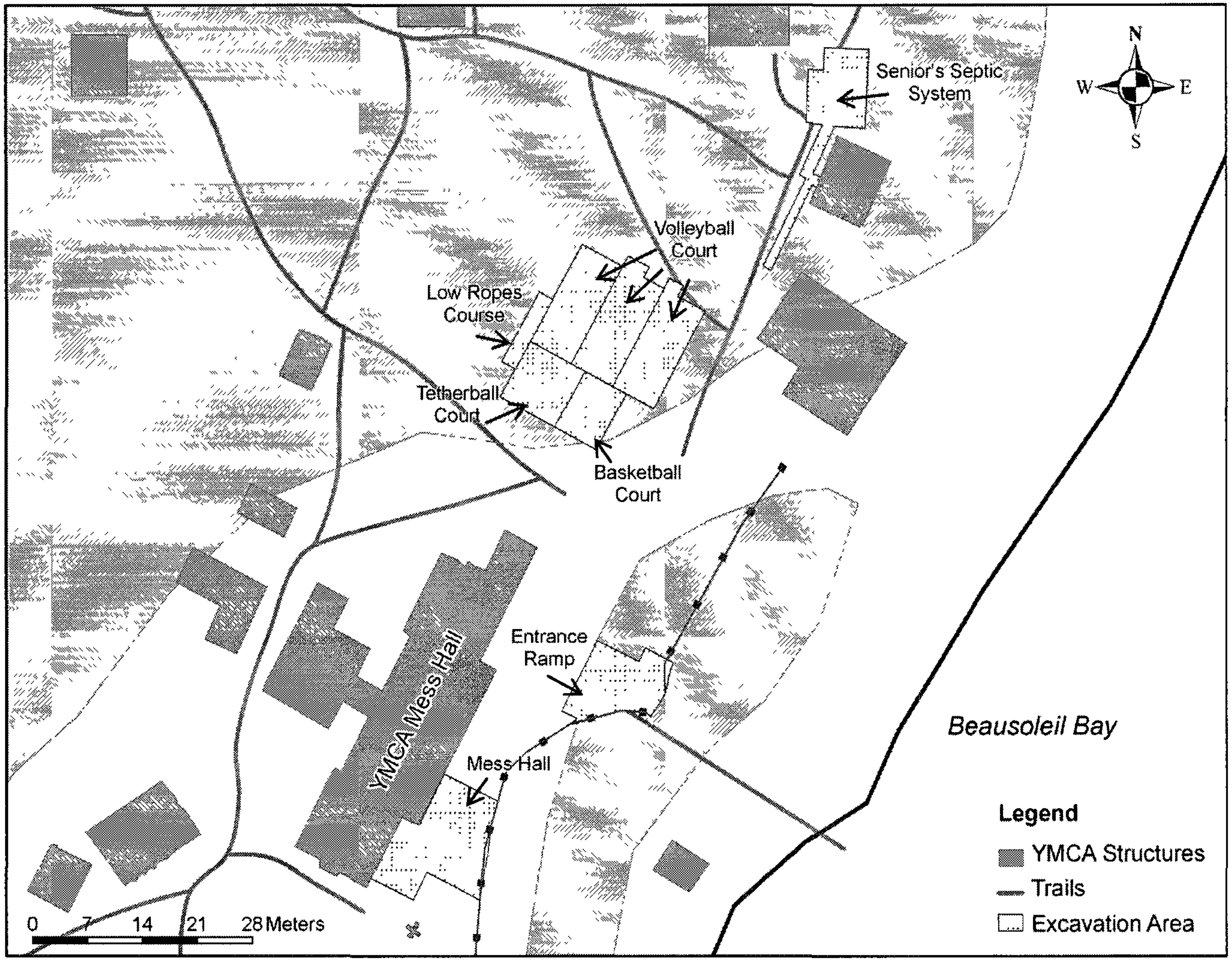


Figure 4. Kitchikewana Excavation Areas

the adjacent volleyball court (excavated from 1992 to 1994). Excavation of these areas established the presence of a least "six distinct cultural groups" who utilized the site from circa 1,200 B.C. up to the 19th century (Ross 1995:9). While this greatly increased the known history of Beausoleil Island, large portions of the camp had yet to be assessed.

Ascertaining the importance of any archaeological resources underlying Camp Kitchikewana was accomplished through comprehensive shovel testing by Parks Canada over the 1995 and 1996 field seasons. This testing revealed significant historic and precontact artifact concentrations in many areas. This combination of mapping, shovel testing, and surface surveys by Parks Canada verified the presence, and the precarious state, of the resources underlying the camp.

Due to the continual impact of the camp operations on the underlying cultural resources, a multi-year mitigation strategy was developed by Parks Canada in 1999. Time and funding dictated targeting areas where cultural resources were most in jeopardy. To establish these areas of highest risk, the frequency of artifacts, as determined by the 1995 and 1996 testing, was compared to land use patterns in the camp. Thereby, areas with high use frequency (e.g., foot traffic) combined with high concentrations of artifacts were slated for future archaeological mitigation.

Mitigation through this process, began with the multi-year excavation of a large block southeast of the Camp Kitchikewana mess hall, (excavated from 2000 to 2003), followed by the excavation of the camp's basketball court (2004), the entrance ramp area (2005 and 2006), and the tetherball court (2007). While annual excavations have continued to present, they are beyond the scope of this study as they occurred after the analysis was started.

Analysis of the large artifact assemblages from the varying excavations areas is in various stages of completion. Both the entrance ramp and tetherball court assemblages, from 2005 to 2007, have yet to be studied. While material from the 2000 to 2003 mess hall excavations and the basketball court has been reported upon (Mortimer 2006; Teal et al. 2009), detailed pottery analysis (i.e., attribute analysis) has not been conducted. Data from the 1990 senior septic and 1992 to 1994 volley ball court excavations has only been summarily studied and reported on (Ross and D'Annibale 1994) and requires analysis. The only formal study of pottery from the site was undertaken in 1990 by Ross et al. and examines just the pottery from that year's excavations. Furthermore, while this analysis identifies many Saugeen and Point Peninsula vessels, the definitions used for identifying these traditions provide little in terms of differentiating the two. Moreover, while purporting to be an attribute analysis (Ross et al. 1990:2), the method is in fact typological, using defined characteristics for the various traditions then attempting to place individual vessels into one of the tradition types.

Excavation Methods

Parks Canada's typical excavation methodology, in place from the 1990 excavations on, was to excavate in 1 x 1 m or 2 x 2 m units, in quadrants, following stratigraphic layers. However, much of the archaeological deposits at Camp Kitchikewana are contained in a rather homogenous yellow sand layer with negligible soil distinction. Therefore, 5 cm arbitrary levels were used within deposits of greater than 5 cm, in the rare chance that artifact changes might be present. All units were excavated to a depth of 10 cm below the last artifact or archaeological feature, or to the distinct cobble surface of glacial till.

Depositional Context and Assemblage Limitations

A further note on the stratigraphic nature of the Kitchikewana site is warranted, given the difficulties it imposes. First, all eras of occupation are readily recognized through artifacts readily found on the surface, churned up by foot traffic, freeze-thaw action, and other taphonomic and anthropogenic causes. Second, the Kitchikewana site has been occupied for millennia, yet most of the remnants of these past visitors are contained in the aforementioned homogenous yellow sand deposit. Nearly all in-situ primary deposits from the site are related to the historic occupations and everything else is in moderately to significantly mixed deposits and individual artifacts are at best correlated to specific occupations based upon diagnostic attributes. As such, this renders large portions of the assemblage nearly mute, as there is no solid context. For example, most of the faunal remains from the site, unless specifically from a dated feature, could be deposits from the earliest occupants though to the historic period, circa 1850. The same is also especially true of the lithic debitage assemblage, which lacks inherent temporal indicators. Thus the temporally diagnostic potential of the pottery assemblage is of importance in developing our understanding of the Kitchikewana site.

Many of the artifacts are also highly fragmented. Whether a result of taphonomic processes, poor deposition, or modern site activities, this is true at all depths below surface. This greatly impedes artifact analysis. Pottery at the site is notably the most affected, being already highly fragmentary when initially exposed, and tending to be very friable thereafter. Therefore pottery sherds from the site tend to be small, and the reconstruction or cross-mending of vessels it therefore difficult.

Cross-mending of vessels has not been extensively undertaken. Prior to this analysis this process was contemplated, but it was quickly realized that most vessels are represented by just a few sherds, commonly found together, or in very close proximity. When more distance cross-mends have been found, the artifacts tend to have been separated though historic or modern disturbances, not use-disposal practices. Finally, and most unfortunately, various recording methods have been used to track sherds in the assemblage when previous researchers attempted cross-mending. This has led to the loss of provenience for some sherds which are now amalgamated into vessels. Given these limitations, a proper cross-mending analysis was not undertaken.

Confounding interpretation further is the divisive nature of the excavation blocks. The spatially separate nature of the excavation blocks (as shown in Figure 4) creates disjointed windows into the archaeological record. As a result, the temporal and functional relationships between the excavation areas are not currently known. That is to say, the chronology of the site is not yet fine-grained enough to elicit temporal differences in site use areas, especially since they may evidence multiple annual occupations. In addition, the use of particular areas for certain functions, e.g., acorn processing, would create varying material culture patterns. However, all of the Kitchikewana site analyses thus far undertaken do not investigate site-wide use patterns. Rather they focus on basic descriptions of the assemblages from either annual excavations or summations of block excavations (e.g., the mess hall site) with little reference even to adjacent excavations blocks (e.g., Mortimer 2006; Ross et al. 1990;

Teal et al. 2009). While most excavations and their resultant assemblages have undergone preliminary typological analysis and interpretations, the large collection from the 1992 to 1997 volley ball court mitigations has yet to receive such attention.

Finally, none of the existing analyses from the Kitchikewana site have undertaken detailed attributed based studies. Lithics, both tools and debitage, and pottery have all been summarily types based upon criteria that vary from researcher to researcher and sometimes form year to year. Any formal, site wide analysis requires a re-examination of the assemblage, and likely re-inventory in a consistent manner. Accordingly, this plays a role in this analysis' reliance upon pottery and exclusion of other artifact classes.

Human History of Camp Kitchikewana

Beausoleil Island and the Camp Kitchikewana site demonstrate a long history of occupation. Based upon the recovery of a few diagnostic projectile points, people were visiting the island as early as 3,500 B.C. (Mortimer 2006:22). These occupations were likely during brief periods of a semi-nomadic cycle to collect local resources, such as fish, nuts, and game (Wright 1995:234, 239-240). Of note is that shortly after this time, Beausoleil Island was inundated by the Nipissing Transgression. Accordingly, the next archaeologically visible occupation began in what is commonly called referred to as Middle Woodland period, circa 400 B.C.

Artifacts from the Middle Woodland (400 B.C. to A.D. 1000) and into the early Late Woodland (ca. A.D. 900 to 1800) period, in particular pottery, are found frequently throughout the camp, suggesting longer and more frequent occupations or the presence of larger groups, likely continuing the subsistence and settlement patterns of their predecessors (Mortimer 2006:95; Teal et al. 2009:1). More specifically, Mortimer (2006:95-96) summarizes the Middle Woodland occupation from the mess hall excavations as a warm season multi-purpose encampment including evidence of pottery production, lithic tool reworking, food procurement, and resource processing. Lithic debitage from the site is limited, and suggestive of tool finishing, resharpening, and/or reshaping; not full manufacture. Processing activities are evidenced in the relative abundance of scrapers found in a small in-situ Middle Woodland occupation level.

From the basketball court excavations, Teal et al. (2009:45) found a similar artifact pattern with an abundance of unifacial tools (e.g., scrapers, flake knives) and bipolar objects, with a paucity of bifacial tools, again suggestive of resource processing as a key activity. Teal et al. (2009:45-46) further suggest the main resource processed at the site was likely fish. Food processing seems to be a general theme across the Kitchikewana site, including the discovery of numerous piles of heat altered granite cobble concentrations from possible roasting or rendering pits in the volleyball court excavation area (Ross and D'Annibale 1994:3). Also in this area, and elsewhere are what Ross and D'Annibale refer to as "ghost features", concentrations of fragmented calcined bone (mostly fish and mammal) with no other organics (Ross and D'Annibale 1994:3), possibly the waste from a rendering or roasting operation.

Subsequent Late Woodland period (A.D. 900-1800) occupations at Camp Kitchikewana, while less visible archaeologically than their predecessors, are present. Late Woodland occupations of the Kitchikewana site are perceived through the presence of Pickering and Middleport pottery vessels, a few clay pipes, and a series of early Late Woodland radiocarbon dates, discussed below. Evidence of mast resource processing at the site was uncovered in the volleyball excavation area where two acorn roasting pits were encountered and radiocarbon dated to between A.D. 1370 and 1520 (Ross and D'Annibale 1994:2). Generally though, the quantity of diagnostic Late Woodland material is markedly decreased from the previous occupations, possibly indicative of a changing subsistence and settlement strategy linked to the adoption of farming over foraging. In particular, given Beausoleil Island's proximity to Huronia the expectation might be for a fair quantity of Huron style pottery or other evidence of their use of the island. This is not the case, and there is in fact a general scarcity of what could be identified as 'Huron material' (as per Ramsden 1977, 1990) from Beausoleil Island in general. One might speculate this absence is indeed a function of the farming nature of the Huron people, or of those in the area before them adopting horticulture elsewhere as the sandy or rocky soil of Beausoleil does not lend itself to a horticultural subsistence strategy. Conversely, it could be a reflection of a lack of demonstrable ethnic identity expression though material culture in an area of intense social interactions, thereby obscuring a Huron presence at least in the pottery record.

Archaeologically, the next two centuries of Beausoleil Island's history are unclear. Undoubtedly, an island of this size played some role during the 17th century Jesuit missionary work undertaken throughout Huronia, and subsequently during the expansion of the fur trade and European settlement. Yet evidence of these uses is very sparse. Throughout the camp property, only two definitive 17th century artifacts, a so-called Jesuit Christianisation ring and an axe head, have been found. During the 17th century Beausoleil Island was known to the Huron or Wendat as Schiondekiaria, as it appears on period maps (e.g., De Creux 1684). However, Schiondekiaria is mentioned only once in the Jesuit Relations in reference to De Creux's map (Thwaits 1898:253).

Historic use of the Kitchikewana property was extensive during a ten year period when a small Ojibway reserve village was established here circa 1846, only to be abandoned in 1856 (Mortimer 2006:98-99; 2007). This occupation saw the construction of ten homes with associated outbuildings, semi-subterranean cellars, outhouses, etc., all of which had an impact on the underlying archaeological resources. Post 1856, a few community members remained and homesteaders continued subsistence living or small enterprises on the island shortly thereafter, but the Kitchikewana area became generally unused until the early 1900s.

The YMCA Camp Kitchikewana officially began operating in July 1920 (Bridge 2001:5) and, since that year, the property has been subjected to rigorous and continual use. The YMCA's affect upon the underlying archaeological sites has been considerable, as expected from over 90 years of camp activities. Today, the impact of the YMCA occupation is readily found on the ground and during excavations in the form of displaced and trampled artifacts, and mixed contexts.

Radiocarbon Dates

From 1989 to 2010, 35 wood or floral charcoal samples were collected and sent for radiocarbon analysis. Fifteen of these samples date post A.D. 1650, beyond the period of interest in this analysis. Furthermore they have large ranges (ten are post A.D. 1850 with ranges greater than 100 years) minimizing their value, and are therefore not discussed here. Many dates also post-date the era of interest in this analysis, but they do show a continued use of the site throughout the Late Woodland period, up to the

European contact era. Indeed multiple dates from the post ca. A.D. 1200 have been returned. The radiocarbon dates of possible interest are presented in Table 1, with a comment on the tradition or phase occurring at the same time. One general note is that when multiple dates are present from the same excavation block, e.g., the basketball court (13H29 to 31), the broad range remains the same, suggesting repeated use of the same areas.

Of immediate relevance to this study are the six earliest dates, all from wood charcoal, ranging from cal A.D. 262 to 1170 (noted in bold in Table 1). The earliest, cal A.D. 262 is from the middle of the Middle Woodland period. This date was obtained from carbonized wood associated with a hearth feature of heat altered granite cobbles and darkened soil, with many pottery fragments and quartz chunks (Ross 2007).
The next two dates, cal A.D. 805 and 929 fall into the end of the Middle Woodland period, as defined by Curtis (2004b). The cal A.D. 805 date was from a sample in an undisturbed layer in the basketball court area that contained Middle Woodland pottery (Teal et al. 2009:13). The cal A.D. 929 date, from a unit in the senior septic excavation block, is from a small (40 x 40 cm) simple hearth feature scooped out of the sand about 33 cm below surface (Ross 1994). Unfortunately, there is a discrepancy with the artifacts possibly associated with this date. The artifact inventory and labelling places a vessel, previously determined to be of late Saugeen origin, indirect association with this feature. This vessel is also included in this analysis as number 38. Conversely, the excavator's field notes report that there are no artifacts in this layer (Ross 1994:115-116), so caution must be exercised in blindly accepting the context for this date.

Provenience	Lab Code	^{14}C Years B.P. $\delta^{13}C$ Corrected	Cal Date Range A.D. Years +/- 2σ	p	cal A.D. Years	Period/ Affiliation
13H22A4	S-3265	530±60	1296-1453	1.00	1397	MLW
13H23B6	S-3266	430±90	1312-1358	0.05	1494	MLW
			1387-1653	0.95		
13H21U3	**S-3267**	**860±60**	**1039-1264**	**1.00**	**1170**	**ELW**
13H29P31	**BGS-1587**	**940±70**	**982-1227**	**0.99**	**1102**	**ELW**
			1232-1241	**0.01**		
			1247-1251	**0.00**		
13H30J423	**BGS-1648**	**990±75**	**894-927**	**0.05**	**1059**	**ELW**
			935-1212	**0.95**		
13H30W450	BGS-1651	650±125	1045-1096	0.02	1326	ELW-MLW
			1119-1142	0.01		
			1147-1489	0.96		
			1603-1609	0.00		
13H31R442	**WAT-2865**	**1100±70**	**720-741**	**0.01**	**929**	**PP-Saug**
			769-1044	**0.98**		
			1102-1118	**0.01**		
			1143-1146	**0.00**		
13H31X412	WAT-2867	820±70	1040-1110	0.16	1201	ELW
			1115-1285	0.84		
13H38J521	**BGS-2668**	**1217±45**	**680-895**	**0.98**	**805**	**PP-Saug**
			924-937	**0.02**		
13H43C725	**TO-13590**	**1770±50**	**131-386**	**1.00**	**262**	**PP-Saug**
13H45H334	UCI-68297	630±15	1293-1322	0.39	1357	MLW
			1348-1392	0.61		
13H45A316	UCI-68313	585±15	1311-1359	0.72	1343	MLW
			1387-1408	0.28		

Table 1. Radiocarbon Dates from Camp Kitchikewana

Note: Calibration by CALIB 6.0.3 (Reimer et al. 2009; Struiver and Reimer 1993).
Dates after cal A.D. 1500 are not shown
Samples of most interest shown in bold
ELW = early Late Woodland
MLW = middle Late Woodland
PP = Point Peninsula
Saug = Saugeen

Lastly, the cal A.D. 1059, 1102, and 1170 dates all fall into the early portion of the Late Woodland period as identified in the more southern portion of Ontario. The sample for the first date, cal A.D. 1059, was retrieved approximately 20 cm below surface from a charcoal concentration with scattered heat altered granite cobbles. Associated finds include numerous pottery sherds, chert flakes, hammerstones, a ground stone tool fragment, and a few calcined bone fragments. The excavator, while not providing any interpretation of the feature, does suggest the lithics represent a primary reduction activity area for Huronia pebble chert (Ross 1993:88-92).

Excavation records for the provenience associated with the cal A.D. 1102 dated sample contain no mention of a sample being obtained for analysis, nor any notation of charcoal being present (D'Annibale 1992). This could be excavator oversight, and given that the sample was obtained from the mottled mixed layer that overlies the yellow sand, the context could be poor. Associated finds are limited to a couple of pottery sherds and two lithic flakes. Furthermore, the range of this sample overlaps with the following one and therefore, as explained below, the charcoal may not be of cultural origin.

The final sample of interest was taken from a charred stump or large root found in the senior septic excavation block. The stump was found in a layer of grey mottled sand with no associated artifacts (Ross 1990:94-120). The date returned, cal A.D. 1170 possibly represents the date of a forest fire (Ross 1990:94-120), and is not likely associated with a specific cultural activity at the site; however there has been debate about the use of fire to modify forests during the Late Woodland period by inhabitants practicing agricultural in Southern Ontario (Campbell and McAndrews 1995; Clark and Royall. 1995) and early European settler accounts also record such of fire amongst the

Native populations (Campbell and McAndrews 1995:8). Thus a cultural event cannot be ruled out.

In summary, those radiocarbon dates from the site with good context support the initial typological style-based pottery interpretations; the site has a Middle Woodland component and a component from the transitional time between the Middle and Late Woodland periods. Unfortunately, none of the radiocarbon samples were obtained from contexts with direct associations to any of the pottery vessels used in this analysis.

Comparative Assemblages

Throughout this analysis references and comparisons are made to other Ontario Middle Woodland archaeological assemblages. While the comparative collection is by no means exhaustive, it represents readily available published data on larger Middle Woodland pottery assemblages from both the Saugeen and Point Peninsula traditions. Selection of comparative assemblages was based upon a loose set of criteria, including publication of site data, presence of multiple vessels, an acknowledged affiliation to a pottery tradition, and most importantly, the study must have some form of attribute-based analysis or descriptions that allow association to the variables used in this analysis. From these criteria and a literature search, the following sites/components were selected (Table 2). Location data is provided in Figure 5 and site date ranges, shown in Figure 6, are adapted from Curtis (2004b), with Smith's (1997) reassessment of radiocarbon dates.

Limitations of the comparative collection include geographic and, chronologic distributions, site depositions, and site occupation types. Firstly, the broad geographic distribution of the sites, and the great distance they are from the Camp Kitchikewana

Site/Component	Abbreviation	Map #	Tradition	Phase	Sources
Auda	Auda	1	Point Peninsula	Sandbanks	Curtis 2004b
Donaldson	WDON or DON	2	Saugeen		Wright and Anderson 1963, Finlayson 1977
East Sugar Island Ash	ESI A	3	Point Peninsula	Sandbanks	Curtis 2004b
East Sugar Island Black	ESI B	3	Point Peninsula	Trent	Curtis 2004b
East Sugar Island Shell	ESI S	3	Point Peninsula	Rice Lake	Curtis 2004b
East Sugar Island Sod and Loam	ESI L	3	Point Peninsula	Sandbanks	Curtis 2004b
Inverhuron Lucas	IHL	4	Saugeen		Anderson 1962; Finlayson 1977; Kenyon 1959; Lee 1960b; and summarized in Wright and Anderson 1963
Kant	Kant	5	Point Peninsula	Ottawa	Daechsel 1981, Emerson 1955
Lakeshore Lodge	LL	6	Point Peninsula	Sandbanks	Curtis 2004b
Log Cabin Point Hearths	LCP H	7	Point Peninsula	Sandbanks	Curtis 2004b
Log Cabin Point Layer 4	LCP 4	7	Point Peninsula	Trent	Curtis 2004b
Richardson	RICH	8	Late Woodland	Early Ontario Iroquois	Curtis 2004b
Sawdust Bay-2	SDB2	9	Point Peninsula	Ottawa	Daechsel 1981
Serpent Mounds	SM	10	Point Peninsula	Rice Lake	Curtis 2004b, Johnston 1968
Spillsbury Bay Layer 1-1a	SPB 1	11	Point Peninsula	Sandbanks	Curtis 2004b
Thede	Thede	12	Saugeen		Finlayson 1977
Baxter	Baxter	13	Point Peninsula?	Early	Dodd and Lennox 1996

Table 2. Comparative Assemblages

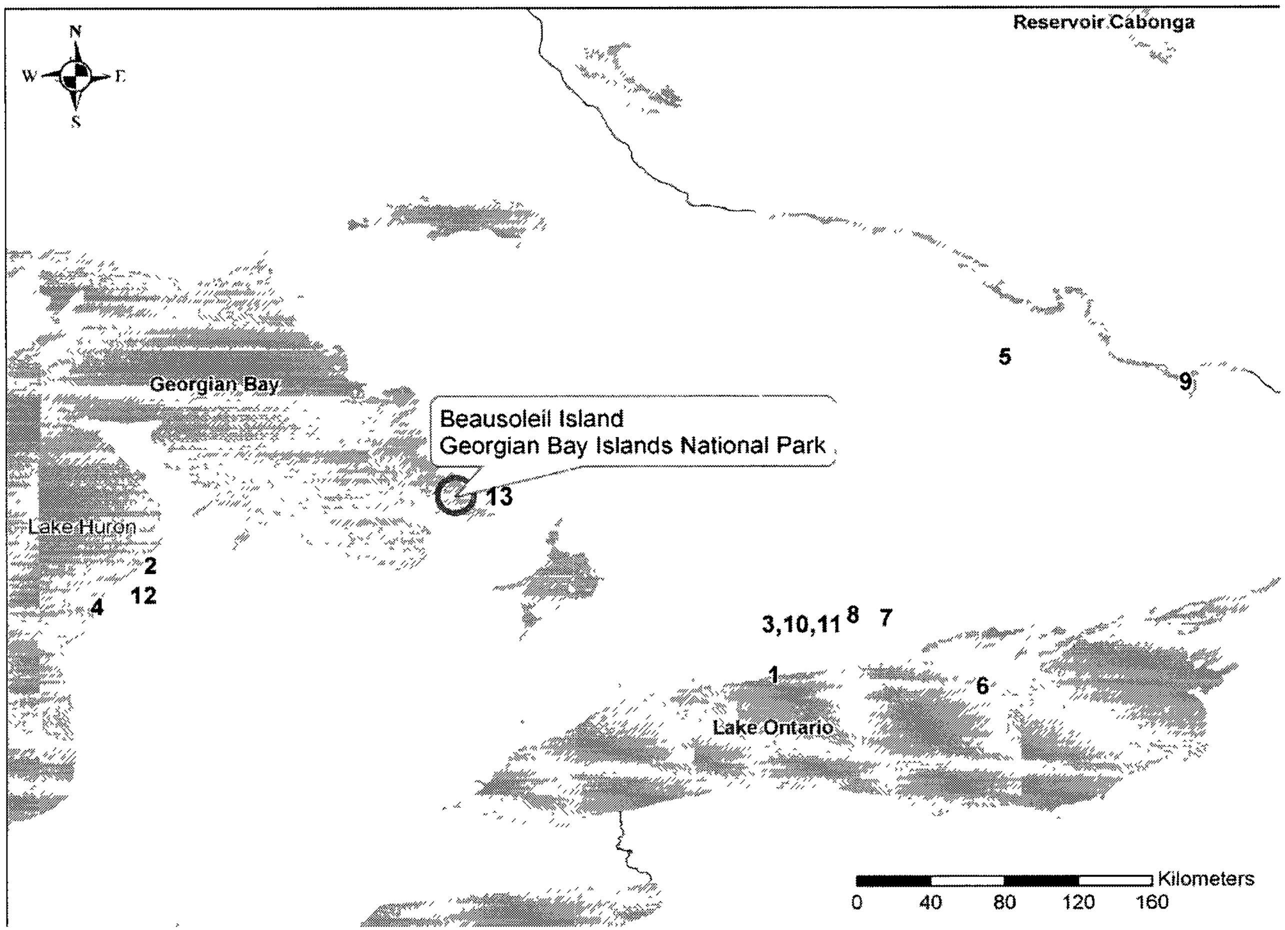


Figure 5. Location of Comparative Assemblages

Note: See Table 2 for site names

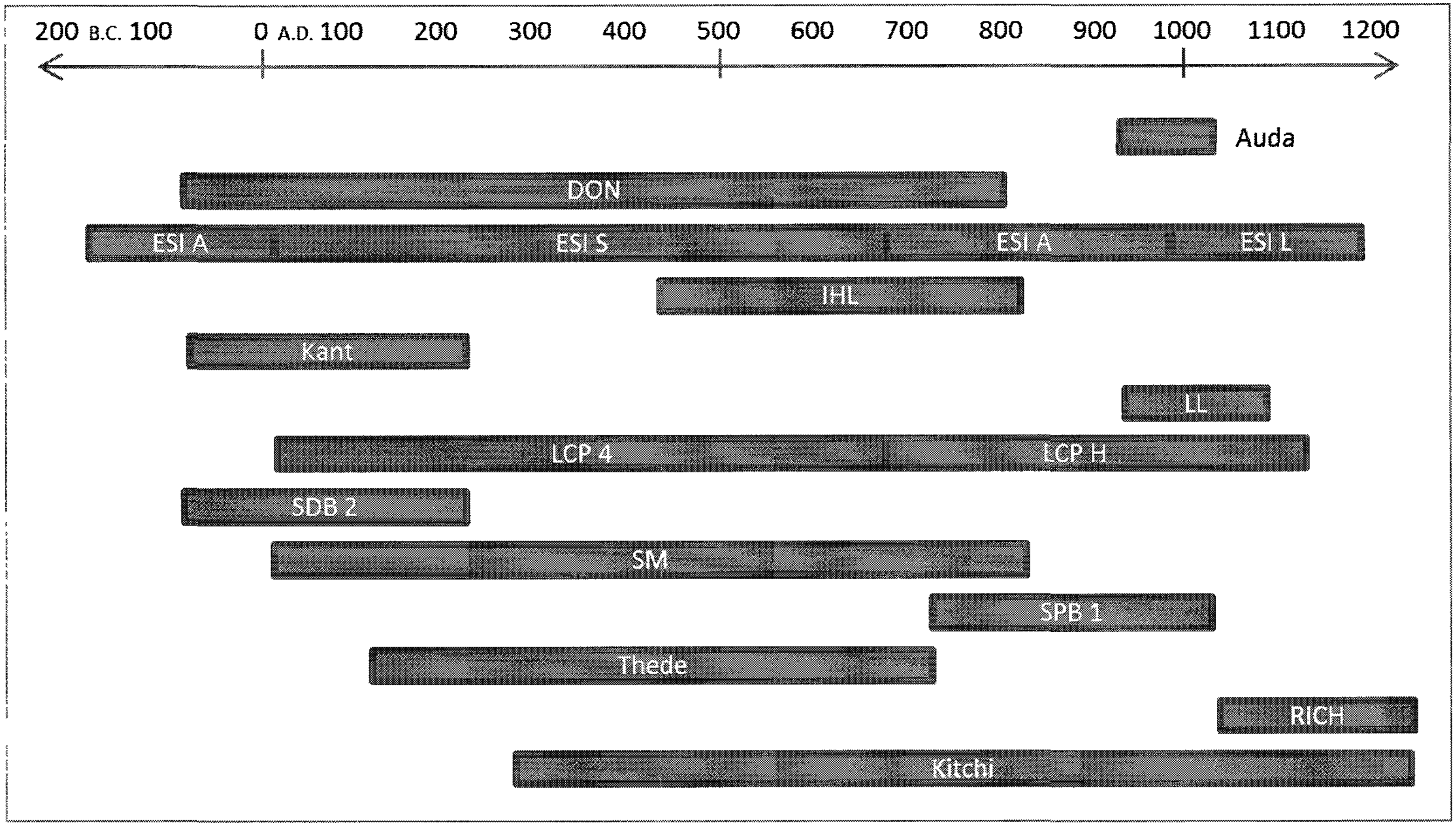


Figure 6. Timeline of Comparative Assemblages (adapted from Curtis 2004b:140 Figure 5.2)

*Note:*The timeline is not a detailed accurate chronologial device; rather it is simply a general depiction of the sequence of sites and components. For an explaination of the abbreviations see Table 2.

site, introduces unquantifiable geographic variation. Unfortunately, no sites meeting the above criteria from the southern Georgian Bay area were known to me at the outset of this analysis. After the statistical analysis was complete, Dodd and Lennox's (1996) report on the Baxter, Bentley and Bressette Sites, just west of Port Severn, was brought to my attention. While not included in the statistical analysis of this study, the characteristics of the Baxter site pottery, the only site in the study with a reasonable sample size, are referenced in the discussions.

Temporally, the comparative sites encompass different occupation periods, and all exhibit long-term use. Many are in fact amalgams of recurrent site use over long periods. For example the calibrated radiocarbon date range for the Donaldson site is from 770 B.C. to A.D. 650 (Smith 1997:Table 2). Thus it is a multi-component site with the Saugeen Middle Woodland element not appearing until circa 100 B.C. and pottery from recurrent occupations are mingled. As Wright (1999b:731) notes, multi-component sites with collapsed or non-existent stratigraphy are common on archaeological sites in the region.

The type of site occupation also differs within the comparative sample, and thus could influence pottery styles or construction techniques. For example, pottery recovered from a mortuary sites such as Serpent Mounds, may exhibit more finely made ceremonial pottery versus pots used in a resource processing role at another site.

These hindrances are acknowledged, however they are common limitations to the archaeological record of Ontario, in particular in regions where investigations are more limited and stratified deposits rare, i.e., on the Shield and its' surrounding area.

Accordingly, archaeologists must make do with what we have while being forthright about the limitations of assemblages.

CHAPTER 4: OF VESSELS AND RIMS (METHODOLOGY)

The following chapter details the methods followed in this analysis. To reiterate, the succeeding process is undertaken to address the primary question "Why is there variability in the Middle Woodland Kitchikewana pottery assemblage?" To begin answering this question, a method for summarizing the Middle Woodland pottery assemblage is required. The characteristics of the assemblage are summarized though a frequency distribution of attributes, simplified with the use of statistically significant variable combinations. Since attribute analysis is chosen as the underlying philosophy upon which all other analyses and conclusions in this study are based, a brief introduction and justification for the use of attribute analysis in pottery studies is presented. The nature and technique used to generate the sample population is detailed, followed by the selection and description of variables for the attribute analysis. Lastly, the statistical methods for the diversity and cluster analyses are presented and justified.

Type vs. Attribute

Pottery vessels are commonly held to be highly susceptible to changes in economy, culture, society, politics, temporal drift, conformity biases, and modes of production, compounded with modifications brought through temporal or external stimulus, and idiosyncratic behaviours (Kohler et al. 2004; Michelaki 2007:151; Neiman 1995:9-10; Shennan and Steele 1999). Transformations can occur in many different characteristics of the vessels: shape, decoration, construction technique, etc. In the past, archaeologists used these characteristics to create pottery types.

The typological method for Eastern Woodland pottery is based on the work of Ritchie and MacNeish (1949), who created 'types' of pottery based upon the overall similarity of objects. They perceived that these types represented the normative stylistic concepts of the pottery manufacturers (1949:98). Each type is characterized by particular aspects of manufacture, form, and decorative style, forming what they saw as exclusive categories. These traits were considered culturally and chronologically sensitive and the categories were then used to classify pottery from different sites and components. Subsequently, these components were seriated based upon the frequencies of the types, and a sequence was generated (Ritchie and MacNeish 1949). Applications of this technique, while promising, eventually highlighted a fundamental flaw. The pottery types were truly subjective constructs and the nature of pottery variation forced researchers to either ‘lump’ their pottery into existing categories of best-fit (thus ignoring potentially important deviation), or to ‘split’ and create new types (possibly over emphasizing dissimilarity). Even statistically generated types, like those of Spaulding (1953), as Ford and Steward (Ford 1954; Ford and Steward 1954) aptly argue, do not correlate to human behavioural patterns. Thus the typological method in the reconstruction of cultural chronologies and distributions “encourages insular sequences, favours diversity, and rewards the creation of new taxa where such designations are not necessarily warranted” (Watts 1999:37). The typological method is unable to adequately handle the continuum of variation exhibited by pottery styles, nor does it begin to elucidate human behaviour.

Wright (1966) employed a new method combining types with attribute analysis. Each of the characteristics of the type is composed of a set of attributes. Attributes are the smallest division of the vessels and can be seen as things such as the tool used for decoration, the method of applying the tool used for decoration, etc. Mutually exclusive, attributes can be recorded objectively and in detail. Attribute-based analyses eliminate the necessity to lump or split as they are formulated at the "smallest unit of analysis applicable to ceramics" (Curtis 2004b:58). Recording of attributes is objective and they can be either quantitative (e.g., rim thickness) or qualitative (e.g., dentate stamping) and the data can be in any scale (nominal, ordinal, interval or ratio). Attribute based analysis in Ontario developed from Wright's (1966) approach. In his *The Laurel Tradition and the Middle Woodland Period* (1967), Wright purposely avoids the use of the defined types and uses attribute-based coefficients of similarity between site components to ultimately generate a frequency seriation of the components. The drawback to attribute based analysis is the volume of data necessitated by such a fine grained technique, yet such resolution allows for small pattern changes to be noted and interpreted (Curtis 2004b:58; Wright 1967:3). These changes are considered to be representative of cultural change. Further refinement of the method can lead to groupings of objects based on the frequency at which different attributes are found in combination, thereby reducing the data and "allowing the identification of the exact characteristics of each assemblage" (Curtis 2004b:59). Thus, attribute analysis provides an enhanced level of scrutiny which is sensitive to interaction and relationship patterns (Curtis 2004b:58; Engelbrecht 1980; Ramsden 1977; Wright 1980) and it is therefore used for this analysis.

General Assemblage

The Kitchikewana pottery assemblage is large and diverse. As of February 2008, there were 36,527 pottery sherds inventoried in three Parks Canada databases. The general make-up of this assemblage is presented in Table 3. This tally represents all ceramics from the site and does not distinguish between occupations, i.e., Late Woodland and Early Woodland pottery. Notably, a large portion (48 percent) of the.

Sherd	Total	%
Unspecified Rim	2	<.1
Decorated Base	4	<.1
Undecorated Neck	30	.1
Undecorated Rim	86	.2
Undecorated Base	99	.3
Decorated Neck	126	.3
Unspecified Sherdlet	213	.6
Unidentified	361	1.0
Unspecified Body	598	1.6
Decorated Sherdlet	1258	3.4
Decorated Rim	2612	7.2
Decorated Body	5289	14.5
Undecorated Body	9648	26.4
Undecorated Sherdlet	16201	44.4
Total	36527	100.0

Table 3. Camp Kitchikewana Pottery Tally, Decorated vs. Undecorated Sherds

assemblage is composed of sherdlets, defined here as pieces of pottery less than 1 x 1 cm in size

Nature of the Sample

For this analysis, the minimum unit is the vessel and thus the first step was to determine accurately the individual vessels. Northeastern Woodland pottery follows a general decorative style whereby the decoration (if present) is either in horizontal bands of similar decorative style encircling the vessel and/or is often done with the same tool all over the vessel. Temper type is also uniform throughout a single vessel. Uniformity in the temper of a vessel occurs because the clay mixture must be homogeneous, in terms of water and temper, otherwise warping and cracking are likely to occur during drying or firing due to moisture differentials (Rice 1987:67). Thus decorative tool, decorative configuration, temper type, and rim/lip form supply four good criteria for visually identifying individual vessels.

To isolate the different vessels, the entire collection of 36,527 sherds (the complete collection from the site up to, and including, the 2008 excavations) was examined and all identifiable rim fragments and larger decorated body sherds were amassed (approximately 2,000 sherds). The remaining ~34,500 sherds cannot be accurately correlated to particular vessels because they share common attributes with multiple vessels and tend to be, as with most of the pottery from this site, highly friable small pieces. Furthermore, as discussed in Chapter Three, the jumbled nature of the Kitchikewana archaeological deposits also limits vessel sorting based upon provenience.

The assembled rims and larger body sherds were next separated into broad groups based on the primary decorative tool used (pseudo-scallop shell, dentate, cord, plain, or other). Within the decorative tool groups, each sherd was compared to all of the others on the basis of temper type, decorative tool size and shape, configuration of decoration, and rim/lip form. If two sherds had commonalities in all of these categories, they were lumped together as a single vessel; if they did not, they became unique vessels. Through this process, a minimum of 135 unique vessels were identified in the Camp Kitchikewana assemblage. The vessels are not all of the same analytical quality; composition of the assemblage ranges widely, from a few vessels being nearly complete to others that are present as merely small fragments of vessel rims. Those vessels represented by sherds too small to be of diagnostic use in this analysis were removed via the following sampling strategy.

Generation of the Sample

Sampling of the population of 135 vessels was driven by the variables selected as the basis for the attribute analysis. That is to say, for inclusion in the study each vessel needs all of the variables present. The criteria for inclusion are thus: the presence of both interior and exterior surfaces, a minimum rim arc length of 5 cm, and a minimum rim height of 2 cm OR the presence of the first two decorative bands. This sampling strategy selected 67 vessels for inclusion and eliminated 68 vessels.

Given the aforementioned lack of stratigraphic control and the multi-component nature of the site, further limitations were set on the sample population due to the inherent characteristic of cluster analysis whereby it cannot account for single, principal variables. That is to say that cluster analysis (described in detail below) cannot isolate a previously known cluster (i.e., Late Woodland pottery) that can be identified based upon the presence of a single, notable trait. Examples of such traits include prominent castellations and the presence of collars, which are typically Late Woodland attributes (Curtis 2004a:48-54; 2004b:229). Removal of these vessels prior to clustering is therefore mandatory, as the statistical analysis will not isolate these vessels on the basis of that single attribute and thus would skew the resulting cluster to which they were assigned. To ensure that the pottery under study is likely to have originated from a similar archaeological period, the vessels identifiable as middle to late Late Woodland (those with prominent castellations, collars, or recognized as Late Woodland types as per MacNeish [1952]) are removed from consideration prior to clustering. This reduces the sample to a final tally of 57 vessels.

The 33 variables examined – comprising 198 attribute states – were largely drawn from Curtis' dissertation, *Process of Cultural Change* (2004b), and, following Curtis, were ultimately generated from Smith's *Northeast Woodland Pottery Analytic Code* (Smith 2005). The attributes under study fall into three categories: decoration, shape, and manufacture. All the attributes for the 57 vessels were recorded into a Microsoft Access 2003 database created specifically for this analysis. General, overall assemblage information (i.e., sherd tallies) was generated from Parks Canada's artifact databases (Informatics 2002, 2003).

Sample Issues

There are many potential issues with the sample selected for this analysis. Firstly, the sample for analysis is very limited with just 57 vessels. As with all archaeological samples there is no way to gage how representative this sample is of the overall population. Furthermore, given the fragmentary nature of the pottery from the site, many vessels are not included in the analysis. They have not been included as many are identified by single, small rim sherds that exhibit few attributes used in the following analysis. While some statistical procedures can cope with missing attributes, or can predict missing ones, it was initially decided that the 57 vessels with all attributes available were sufficient. However, this could be reconsidered given the temporal breadth of the site. As such, these 57 vessels end up representing 1000 years of occupation. Accordingly, this small sample may not represent the true diversity of pottery from the site for that length of time.

Secondly, and again relating to representativeness, is the bias of rim sherd based vessel counts. Simply put, using rim sherds as the only element diagnostic of vessel individuality is misleading by under representing vessels at the site. Under representing can occur because the rim is a small portion of a vessel, and the survivability in the archaeological record, though to inventory, is less likely than that of the multitude of body sherds from that same vessel.

In Chapter Three, the divisive nature of the excavations was mentioned. The Kitchikewana archaeological site has been excavated in, and the vessels retrieved from, four discontinuous blocks, as shown in Figure 7. The relationship between the archaeological deposits recovered from these blocks is not clearly known, though it is assumed that the site is a continuous sub-surface deposit. Regardless, the four excavation blocks may correspond to slightly different eras of occupation, social groups at the site, activity areas, etc. introducing unquantifiable spatial diversity to the sample. Unfortunately, the spatial distribution of the vessels in this analysis has not yet been investigated, but could help reveal some aspects of the different site areas.

Lastly, the poor depositional context must be reiterated. Most deposits at the site are mixed, thus there is no relative stratigraphic dating available to help separate the 57 vessels. Stylistic attributes or the few radiocarbon dates from known contexts are all that remain to add chronology to the sample, but are insufficient.

Description of Variables

Variables in this analysis, as previously mentioned, fall into three basic categories: stylistic, shape, and technological. All of the variables are derived from Curtis (2004b) and/or Smith (2005), and are variables commonly used in many pottery studies (Chilton 1998; Daechsel 1981; Finlayson 1977; Goodby 1998; MacNeish 1952; Ritchie and MacNeish 1949; Wright 1966, 1967; Wright and Daechsel 1993). This

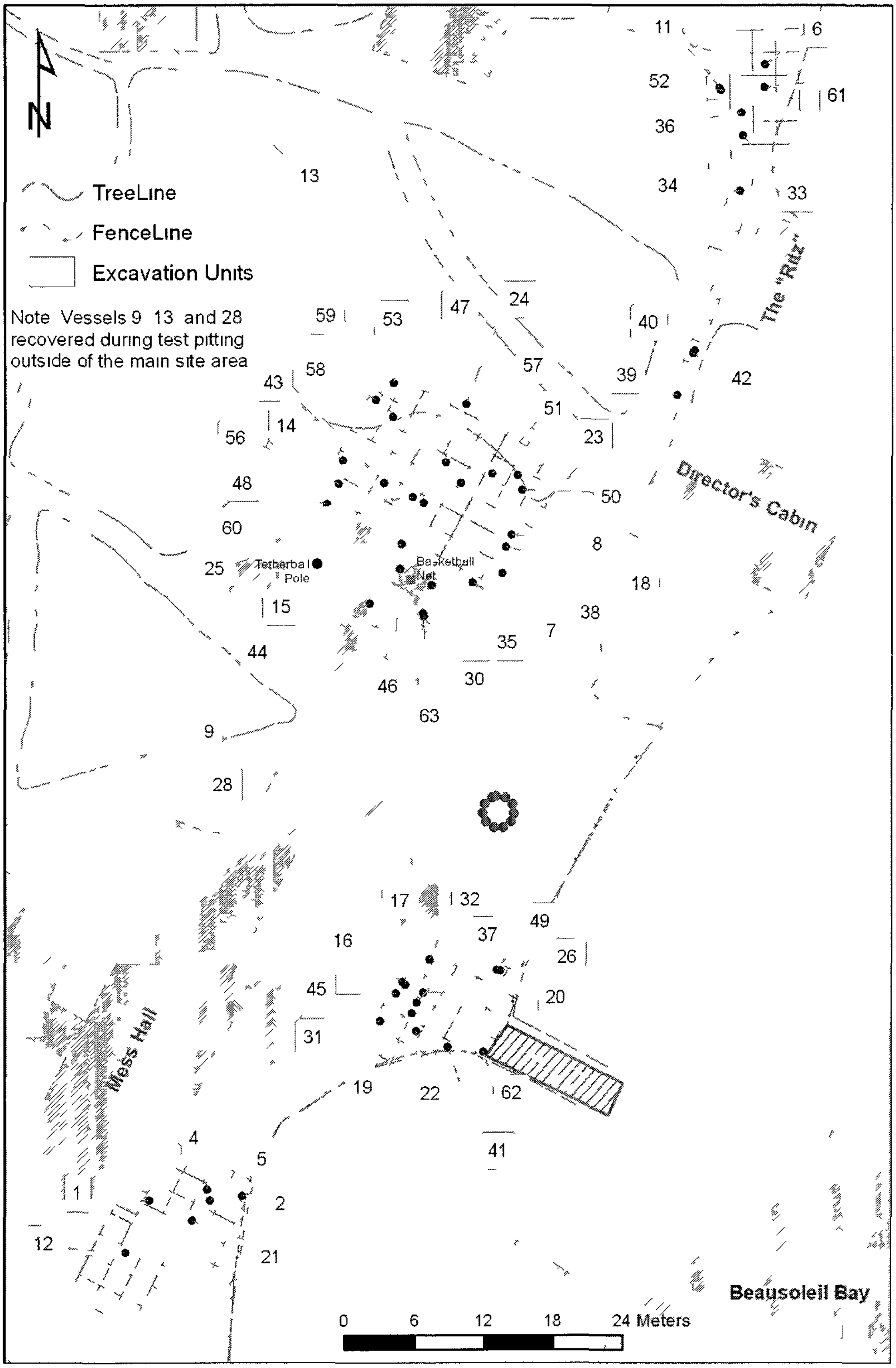


Figure 7. Location of Vessels in the Sample by Vessel Number

analysis includes both stylistic and technological choice attributes (i.e., decoration style and manufacturing data). Inclusion of both is based on two factors, one being the longstanding tradition of identifying Woodland pottery by stylistic qualities and therefore is an attempt to maintain correlation with past studies (see those noted above). The second factor is that technological choice attributes represent another avenue of pottery research, not apart from style and function, but incorporating these into the analysis of choice process that often subconsciously occurs during the creation of an object (Chilton 1998).

> Moreover, archaeologists should not merely be concerned with the identification of styles that were involved in the conscious expression of ethnicity, but with the makeup of entire assemblages of material culture in different spatial and temporal contexts, which may provide information about the social relations and cultural practices underlying the generation of transient, but repeated, expressions of ethnicity (Jones 1997:135).

It is the subconscious sequence of how an object is created, as opposed to the finished look of an object, which may better represent societal behavioural patterns; patterns that may be markers of certain social groups. Inclusion of manufacturing choices (e.g., temper type) is therefore very important to this analysis.

Stylistic Variables. Delimiters are a portion of the stylistic choice and are elements used to amplify either exterior decorative bands (e.g., bordering decorative bands or signifying a change in orientation or tool) or changes in shape (e.g., the transition from the neck to the shoulder). Two types of delimitation occur, either form modification or surface modification. Form delimiters are those which alter the shape of the vessel (punctates or bosses). Surface delimiters are limited to modifications to only the surface of the vessel (blank spaces, incised vertical or horizontal lines).

Four zones of decoration are used in this analysis: first and second exterior decorative bands (first exterior decorative band and second exterior decorative band respectively), lips, and interiors. Decoration for each of the four areas is noted through the variables of tool, technique, and configuration. Decorative tool type (Table 4) refers to the shape of the tool used in creating the decoration within the decorative band.

Tool Type	Description
Annular	A circular implement with a hollow centre, such a piece of bird bone.
Cord	A piece of cord
Crescent	A crescent shaped implement
Cord wrapped stick	A piece of cord wrapped around a stick or other object
Dentate	A repeated notched tool producing a row of teeth
Linear	A straight and smooth sided implement
Plain	No decorative tool is used
Pointed	A pointed implement
Pseudo-scallop shell	An alternately notched tool resulting in a wavy line impression

Table 4. Decorative Tool Type

Decorative technique (Table 5) records the motion used in applying the tool and can vary within the band. Lastly, decorative configuration (Figure 8) notes the resulting pattern or motif within the band.

Shape Variables. The variables encompassing shape in this analysis apply only to the uppermost portion of the vessel. While examination of overall vessel form is preferred, and indeed would add valuable detail to the study, only a couple of the vessels have sufficient sherds present to discern the form. Shape is recorded in six variables: lip form, interior to exterior rim wall relationship (in profile), rim profile for the interior and

Technique	Description
Drag-stamped	The tool or implement is dragged across the vessel – impressed slightly – dragged – impressed slightly, etc. The result is a ribbon-like line.
Incised	The tool or implement is pulled across the surface in a continuous motion.
Plain	No decorative tool was used, therefore no technique is present.
Rocker-stamped	The tool or implement is impressed into the clay from one end to the other in a rolling motion for example, from top to bottom. As the limit of the rocking motion is reached, and the top of the tool, in this example, is lifted, it is "walked" slightly to the side. The resulting impressions form a curved zig-zag.
Stamped	The tool or implement is pressed straight into the clay and then removed.

Table 5. Decorative Technique

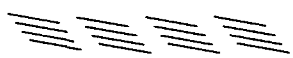
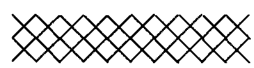
Configuration	Description
Diamonds	◊◊◊◊◊◊◊◊
Horizontal	≡≡≡≡≡≡≡≡≡
Horizontal Difference	≡≡≡//////≡≡≡
Oblique Left	\\\\\\\\
Oblique Right	////////
Plain	Vessel is entirely plain
Plaits	
Superimposed	
Vertical	
No decorative band	This band is plain but another is not.
Zig-Zag	/\/\/\/\/\/\/\/\/\/
Punctates	. . . .

Figure 8. Decorative Configurations

exterior surfaces, rim orientation, and the nature of castellations. Lip form refers to the shape of the lip, as shown in Figure 9.

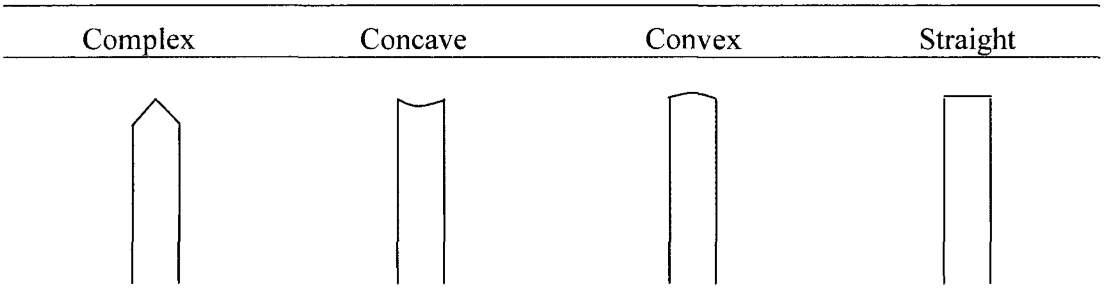


Figure 9. Lip Form

The interior to exterior wall relationship notes if the walls of the rim, approaching the lip, are parallel, converging, diverging, or a thickened lip is present. Interior and exterior rim profiles are recorded as concave, convex, or straight. Orientation of the rim, relative to the vessel body, is recorded as shown in Figure 10.

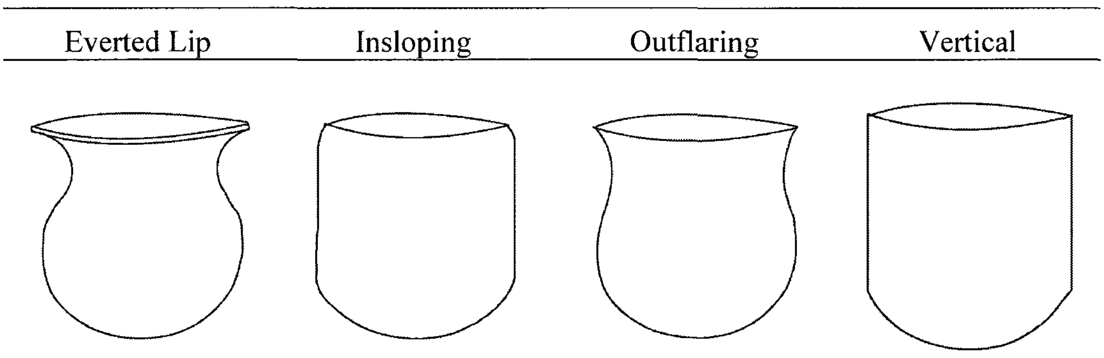


Figure 10. Orientation of Rim

Lastly, the presence of incipient castellations is noted. Castellations, small upward projections on the lip of a vessel, first appear in Ontario in the Middle Woodland period, but are quite rare and tend to be less developed than later examples (Curtis 2004a:51-52). Castellations are not clearly understood, and may reflect stylistic and/or technological aspects of a vessel (see Curtis 2004a:46 for a synopsis of these varying ideas). While Curtis rejects the use of "incipient" as a type of castellation for typological reasons, the term is still used here in a subjective sense to refer to castellations which are not well defined. As previously noted, all other castellated vessels are removed from the statistical analysis as prominent castellations are a well-documented Late Woodland trait (Curtis 2004a; MacNeish 1952; Trigger 1986:94).

Technological Variables. Technological variables are those which may have influenced the performance or use-related characteristics of a vessel and were likely chosen based on a subconscious pattern or societal practice of the "recipe" for creating a pot. The "performance" of a vessel refers to its ability to withstand the everyday forces of use, be it over a hot fire for a short period or long slow heating; carrying water or storing dry goods; or simply surviving the ordeal of drying, firing, and cooling. The most significant technological choice in the creation of a pot is which raw clay to use, as this effects mechanical stress resistance the most (Rice 1987:226). However, ethnographic studies find there is a tendency for potters to gather clay within 1 km, out to at most 7 km from their settlement (Arnold 1985:34-35). In a semi-sedentary society, or one with regular water transport, this threshold could be larger, especially given the possibility of procurement associated with other distance resource collection, familial, or ceremonial visits (Fie 2008:28). Thus, clays tend to be selected based on proximity and then modified to suit the intended use through altering temper, consistency, thickness, etc. (Rice 1987:227). Consequently, temper, construction technique, consistency, surface treatment, and general metric attributes of vessel size are the resulting variables capturing the major technological selection processes in pot formation.

Temper is divided into three variables: type, quantity, and size. Eight different types of temper material (Table 6) were visually identified with a 10x magnification loupe. However, these are macro-visual classifications are not specifically identified as specific minerals or rock types (i.e., feldspar, granite, and quartz), because this would require thin-section analysis for proper recognition. Regardless, the Kitchikewana pottery assemblage exhibits noticeably different grit tempers from sherd to sherd and vessel to vessel. To capture this trait, the fine grained division of temper materials was considered necessary.

Type	Description/Appearance
Grit 1	Cleavage in two directions at 90°. Colour varies from white to pink. Tabular shaped. Possibly feldspathic.
Grit 2	Grey and non-lustrous. Possibly limestone.
Grit 3	Pink in colour. Differs from Grit 1 in its multiple cleavage planes and visibility of different types of minerals, i.e., variable colours. Likely granite.
Grit 4	Thin, sheet-like pieces which are brown to black and lustrous. Likely mica.
Grit 5	White to clear with multiple or conchoidal cleavages.
Grit 6	Dark grey, fine grained material with thin layers and irregular, curving fractures. Possibly shale.
Organic	Small holes in the surface of the pottery where organics were burned out during firing.
Pottery	Inclusion of previously fired, then crushed, pottery. Brown and relatively soft.

Table 6. Temper Types

Temper quantity was observed on fractures and exfoliated surfaces using comparison charts for the visual estimation of coarse fragments (as per Terry and Chilingar 1955). This method divides the vessels based on the percent of the pottery comprised of temper into four categories (Table 7). No attempt was made to identify the ratio of specific temper types in vessels with combined temper; rather the overall temper quantity was noted. For the variable of size, ten temper particles from fractured or exfoliated surfaces were arbitrarily selected by the researcher to attempt to cover the breadth of sizes visible. Each was measured along the longest available axis with digital callipers and the average temper size calculated in millimeters. Preferably, fragments from each vessel would have been pulverized to accurately measure all temper particles to gain more accurate average, however destructive analysis such as this is neither generally acceptable (requiring a consultation process with Georgian Bay Islands National Parks Cultural Advisory Council) nor practical because some vessel are represented by only a few sherds.

Category	% of Volume
Small	0-3
Medium	5-10
Large	15-25
X-Large	>25

Table 7. Temper Quantities

The presence of coil breaks is noted for each vessel. Coil breaks correspond to the coiling method of pot forming, prominent for Middle Woodland pottery traditions (Spence et al. 1990). Coiling was slowly replaced by the modeled or paddle-and-anvil method with the transition to the Late Woodland and has been held as a valuable chronological indicator (Curtis 2004b:66). Recent chronologically sensitive analysis of New York state pottery manufacturing technology by Hart and Brumbach (2009) demonstrates this shift is a long term process with considerable overlap of the two forming techniques. Coil breaks tend to only appear on vessels where the coils were not adequately melded together before drying (Rice 1987:128), and do not necessarily appear on all coiled vessels. Consequently, the presence of coil breaks indicates coil manufacture and an origin likely during the Middle Woodland period, but the absence of coil breaks does not eliminate coil manufacture nor does it automatically signify modeling. The presence of coiling was not used as a variable in the cluster analysis as it could skew the correlations, creating similarities between vessels exhibiting coiling, and more importantly, falsely adding to dissimilarity between vessels that may be coiled but not exhibit that trait (as noted above) and those obviously coiled.

How well a vessel has held together is indicated by the variable 'consistency'. Consistency is divided into five somewhat subjective categories (Table 8), as per Curtis (2004b:66), based on a visual examination of the vessel.

Consistency	Description
Well-Knit	Even textured paste, no cracking
Laminated	Fine cracks parallel to surfaces, likely to have exfoliated
Intermediate	Few cracks, integrity of the paste remains
Chunky	Likely to break into big pieces
Crumbly	Likely to break into small particles

Table 8. Consistency of the Fabric

After a period of drying, and before firing, vessels can undergo different finishing procedures altering the form and/or surface of the vessel, and therefore the performance characteristics of that vessel (Rice 1987:136-141). Finishing procedures are classified under surface modification (Table 9), and are recorded for the vessel's rim and

Technique	Description
Combed	A toothed tool (e.g., a dentate tool) is drawn across the surface resulting in a striated pattern of parallel lines. Also known as channelling.
Indeterminate	Unrecognized surface modification
Smoothed	Vessel is re-wet and the surface is smoothed using a soft tool, like grass or the hand (Rice 1987:138)
Textured	A roughened surface resulting from cordage, fabric, etc. impressions.
Wiped	Faint lines or striations across the surface, between combed and smoothed in appearance.
Superimposed	A combination of two of the above techniques.

Table 9. Surface Modification

body on both the exterior and interior surfaces. These modifications can serve various functions, such as thinning vessel walls through combing, or texturing exterior surfaces for better grip or to increase surface area resulting in better heat transfer (Rice 1987:138).

Surface modification is different from decoration in that it was completed before decorating, and was typically applied to the entire vessel, although the technique can vary from portion to portion. In addition to these tactile surface modifications, the presence of an ochre wash on the vessel was also recorded. Ochre washes are noted by some researchers as a rare indicator of Point Peninsula (Spence et al. 1990:158; Wright 1999b:633), or possibly Laurel (Wright 1999b:633), affiliation. However, the absence or presence of an ochre wash will not, in this analysis, be considered definitive evidence of affiliation to a pottery tradition. This is a result of a literature survey that failed to find empirical support for ochre washing as an exclusively non-Saugeen trait. References to ochre washing are rare and all seem to point back to Wright's volume on the Laurel Tradition where he accounts for multiple ochre washed vessels along the northern shore of Lake Superior, in particular from the Heron Bay site (1967:11-17). Furthermore, it is apparently an absence of ochre washing from the limited number of known and documented Saugeen sites that seems to be at the foundation of this premise, and indeed the correlation may be a false one based on a lack of looking for such a surface treatment during the analysis of the Saugeen site data. Given its rarity, and presently unverified correlation to pottery traditions, the variable of ochre wash was not weighted in the cluster analysis (eliminating it from this phase of the study), but is discussed while attempting to identify the resulting clusters.

To better understand the overall size of the vessels, and potentially their capacity, four metric dimensions of each vessel were recorded: body thickness, lip thickness, rim thickness, and rim diameter. Body thickness is derived from an average of five measurements obtained from more than 2 cm below the rim. Lip thickness is based on a single measurement. This was deemed significantly accurate for lips because there appears to be little variability in thickness around the circumference of the vessels Furthemore, the rim sections used in this analysis are relatively small, presenting a limited lip area in which the measurements could be taken. Rim thickness is again a single measurement and is from 2 cm below the lip. Rim diameter was measured on a diameter chart and may be the most inaccurate attribute as the diameter can be greatly affected by the angle at which the rim sherd is held in relation to the chart. All efforts were taken to ensure the angle represented the original stance of the vessel, but the smaller the overall size of the sherd, the less accurate the diameter measurement will likely be. Consequently, to eliminate some of this inaccuracy the diameter interval data was converted to an ordinal scale (as per Podani 2005) as shown in Table 10.

Size	Rim Diameter Range
Extra Small	100 to 149 mm
Small	150 to 199 mm
Medium	200 to 249 mm
Large	250 to 299 mm
Extra Large	300 to 349 mm

Table 10. Rim Diameter

Statistical Procedures

Attribute analysis was applied in this study for multiple purposes and the basic statistical procedure undertaken in this analysis is as follows:

1. Frequency distribution of attributes for the entire assemblage including the creation of variable combinations
2. Analysis of the diversity of the Kitchikewana assemblage
3. Cluster analyses
4. Frequency distribution of attributes and variable combinations within clusters
5. Statistical associations between cluster membership and attributes and variable combinations

By completing this process, the Kitchikewana assemblage and its diversity is examined as part of a larger cultural picture and the nature of regional similarities or differences in pottery during the Middle Woodland period are elucidated. Each of the statistical methods involved in this analysis are explained and justified below.

Frequency Distribution of Attributes and Variable Combinations

Initial description of the Kitchikewana pottery assemblage was undertaken via an examination of the frequencies of specific attributes (all frequencies were generated using SPSS 17 and are reported in Appendix A: Attribute Frequencies). Frequency distribution is a common and well known procedure in pottery studies (see for example: Curtis 2004b; Daechsel 1981; Gates St-Pierre 2001a; MacNeish 1952; Ritchie and MacNeish 1949; Wright 1967; Wright and Daechsel 1993). This method allows for the salient characteristics of the assemblage to be noted, however, it does not bring to light co-variance of attribute states (e.g., decorative tool type and technique type), nor does it identify any groupings within the assemblage.

By determining if pairs of variables are likely to co-vary, these pairings can be combined in further discussions. For example, if decorative tool is generally covariant with decorative technique, then it is useful to explore the combination rather than the isolated attribute. For example, dentate tool is popular, and stamping technique is popular, but do these two attributes change together? If they do co-vary, this allows the reduction in the discussions to decorative tool AND technique or, from the aforementioned example "dentate stamped". Reducing the variables helps to highlight salient characteristics that might otherwise be lost in a cacophony of background attribute noise. This is a process that Curtis (2004b) developed from the work of Smith (1983), and it is from Curtis that the process undertaken here is adopted.

The first step in this process was to select the variable pairs to be tested for co-variance. This selection was based on logic and prior knowledge of likely co-varying variables, such that decorative technique is possibly co-variant with the tool being used. Secondly, only combinations within the broad groupings of stylistic, technological, shape, and size were considered. This helped reduce the number of pairs to be tested to a manageable size.

The method for testing the co-variance of each selected nominal pair of variables is Goodman and Kruskall's *Tau* (G&K *Tau*), and for interval pairs Spearman's rho is employed. G&K *Tau* is an asymmetrical proportional reduction of errors measure of association that is suitable for nominal data (Shennan 1997:119-121). Basically, it gives the reduction of the number of errors we would make in guessing the state of one attribute if we knew another. Values of G&K *Tau* range from 0.0 to 1.0. A value of 0.0 represents a 0 percent reduction in predicting the unknown attribute and thus no association, and 1.0 represents a 100 percent reduction in such errors and a perfect association. Because G&K *Tau* is asymmetric, two values are reported, one for each variable in the pair being tested for co-variance. G&K *Tau* is calculated by SPSS 17, which reports both values. Stronger associations, those with G&K *Tau* values above 0.15 (or a 15 percent reduction in errors for either variable as the dependent) are considered of interpretive value and are used to form variable combinations for analysis, shown in Table 11. All values are reported in Appendix B: Variable Combinations.

Variable Combination
FDB tool + technique + configuration
SDB tool + technique + configuration
Interior tool + technique + configuration
Lip tool + technique + configuration
Overall tool
FDB technique + SDB technique
Exterior rim profile + Interior rim profile

Table 11. Variable combinations used for analysis

Note: FDB = First exterior decorative band, SDB = Second exterior decorative band

G&K *Tau* is only applicable for comparing nominal to nominal data. For comparison of interval variables, e.g., body thickness and rim thickness, Spearman's rho was used. Spearman's rho returns results within a range of -1 to +1, either extreme representing a perfect correlation, and can include a level of significance. Spearman's rho values are reported in Appendix B: Variable Combinations.

Variable combinations were not formed from the Spearman's rho results; rather they were used to identify trends in the interval data in the following discussions. All coefficients were generated using SPSS 17, which also provided probabilities for the correlations.

Analysis of Diversity

One of the often noted characteristics of the Kitchikewana assemblage is its diversity. Diversity in style, shape, and technological attributes has been noted by site investigators (Ross et al. 1990:2-3; Ross and D'Annibale 1994:4). However, the variability of the entire assemblage has not been quantified. Therefore the second step towards elucidating Kitchikewana's pottery assemblage diversity is to quantify it using Simpson's Diversity Index.

Simpson's Diversity Index (Simpson 1949), developed for the biological sciences, is essentially the likelihood or probability that a second individual selected at random from a population should be of the same species as the first (Margurran 2004:114-115). The results for Simpson's Diversity Index (D) calculations represent maximum diversity at 0 and no diversity at 1. To make the numbers more intuitive, Simpson Diversity Index is typically expressed as:

$$1 - D$$

thus making a value of 1 infinitely diverse and 0 homogenous. This is the convention adopted here.

Simpson's Diversity Index was selected for this analysis largely for its simplicity, but also because it is adaptable (i.e., species , or *n*, can be any nominal unit, object, or component), and it is "one of the most meaningful and robust diversity measures available" (Margurran 2004:115). As Margurran (2004:115) states, however, Simpson's is biased by the most abundant species in the sample, and when the number of species (*N*) exceeds 10, the distribution of species must be examined to verify if the index has a high or low value.

To determine the diversity of the Kitchikewana assemblage, species in the Simpson's Diversity Index is replaced with the variable combinations of first exterior decorative band tool + technique + configuration, second exterior decorative band tool + technique + configuration, interior tool + technique + configuration, and lip tool + technique + configuration. One Simpson's Diversity Index value was calculated for the diversity of each decorative variable combination, and a mean variability derived from those values, representative of the overall variability of stylistic traits. The results of this are presented in the following chapter (Table 14).

The Simpson's Diversity Index values of the Kitchikewana's assemblage, while interesting, really mean little in isolation. Therefore, Simpson's Diversity Indices for other well documented Middle Woodland pottery assemblages (from the East Sugar Island, Serpent Mounds, Log Cabin Point, Thede, Inverhuron-Lucas, and Donaldson sites) are calculated and contrasted with the Kitchikewana index, thus providing an indicator of the relative diverseness of the Kitchikewana assemblage. To accomplish this task, the necessary data was obtained from published ceramic analyses; the sources are presented in Chapter Three. Other literature sources for other sites were examined (e.g., Daechsel 1981; Emerson 1955; Wright and Anderson 1963), but none had the details necessary for this portion of the analysis.

Unfortunately, given the differing research questions and eras when these works were completed, the data is in different formats. While data obtained from the work of Curtis was tabulated in the same format as that used here, ceramic data for the Thede, Donaldson, and Inverhuron-Lucas sites from Finlayson (1977) was recorded differently. However, data could be compiled in the proper format using tables and written descriptions in the original publication.

The only significant difference in Finlayson's technique was his use of Primary and Secondary decoration. Given his amalgamation of different configurations of decoration into "design sequences", his "primary decoration" is taken as analogous to an overall exterior decorative category including tool, technique, and configuration. This is roughly equivalent to a combination of the first exterior decorative band and second exterior decorative bands in this study.

Cluster analysis is used in the next phase of the analysis to examine the diversity of the Kitchikewana assemblage for possible non-obvious underlying patterns. Clustering is undertaken to generate groups of like vessels that are interpretable as correlating with temporal periods of occupation within the broader Middle Woodland period, and/or with different cultural or social influences occurring at the site.

Cluster Analysis

Cluster analysis is a collection of non-parametric, non-probabilistic, multivariate statistical techniques which can be used to discover and group similar cases within a population. It is predicated upon two main concepts: the similarity between objects can be quantified based upon a comparison of attributes, and those similarities can be ordered to reveal groups or clusters of mathematically similar objects. Guidance for this procedure was found largely through two texts *Cluster Analysis for Researchers* (Romesburg 1990) and *Quantifying Archaeology* (Shennan 1997), and the statistical package *ClustanGraphics8* (Wishart 2006).

While clustering had its first applications in anthropology and psychology in the 1930s (Bailey 1975:59) it was not until 1963 when Sokal and Sneath published their *Principles of Numerical Taxonomy* (developed for statistically classifying organisms), that the concept took hold. Popularized in the biological sciences, cluster analysis became increasingly popular in archaeological circles with both the proliferation of affordable and powerful computers (needed to perform the sometimes lengthy calculations) and the rise of processualism (clustering is an *objective mathematical* method for grouping objects) (Aldenderfer and Blashfield 1984:8; Shennan 1997:217).

The groupings that cluster analysis creates can be viewed as statistically probable in a taxonomic sense. The groupings, or clusters, are formed from the statistical similarity or dissimilarity between the objects. While many variations of cluster analysis exist, the basic procedure for each is the same. Grossly simplified, it comes down to two main steps: the derivation of a coefficient of similarity between each of the objects (based on their attributes) and the clustering or grouping of the objects based on that coefficient. The groups that are created can be interpreted in many ways and the different methods of clustering can create greatly different or very similar groups.

Realistically, there are more steps. The first task in this analysis was the selection of the variables that signify each object (as discussed above). In cluster analysis the variables can be represented on any data scale and can be non-parametric. Variables in this pottery analysis include decorative tool and application technique (nominal) and vessel metrics such as rim thickness in centimeters (interval). Variable selection can be a tricky process as it is subjective and not all variables of an object are relevant to the goals of the study. In this analysis, variables believed to be of cultural salience, based upon previous studies, are favoured as only they have the potential to identify culturally important groupings within the assemblage (Read 2007:139). Furthermore, variables should not be strongly correlated, otherwise they could lead to "double-counting", thereby exerting undue influence in the similarity calculations (Baxter 1994:168). A clustering exercise is only as good as the data that is fed into it and it is therefore important to define the goals of the analysis early and keep them clearly in mind throughout.

Once the attributes for each vessel were recorded into a *Microsoft Access* database, where the variables are represented in the columns and the vessels in the rows, the information was exported into a Microsoft Excel spreadsheet, a format compatible with the clustering software *ClustanGraphics8*. From the data the degree of similarity between each object was calculated in *ClustanGraphics8*. This is referred to as the similarity coefficient. The similarity coefficient is calculated from the number of similar attributes one object shares with another, and is expressed as a single value. There are many formulas for calculating the coefficient and the data type plays a large role in the selection. In archaeological situations the attributes are often of mixed data types (i.e., nominal, ordinal, interval, and ratio or metric and non-metric). There are multiple ways to deal with data on mixed scales, the most basic of which is to convert the data into the same scale, typically making it all nominal data. One issue with converting interval to nominal, as done in Green's pottery analysis of Mississippi vessels (1974), is that while the transformation of the data keeps the analysis simple, it eliminates the quantitative relationship between the classes.

More complex mathematically, yet more accurate, is the use of a similarity coefficient created to address multi-scale data, such as Gower's general coefficient of similarity (Gower 1971), the method chosen for this analysis. Gower's coefficient changes to suit the type of data being evaluated and yields comparable similarity values. It deals with each scale in its original form.

In his first edition of *Quantifying Archaeology*, Shennan's original, and primary, assessment of Gower's is that it has "found fairly extensive archaeological use", though he provides little further information on this coefficient (Shennan 1988:207). Baxter (1994:153) suggests the opposite, due to a lack of published examples. Shennan revises his assessment in his second edition, suggesting that Gower's showed initial promise, but "has never come into general archaeological use", but again fails to provide details, comments or criticisms of its archaeological application (Shennan 1997:233). To briefly examine the archaeological use of Gower's, a keyword search of the online JSTOR journal article database, at http://www.jstor.org, was undertaken September 12, 2011.

While this is by no means an exhaustive test of Gower's popularity, it provides a quick quantitative assessment of its published appearances. The entire JSTOR database of over 1482 journals was searched for articles containing the terms "archaeology" and "Gower's"(JSTOR 2011a, 2011b). This search returned 88 citations. Each citation was appraised either through the abstract or by examining the actual article, revealing that only one was an archaeological application of Gower's method, pottery material source cluster analysis in Florida (Cordell 1983). Given this paucity of published archaeological examples, it appears that Gower's has not found broad archaeological use, comment, or critique.

Baxter does further suggest that Gower's is "not much use in practice…"(Baxter 1994:153), though we are left to guess why this is so. The only cautions provided are a sensitivity to outliers (common to many other similarity measures), and the possibility of Gower's overweighting nominal variables (Baxter 1994:153).

Outliers in this analysis were, for the most part, removed when the collection was restricted to Middle Woodland vessels. The possibility of overweighting of nominal variables is likewise not of concern given the only other methods to complete this clustering exercise do not allow mixed data and would require the conversion to categorical values.

Gower's coefficient also allows for the weighting of specific variables. While the weight is typically set at 1 for all variables (all are then given equal weight in the analysis), as Shennan (1997) states, "there is no reason in principle why it should not be varied to reflect any ideas the analyst may have about the relative importance of the different states." In this analysis weights were assigned to variables to derive different clustering outcomes based on overall similarity, technological similarity, stylistic similarity, and pottery tradition similarity. Weighting was undertaken at a basic level whereby a variable that is to be more heavily weighted was assigned a weight of 2, a normally weighted variable was assigned a weight of 1, and if a variable was not being used, the weight assigned was 0. Thus, seven similarity matrices were generated:

1. all variables are equally weighted,
2. technological variables are more heavily weighted,
3. only technological variables are considered,
4. stylistic variables are more heavily weighted,
5. only stylistic variables are considered,
6. archaeologically acknowledged characteristics for the Saugeen and Point Peninsula traditions are more heavily weighted (all variables used), and
7. a final matrix based upon *only* those acknowledged differentiating variables for Saugeen and Point Peninsula (limited variables).

All variable weights are reported in Table 12. Subsequent clustering procedures were run with weighted variables then exclusive variables (e.g., steps 2 then 3 noted above), for two reasons. First, the weighted clustering is inclusive of all attributes, and will thus be sensitive to all recorded aspects of the vessels. Secondly, the exclusive clustering, e.g., that with only stylistic variables, is carried out to determine if these isolated aspects account for patterning, and is further based upon Read's (2007:306-309) demonstrations that including more variables in a cluster analysis *decreases* the probability of finding inherent clusters within the data.

Distinguishing variables for the Saugeen and Point Peninsula traditions are based upon the criteria outlined by Finlayson (1977) and his analysis of the Donaldson and Thede sites, and Wright and Anderson's (1963) analysis of the earlier excavations at the Donaldson site as summarized by Spence et al. (1990:158). Spence et al. (1990:158) identify "more frequent occurrence of interior channelling, thinner vessel walls, finer

Variable	Clustering Solution 1	2	3	4	5	6	7
Castellations	1	1	0	1	0	1	0
Consistency	1	2	1	1	0	1	0
Delimeters	1	1	0	2	1	1	0
SM Body Exterior	1	2	1	1	0	1	0
SM Body Interior	1	2	1	1	0	2	1
SM Rim Exterior	1	2	1	1	0	1	0
SM Rim Interior	1	2	1	1	0	2	1
Lip Form	1	1	0	1	0	2	1
Wall Orientation	1	1	0	1	0	1	0
Rim Orientation	1	1	0	1	0	1	0
Exterior Rim Profile	1	1	0	1	0	1	0
Interior Rim Profile	1	1	0	1	0	1	0
FDB Configuration	1	1	0	2	1	1	0
FDB Technique	1	1	0	2	1	1	0
FDB Tool	1	1	0	2	1	1	0
SDB Configuration	1	1	0	2	1	1	0
SDB Technique	1	1	0	2	1	1	0
SDB Tool	1	1	0	2	1	1	0
Interior Configuration	1	1	0	2	1	1	0
Interior Technique	1	1	0	2	1	1	0
Interior Tool	1	1	0	2	1	1	0
Lip Configuration	1	1	0	2	1	1	0
Lip Technique	1	1	0	2	1	1	0
Lip Tool	1	1	0	2	1	1	0
Temper Type	1	2	1	1	0	1	0
Temper Quantity	1	2	1	1	0	1	0
Temper Size	1	2	1	1	0	2	1
Body Thickness	1	1	0	1	0	2	1
Lip Thickness	1	1	0	1	0	1	0
Rim Thickness	1	1	0	1	0	2	1
Rim Diameter	1	1	0	1	0	1	0

Table 12: Variable Weights

Note: Column 1 = equally weighted, 2 = technological variables heavily weighted, 3 = only technological variables, 4 = stylistic variables heavily weighted, 5 = only stylistic variables, 6 = variables defining Saugeen and Point Peninsula are more heavily weighted, 7 = only variables defining Saugeen and Point.
SM = Surface Modification FDB = First exterior decorative band, SDB = Second exterior decorative band

paste, higher proportion of pointed lips, use of red ochre washes, and finer dentate" as traits distinguishing Point Peninsula Tradition pottery from Saugeen Tradition Pottery.

Thus, the variables of: interior surface modification (both body and rim), body and rim thickness, temper size, and lip form are weighted more heavily in the all variables clustering and are the only variables used in the limited variables clustering. Further details on the derivation of these trends for identifying pottery traditions are provided in Appendix C: Defining Middle Woodland Pottery Traditions.

Of particular note in the clustering method is that the combined variables are not used in clustering, rather the individual variables are retained. It is the individual variables that are often described as being either culturally or temporally sensitive, e.g., pseudo-scallop shell tool use decreasing in frequency thought time. Therefore it was determined that the individual variables may provide more detail information in the final solutions by adding their own specific significance to the calculations.

Once the similarity coefficients were calculated the next step was to choose the method of clustering to be used. Again this presented an important decision as there are many methods and each can produce different results. The most common method, and best at creating useful clusters, is the unweighted pair-group method using arithmetic averages (UPGMA) (Romesburg 1990:139; Shennan 1997:240). First, all objects are considered single member clusters. Second, the two objects with the closest similarity coefficient are clustered. This cluster is treated as a single unit and the similarity matrix is updated, removing individual objects and adding a new one for a new cluster. The average values for the individual objects and those of the other cluster are calculated and these are used as the new coefficients to form the next match. The process is repeated until a final cluster is created which incorporates all of the objects. The divisions and clusters are represented in a dendritic diagram where like vessels are connected at higher and higher levels of dissimilarity leading to the final single cluster. This entire process was completed using *ClustanGraphics8*. The typical form for presenting clustered data is a dendrogram. This tree-like graph illustrates the level of similarity at which each cluster is joined.

The appropriate number of clusters from a dendrogram can be determined through different means, two of which are of interest here: researcher observation or the method selected in this analysis, bootstrap validation. Researcher determined cutting of the clusters is typically done based on personal intuition and interpretations. This has been the mainstream method in archaeological clustering (Aldenderfer 1982:61). The most reliable arbitrary method is examining the dendrogram for a point along the similarity axis where the lines connecting objects and clusters become significantly longer, indicating a jump towards decreased similarity. As seen in the various clustering exercises undertaken here, there are few longer lines, inhibiting an informed researcher based cutting into clusters due to significant similarities.

Bootstrap validation is a statistical approach to both finding the appropriate number of clusters and to validating that result. Bootstrap validation, a method available in *ClustanGraphics8*, is predicated upon the expectation that there is a pattern to the data, and therefore divisions in the dendrogram that are the furthest from random are searched out (Wishart 2006). Statistically, the null hypothesis is that the organization of the dendrogram is random, thus one seeks to reject the hypothesis. To create an appropriate randomness for comparison, bootstrap validation creates a specified number of trial clustering sequences from a randomization of the similarities from the original similarity matrix. The default setting of 120 random trials, with randomizations based upon the data, was used. The series of randomized dendrograms creates a mean tree and confidence interval. Comparison of the original dendrogram to the random ones enables the testing of the null hypothesis. Significance is based upon a 2.57 t-statistic. *ClustanGraphics8* automates this procedure, provides visualization of the results, and identifies where the connecting of objects or clusters in the original dendrogram depart significantly from random, thus identifying a statistical division point in the data.

Possible concerns with the use of cluster analysis stem from the inductive nature of the derivation of the attributes, the subjective selection of both the resemblance coefficient and the clustering method, and that the final product relies on informed judgment to be useful. Also, while any number of cases more than one can be clustered, a sufficient sample size and attribute diversity is required to make the analysis worthwhile. It is simply a case that with smaller samples and/or fewer attributes, the clusters should be obvious to the researcher. Furthermore, as with most statistical methods, a larger sample size will produce better results. It should also be noted that cluster analysis is ultimately a *descriptive method* and the sample is chosen non-randomly. Extrapolation to the population at large is therefore through analogy and is not probabilistic. This ties back into the issue of subjectivity in that the extrapolation of the analysis relies on informed judgment (Romesburg 1990:31). Thus, it is ultimately up to the researcher to determine the validity of the results; a failure to find clusters in the data does not indicate they are absent, as it may be the clustering method is not sensitive to the pattern present (Read 2007:138).

These concerns do not negate the value of clustering, notably when recognizably homogenous groupings are created. In this analysis, the criteria for the clustering solutions to be deemed valid (i.e., possibly representative of material culture patterning), and informative are firstly that the solution's clusters will have within group attribute cohesion *in addition to* external divergence (established through attribute distributions). Secondly, because the different variable weightings find the same cluster – or collection of clusters – the solution providing the greater number of clusters, and thus the least within group variation, is considered more informative. It must also be noted that this reproduction of similar clusters increases the likelihood that the derived groupings are based in reality (Baxter 1994:165). Although repetitive clusters are of note, clustering solutions that are not unique, or are not considered informative are rejected from indepth analysis. Justification for inclusion or rejection of each solution is provided in Chapter 6: Cluster Analysis and Discussion.

Statistical associations between cluster membership, for those solutions retained as informative, and variables were calculated to test the strength of observed patterns in attribute distributions, i.e., are clusters statistically set apart by variables? That is to say, if the decorative tool is known, could the cluster membership be predicted, or vice-versa. Again, G&K *Tau* was used for nominal data. Values indicating reduction of errors equal to or greater than 25 percent (value of .25) are considered significant in this analysis. For nominal – interval associations the measure *Eta* was chosen. *Eta* is another asymmetric measure of association which can be used for nominal to interval comparisons. The values reported via *eta* have a range of -1.0 to +1.0 and either extreme is an indicator of a strong association. While the values of *eta* are not directly comparable to those from G&K *Tau* or Spearman`s rho, eta^2 is essentially the percent of variation in the dependent variable that can be predicted by knowing the independent variable. Therefore eta^2 values equal to or exceeding 25 percent (value of .25) are considered significant in this analysis. All values are calculated in SPSS 17 and are reported in Appendix E: Associations Between Cluster Membership and Attributes and are examined with each discussion of the viable clustering solutions in Chapter 6: Cluster Analysis and Discussion. Combined variables for stylistic attributes were not used in the assessment of variable correlation to cluster membership because there is too much variation within the categories, e.g., combined first exterior decorative band has 26 unique combinations (see Appendix B) with a limited number of vessels sharing the exact came combination, therefore making prediction of the cluster membership grossly simplified. For example, if there is only a single vessel of type *x*, and it is in Cluster *Y*, then the reduction of errors by knowing the type is 100 percent. Additionally in this scenario, if Cluster *Y* has 5 vessels, each with a slightly different first exterior decorative band combination, for example all are dentate stamped, but the configuration is unique, then knowing the cluster only provides a 1/5, or 20 percent reduction in predicting the exact combined variable. Conversely, if the individual variables are used, and we know the membership in Cluster *Y*, there is a 100 percent reduction of errors in predicting both tool type *and* technique, because all are dentate tool stamped, and only the configuration will have a decreased error reduction rate, in this scenario 20 percent.

Summary

This chapter outlines the methods followed in this analysis. First, the use of attribute analysis is justified, followed by a detailed description of the variables and combined variables examined for this study. Though a thorough statistical description of the assemblage based on those variables, a comparative analysis of the assemblage's diversity, followed by cluster analysis, and then statistical description of the resulting clusters the nature of the Kitchikewana assemblage is illustrated not just internally, but in relation to other collections. To further place the Kitchikewana assemblage into a regional picture, comparison of the assemblage, and the significant clusters generated from it, to documented assemblages from elsewhere in the province are undertaken to discover possible ties to the larger pottery traditions. Through this statistical process, the characteristics of the Kitchikewana pottery assemblage are revealed, and it is possible to begin to place the Kitchikewana assemblage into the regional social and material culture milieu.

CHAPTER 5: FREQUENCY AND DIVERSITY ANALYSIS AND DISCUSSION

This chapter summarizes the frequency analysis of the Kitchikewana assemblage as undertaken following the procedures detailed in the preceding chapter. As reported below, the Kitchikewana Middle Woodland pottery presents an interesting mix of traits diagnostic to different cultural traditions and phases within the period. The sample population consists of 57 vessels. One vessel (number 24) was unavailable during the analysis and a high quality reproduction was used to obtain as many observations as possible, however not all variables were discernable. It is noted below whenever the variable for vessel 24 is not observable from the cast. In the following section, detailed discussion of the frequencies of attributes is generally limited to provide a more succinct depiction of the results. Detailed tallies and frequencies are reported in Appendix A: Attribute Frequencies.

Included in this analysis are salient comparisons aimed at finding relationships between the Kitchikewana assemblage and those from other Middle Woodland assemblages. While there are numerous attributes that can be compared and contrasted between the assemblages, emphasis is placed on those that can provide insight into either temporal correlations or the identification of Point Peninsula versus Saugeen pottery traditions. To reiterate on the latter, Point Peninsula should have "more frequent occurrence of interior channelling, thinner vessel walls, finer paste, higher proportion of pointed lips, use of red ochre washes, and finer dentate" (Spence et al. 1990:158) and an increased incidence of overall vessel decoration. A "more frequent occurrence" of these attributes is a relative statement, and as such the first task was to establish basic metric parameters. In Appendix C the characteristics listed above are examined using well-documented Saugeen and Point Peninsula collections, which could provide comparative data. This authenticated some of the characteristics, but contradicted others. These are used as an objective baseline for each of the related attributes, which are then contrasted to the Kitchikewana assemblage attribute frequencies throughout the following discussion. The comparative characteristics are derived or compiled from the sources noted in Table 2.

As with most attempts to fit artifacts into existing typological constructs, even those at the broad level of tradition, the overall picture that forms is one of non-conformity; the Kitchikewana Middle Woodland pottery assemblage does not correspond clearly with either Saugeen or Point Peninsula pottery.

Stylistic Variables

Kitchikewana Middle Woodland vessels are typically decorated with at least two exterior decorative bands (81 percent) with 14 percent having only one decorative band and 5 percent with no decorative bands at all.

Between the exterior decorative bands delimiters appear on 33 percent of the vessels. When exterior delimiters do appear, punctates and blank spaces are equally common at 48 percent each. Exterior bosses occur on a single vessel and interior delimiters are not present.

Accordingly, delimiters appear to play a minor, yet present, role in vessel style. Other researchers have noted that delimitation and punctates are temporal indicators more common to, or are diagnostic of, assemblages from the latter Point Peninsula Middle Woodland or early Late Woodland periods, and are commonly used in association with cord wrapped stick decoration (Curtis 2002:20-21; 2004b:223; Daechsel and Wright 1988:8, 13; Fox 1990:175; Gates St-Pierre 2001a:62; Stothers

1975:22). Therefore the frequency of punctate use here, which is in the general range (14.6 to 63.3 percent) reported by Curtis for Sandbanks sites (2004b:282-283), might indicate a later component related to the Point Peninsula tradition. However, other attributes paint a different picture.

Examination of the overall sherd assemblage, not just the identified vessels, suggests that the Kitchikewana pots were not typically decorated all over their exteriors, rather only in their upper portions. This is evidenced in the sherd tallies (Table 3) where of the 15,535 body sherds, 62 percent are plain compared to just 3 percent of the 2,700 rims are plain.

One indicator proffered for differentiating Saugeen and Point Peninsula assemblages is that Saugeen pottery tends to exhibit more overall exterior treatment, i.e., the entire vessel exterior is decorated. For Saugeen sites, the range for exterior body sherds to be plain is from .4 percent to 11.4 percent, conversely Point Peninsula sites range from 30.5 percent to 49 percent plain (see Appendix C). As a result the predominately plain bodied Kitchikewana assemblage is, in this factor, more akin to a Point Peninsula assemblage. Also, given the temporal trend for a decrease in overall exterior decoration (Wright 1999b:633) though time, this may well indicate a later occupation, but this is in contrast to the decorative tool frequencies, discussed below.

For vessel based exterior decoration, in the first exterior decorative band the only variable combination showing any considerable concentration is dentate stamped oblique right, accounting for 21 percent of the vessels, see Appendix B.

As singular variables, configuration types are commonly oblique right, followed by horizontal, then vertical. First exterior band decorative technique is dominated by simple stamping with single occurrences of rocker-stamping, incising, and drag-stamping. Dentate is the most common tool used for 53 percent of the decoration, then pseudo-scallop shell at 16 percent, closely followed by cord wrapped stick at 14 percent.

Decoration of the second exterior decorative band tends to also be with a dentate tool (at 52 percent), followed by pseudo-scallop shell and cord wrapped stick tools (each at 17 percent), but as the variable combinations show (Appendix B), there is much variation when the three part tool + technique + configuration variable is examined. In fact, unlike the first exterior decorative band there is not even a slight concentration for any combination.

Decorative technique for the second exterior band is mainly stamped with some occurrence of rocker stamp, drag stamp, push-pull, and incising. Configurations are fairly evenly distribution between vertical, horizontal, and oblique right. Interestingly, horizontal difference configurations appear more popular in the second exterior decorative band (five instances) than in the first exterior decorative band (one instance). While chi square testing demonstrates this is not significantly different from a hypothetically uniform distribution of this configuration between the bands at the .05 confidence level ($\chi^2(1, n = 6) = 3.3; p > .05$), it does exceed the critical value at the .1 confidence level, and can thus be seen as being of some weak statistical significance. However it must be stressed that not all of the assumptions for a proper test are met as both of the calculated expected values are less than five.

Two combined variables, one of technique and one of configuration between the first exterior decorative band and second exterior decorative band were identified in the G&K *Tau* calculations as having a stronger association. From these combinations we see that when the first exterior decorative band and second exterior decorative band techniques are combined, stamping is the most common, however for both technique and configuration there is significant variability.

Vessel interiors are typically plain (54 percent), but when decorated they tend to be dentate stamped, drag-stamped, or rocker stamped in vertical orientations, with some oblique right orientation. Interior decoration is 33 percent dentate, but pseudo-scallop shell (5 percent) is also present. Although cord wrapped stick occurs more often on exteriors (nine instances in both first exterior decorative band and second exterior decorative band combined) than on interiors with a single occurrence, this is not a statistically different distribution than that of a hypothetical uniform distribution given the decreased incidence of any interior decoration ($\chi^2(1, n = 10) = 2.8; p > .05$).

Combined lip decorative variables show the popularity of oblique right stamping, most notably for dentate and cord wrapped stick tools. Tool type is again similar to that noted for the exterior of the vessels with dentate accounting for 40 percent, while cord wrapped stick and pseudo-scallop shell are also present in significant quantities, 16 and 12 percent respectively. Sixteen percent of vessels have plain lips.

Orientation is variable with oblique right being the most common, followed by vertical, oblique left, and horizontals. Of note here is the appearance of punctates, although as a minor orientation. By far the most common decorative technique is stamped, with push pull, drag stamp, and incised all appearing once.

G&K *Tau* calculations identified a strong association in tool type between all vessels areas. This is the result of the same tool being used in most areas of the same vessel, that is to say that if dentate tool is used in one area, it is likely to be the tool used in other decorative areas, demonstrating a consistency in tool use upon a vessel.

These stylistic trends, notably the predominance of dentate tool use with the presence of both cord wrapped stick and pseudo-scallop shell in notable quantities are in accordance with the those characteristics diagnostic of, or common to, the Rice Lake Phase of the Point Peninsula Tradition (Curtis 2004a:221), rather than a later phase or tradition dominated by cord wrapped stick decoration and textured surfaces or an earlier one with pseudo-scallop shell tool being the norm. However, the prevalence in this collection of the simple stamped technique is not a trait of the Rice Lake Phase, but is in fact more common with later Saugeen Tradition pottery, in particular the frequencies found at the Thede site, where simple dentate stamping accounts for 74 percent of the assemblage (Finlayson 1977:88, 230). That being the case, later assemblages may include an increasing frequency of cord wrapped stick decoration, but cord wrapped stick decoration is negligible at both the Donaldson and Thede sites (Finlayson 1977:87, 292).

Shape Variables

Kitchikewana vessel lip form tends to take one of two shapes, straight or convex, accounting for 45.6 percent, and 40.4 percent of the collection. Complex lip forms are uncommon at 12.3 percent and concave lips are rare with a single occurance. Fattened lips, created by shaping the uppermost coil, occur in five cases. Exterior and interior rim walls tend towards convergence, i.e., the walls get thinner towards the lip, while the rim is almost consistently outflaring.

Rim profiles (i.e., cross sections) are commonly concave on the outside and convex inside as shown in Table 13. Statistically, rim interior profiles are not distributed significantly different from a hypothetically even distribution ($\chi^2(2, n = 57) = 1.3; p > .05$); however exteriors are significantly non-uniformly distributed ($\chi^2(2, n = 57) = 12.3; p > .05$).

	Exterior Rim Profile (%)			
Interior Rim Profile	Concave	Convex	Straight	Total
Concave	0 (0)	9 (16)	1 (2)	10
Convex	15 (26)	11 (19)	5 (9)	31
Straight	2 (4)	3 (5)	11 (19)	16
Total	17	23	17	57

Table 13. Interior and Exterior Rim Profile Crosstabulation

Two examples of incipient castellations are present in the sample and are thus a rare trait. As previously noted, all other castellated vessels were removed from the attribute analysis as prominent castellations are a well-documented Late Woodland trait (Curtis 2004a; MacNeish 1952; Trigger 1986:94), although Curtis (2004a:56) does note their likely genesis during the Middle Woodland period.

Comparatively, rims that are convex inside and concave outside, and lips that are convex or straight are traits common to both the Trent or Rice Lake phases of the Point Peninsula tradition and to the Saugeen tradition (Curtis 2004b:289-290; Finlayson 1977:87, 292). An increased incidence of pointed lips, here referred to as complex, is also supposedly an indicator of Point Peninsula affiliation (Spence et al. 1990). However, as demonstrated in Appendix C, this does not appear to be a viable trend, in fact it is a rare trait entirely, and observed more on Saugeen pottery. Indeed, the

Kitchikewana distribution of lip form is very similar to that from the Donaldson site, and somewhat similar to the Serpent Mounds assemblage in the inclusion of a concave form.

Technological Variables

Coil breaks are present on 16 vessels (28.6 percent), yet might be underrepresented in the sample if, as previously stated, coil breaks only occur with less well made pottery thus equating to a breakdown of the vessel and an increase in the likelihood it will not be identified as a vessel for inclusion in this study. This appears to be valid given that 94 percent of vessels with a well-knit consistency do not exhibit coil breaks. Furthermore, no evidence of moulded construction (delaminating surfaces, fabric impressions, etc.) was seen.

Archaeological excavation field notes from Kitchikewana commonly refer to the recovery of crumbly or friable sherds, so it was initially surprising that better consistency vessels are well represented. Well knit, laminated, and intermediate consistency pottery account for 70 percent of the sample, while chunky and crumbly pottery (the most commonly noted types in the field notes) account for the remainder. However, the sampling method used in this study biases against the inclusion of more friable examples as they are less likely to retain the structure necessary to identify the required attributes and were thus excluded from the analysis. The field note comments are shown to be valid when examining the overall assemblage, not just the identified vessels, where sherdlets (which are often small and crumbly) account for 48 percent of the pottery assemblage (n=17,672).

Exterior surfaces of the Kitchikewana vessels are commonly smoothed, but wiping is also present. Combing (a.k.a. channelling) of exteriors is rare, appearing on just two vessel bodies and one rim. Rim interiors are much more likely to be smoothed than wiped or combed, which are equally common. Body interiors are often combed, with a frequency of 43 percent, while wiping and smoothing occur in similar smaller frequencies. One of the principal differentiating traits of Point Peninsula pottery from Saugeen is said to be a "more frequent occurrence of interior channelling…"(Spence et al. 1990:158).

For Saugeen sites, interior combing occurs at frequencies ranging from 6.8 percent 31.8 percent, with an average of 17.7 percent. From Point Peninsula tradition sites, the range of interior channelling is from 8 to 35 percent (Curtis 2004b:304-305; Daechsel 1981:74,152). Comparatively, the Kitchikewana assemblage is 43 percent combed on the interior of the body, demonstrating a significantly higher incidence of combing than any of the other sites.

As a final remark on interior surface treatments, while compiling the data for this comparison, it came to light that there could be an argument made against the inclusion of channelling in the differentiating attributes. While there are methodological discrepancies between the analyses consulted (e.g., sherd versus vessel based tallies, varying terminology), it appears that the Saugeen tradition could actually have a higher incidence of interior channelling than Point Peninsula tradition pottery if the Sandbanks assemblages are included with the latter grouping. Regardless, it does not appear, as Wright states of Ontario Point Peninsula that there is a "much higher incidence of interior channelling on Point Peninsula vessels" (Wright 1999b:633). A more in-depth analysis of this phenomenon is not within the scope of this study, but from the data presented here, there is no clear trend in combing with Saugeen sites being distributed across the range (details are provided in Appendix C).

Interestingly, of the 12 vessels with combed rim interiors 10 have no interior decoration, suggesting that smoothing of surfaces may be done for the application of decorative elements, but not exclusively so, or conversely that smoothed surfaces were those chosen to receive decoration. Perhaps this is a practicality, as decoration would not readily appear on combed surfaces.

The Kitchikewana vessels include a wide range of tempering practices. The one known raw clay source near the site is relatively clear of inclusions and thus tempers must have been added if the local clay was used. While there are 16 temper combinations or single sources in the sample, most vessels are tempered to between 5 to 25 percent of the fabric with just grit type 1 or grit type 1 with another agent. Single source tempering is the most common method and grit type 1 is the temper of choice appearing singly in 45 percent of vessels and in variable combinations in an additional 29 percent vessels. Grit temper types 3, 4, 5, and 6 are also important tempers, often in dual combinations. Organic, pottery, and grit type 2 tempers are rare, appearing in a single vessel each. Thus there seems to be a sorting of tempering materials occurring, with a clear preference for grit type 1. This is surprising given that the expectations would be for a mixture of granitic borne particles, i.e., a combination of quartz, feldspar, mica, etc. For some reason, perhaps perceived thermoplastic qualities (Rice 1987:93-97), or appearance in the case of predominately mica tempered pots, specific materials were selected for tempering. Further analysis of the chemical characteristics of the tempering particles would be required to identify the exact minerals, sources, and to investigate this sorting further.

Given the significant number of divisions in temper type and the small size of the sample used in this analysis, an analysis of the distribution was undertaken to determine if the sample was representative of the tempering practices of the entire assemblage. A random sample of 350 artifact entries from the 3876 in the Parks Canada Archaeological Resources Database (providing a confidence level of 95% +/- 5) was generated. This was accomplished using Microsoft Excel to assign a random number to each artifact record then selecting the lowest 350 random numbers. The tempering type for each entry was examined and recorded. Frequencies for both the vessels and the random sample are shown in Figure 11. Notably there are three temper types or combinations not present in the vessel sample (sand, pottery, and Grit 1, 3, and 5), but the overall frequencies appear similarly distributed. The frequency of each temper type was used as an ordinal rank in a Mann-Whitney U test in SPSS 17, which resulted with a score of 178 with an asymptotic significance of .951. Therefore, it is statistically likely that the two samples have the same distributions of tempering materials and thus the vessel sample, in this respect, is statistically similar to that of the overall assemblage.

Average temper particle size seems relatively small at 2.7 mm, with a per vessel average range[1] of .9 to 5.6 mm. Temper size is another defining trait whereby Saugeen

[1] Temper averages are based upon ten measured particles per vessel, however the individual particle sizes were not retained, only the average particle size for each vessel. In hindsight this is not a recommended procedure as the standard deviation cannot be calculated.

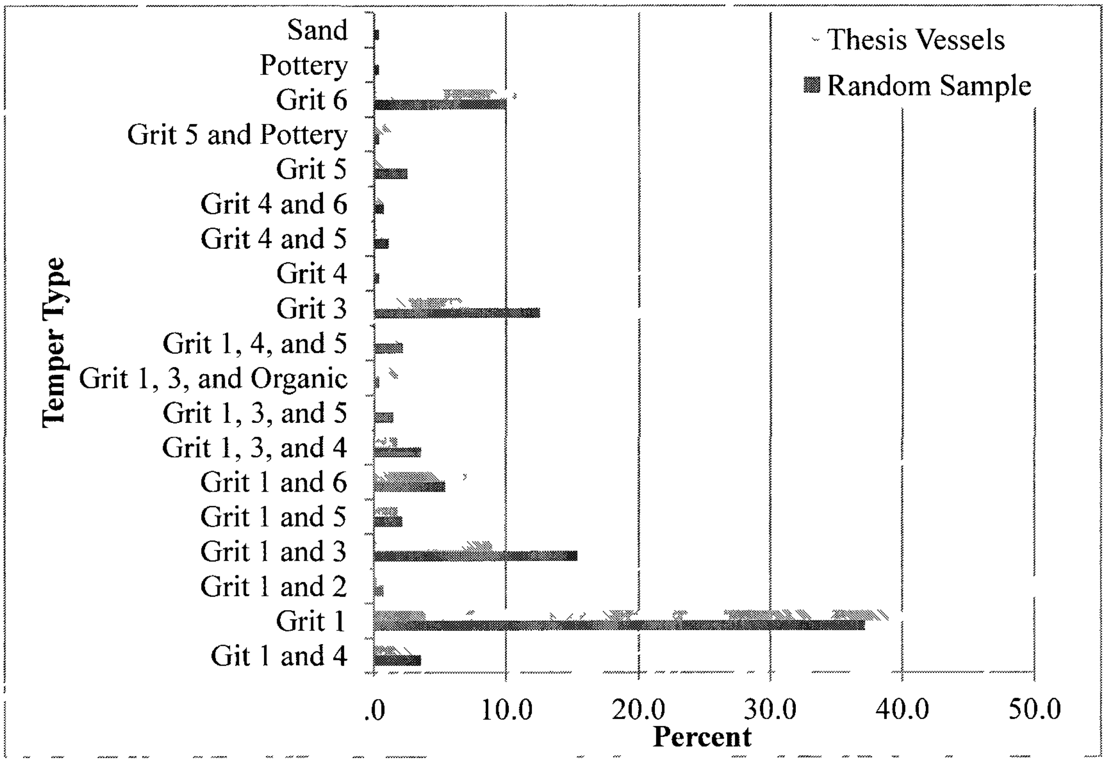


Figure 11. Frequency Distribution of Temper Material Types for the Vessel Sample (n=57) and a Random Sample (n=350).

pottery tends to have larger temper particles (Finlayson 1977:630; Wright and Anderson 1963:47). As the analysis presented in Appendix C shows, temper averages exceeding 4 mm are typically associated with the Saugeen Tradition. Thus at an average temper particle of 2.7 mm and a per vessel range of .9 to 5.6 mm, the Kitchikewana pottery is clearly more akin to Point Peninsula standards.

Size Variables

The Kitchikewana site mean body thickness is 8.5 mm with a range of 5.0 to 13.3 mm and a standard deviation (s) of 1.8. Lips at Kitchikewana range from 2.6 to 10.7 mm thick with a mean of 7.0 mm (s = 1.5). The mean rim thickness is 7.9 mm (s = 1.6) with a range of 5.0 to 11.3 mm. The average rim diameter is 204.1 mm.

Calculations of Spearman's rho, while not used specifically for forming variable combinations, clearly demonstrate positive linear relationships in wall thickness anywhere on the Kitchikewana vessels, and between wall thickness and rim diameter; as one value becomes larger, so does the other.

Temper size and vessel thickness seemed like possible co-variants, and were tested using Spearman's rho. The correlation between body thickness and temper size is significant at the p=.05 level, thus thicker bodied, and to a lesser extent thicker rimmed, vessels tend to have larger temper particles.

Wall thickness is also held as an indicator of pottery tradition affiliation with Point Peninsula pottery having thinner vessel walls, but this statement is not clarified in terms of thinner overall or only at the rim, lip, or body, or to what extent they differ. Most researchers report all average thicknesses and a comparative analysis of the data was undertaken, and the results are presented in Appendix C.

Comparison of the Kitchikewana thicknesses to this data show the Kitchikewana vessels to be in the upper range of thickness overall. Notably, the Kitchikewana thicknesses tend to fall in the same upper range as the Saugeen tradition sites, but given the overlap between Saugeen and Point Peninsula Tradition ranges, this is a tentative correlation.

One final overall comparison is with the Baxter site, from the Port Severn area (Dodd and Lennox 1996). While this site, circa 100 B.C. to A.D. 200, likely predates the main Kitchikewana occupation is the closest site to have a completed pottery analysis and provides an interesting contrast, reaffirming the temporal placement of the Kitchikewana site. All of the following data is from Dodd and Lennox (1996:70-82).

The Baxter site pottery is equally dentate and pseudo-scallop shell decorated with simple stamping in the first band. Oblique rights are the common motif. The second band exhibits more flexibility in technique with rocker stamping and drag stamping being more common. Second bands are often decorated with the same tool as used in the first. Oblique right is the most common motif in the second band, but as with technique, there is more variability than in the first band. Lips are mostly flat. Exterior punctates are absent at the Baxter site, and interior punctates are rare. Dodd and Lennox (1996:141) find the pottery from the Baxter site to be more akin to Point Peninsual pottery from the southeast, than to Saugeen. This is based primarily upon frequencies of interior combing or channelling and decorative techniques (drag stamp and rocker stamp).

The differences between the Baxter site and the Kitchikewana site are notable, and likely reflect the temporal differences in the occupations. For example, the increased incidence of delimiters and dentate stamping at Kitchikewana, both of which are thought to be later trends. Conversely, there are similarities as well, for instance the high incidence of interior combing or channelling, increased motif and technique variability in the second decorative band, same tool use in all areas of a vessel, preference for oblique right decoration, etc. Perhaps further detailed comparison of these two assemblages could help delineate temporal sequences in the region.

Diversity Analysis and Discussion

Following the procedure outlined in Chapter Three, the diversity of the Kitchikewana pottery, in terms of stylistic characteristics, was calculated using Simpson's Diversity Index. Simpson's Diversity Index is on a scale of 0 to 1, with 1 being infinite diversity. The results are presented in Table 14. Diversity is high on the exteriors and lips of vessels. While most areas examined show similar stylistic variability, interiors are the least variable.

Variable Combination	SDI Value	Rank Compared to Results in Table 15
FDB tool + technique + configuration	0.932	4th
SDB tool + technique + configuration	0.942	5th
Interior tool + technique + configuration	0.698	6th
Lip tool + technique + configuration	0.912	2nd
Average Variability	0.871 (s=0.116)[a]	Tied 6th

Table 14. Simpson's Diversity Index for Camp Kitchikewana Vessel Decoration

Note: FDB = First exterior decorative band, SDB = Second exterior decorative band

[a] s = standard deviation

To better understand these figures, similar calculations were made for the other Middle Woodland pottery assemblages, where data permitted. The results are shown in Table 15. From this diversity analysis we see that the Kitchikewana assemblage is roughly as diverse as the Serpent Mounds site, and does not, as initially believed, exhibit much more diversity than the other assemblages. In fact it seems that there is substantial diversity across all of the assemblages with Kitchikewana ranking from 6th to 2nd in comparative diversity. That being said, other slight trends were observed, and while not examined statistically, do provide some interesting insights into the assemblages and decorative style diversity through time.

Sites or Component	FDB Decoration	SDB Decoration	Interior Decoration	Lip Decoration	Exterior Decoration	Average Diversity	Standard Deviation
IHL[a]			0.400	0.900	0.700	0.667	0.252
LL	0.676	0.833	0.692	0.718		0.730	0.071
Auda	0.865	0.747	0.632	0.745		0.747	0.095
LCP H	0.844	1.000	0.345	0.822		0.753	0.283
RICH	0.856	0.802	0.690	0.767		0.779	0.070
ESI B	0.805	0.950	0.610	0.758		0.781	0.140
ESI A	0.863	0.910	0.622	0.900		0.824	0.136
LCP 2	0.894	0.934	0.689	0.862		0.845	0.108
SPB 1	0.933	0.978	0.576	0.950		0.859	0.190
SM	0.893	0.936	0.748	0.908		0.871	0.084
LCP 4	0.889	0.933	0.756	0.911		0.872	0.080
ESI S	0.947	0.952	0.692	0.908		0.875	0.123
Thede			0.887	0.831	0.957	0.891	0.063
ESI L	0.933	0.945	0.833	0.901		0.903	0.050
DON			0.951	0.926	0.979	0.952	0.027

Table 15. Simpson's Diversity Index for Middle Woodland Archaeological Sites, Sorted by Increasing Average Diversity.

Note: IHL = Inverhuron Lucas, LL = Lakeshore Lodge, LCP H = Log Cabin Point Hearths, RICH = Richardson, ESI B = East Sugar Island Black, ESI A = East Sugar Island Ash, LCP 2 = Log Cabin Point Layer 2, SPB 1 = Spillsbury Bay Layer 1-1a, SM = Serpent Mounds, LCP 4 = Log Cabin Point Layer 4, ESI S = East Sugar Island Shell, ESI L = East Sugar Island Sod and Loam, and DON = Donaldson.
FDB = First exterior decorative band, SDB = Second exterior decorative band

[a] The Inverhuron Lucas site can be considered an outlier in diversity, as it is an inadequate sample for this analysis of only 4 vessels

The most outstanding trend occurs with the Saugeen pottery tradition assemblages, Donaldson and Thede, which are both in the top three in stylistic diversity. This may in fact be a concrete depiction of Finlayson's (1977:618) and Wright and Anderson's impressions of that "decorative tools are generally applied very carelessly" (Wright and Anderson 1963:47) in the Saugeen pottery tradition.

Careless application of decoration could result in multiple combinations of tool-technique-configuration, brought on by a plethora of idiosyncratic configurations as opposed to a collection of more set patterns. Generally speaking though, it can be stated that Saugeen tradition pottery assemblages tend to exhibit greater stylistic diversity than Point Peninsula pottery assemblages.

Summary

Based on the radiocarbon dates from the Kitchikewana site we know it was occupied from at least circa cal. A.D. 262, in the middle of the Middle Woodland period, through the late Middle Woodland and into the Late Woodland. For the moment, assuming a limited temporal origin for the pottery collection, the assemblage frequencies of the relative tool types can serve as an indicator of the time period the site was occupied. This derives from the aforementioned temporal changes in tool type popularity (i.e., pseudo-scallop shell is chronologically the most popular early in the Middle Woodland, followed by dentate, which is then succeeded by cord wrapped stick at the end of the period) suggested by many researchers (Curtis 2004b; Finlayson 1977; Wright 1967). In the Kitchikewana assemblage, dentate decoration is the most popular and cord wrapped stick and pseudo-scallop shell tools are less frequent. Given the large portion of dentate tool decoration, assuming a single temporal origin, it is suggested that this assemblage was created near the middle of the Middle Woodland. However, exterior punctates are Late Woodland trait, as are flat lips according to Stothers (1975:22), and Curtis states that bosses and punctates increase in Point Peninsula assemblages into the end of the Middle Woodland, i.e., the Sandbanks phase (2002:20-21). However, this is a biased view as it ignores the likelihood that the pottery assemblage was created by multiple occupations occurring over a number of years.

Frequency analysis of the Kitchikewana Middle Woodland pottery assemblages provides the traits of the collection as a whole. This presents an interesting picture, demonstrating that the collection has some curious characteristics in regards to temporal associations, e.g., a high incidence of delimiters akin to later period sites versus mixed decorative tool use more common in the middle of the period. It is also demonstrated that the collection is not the result of a single pottery tradition being followed, e.g., the discrepancy between thickly walled vessels, like Saugeen pottery, and the use of very fine temper more common to Point Peninsula pottery. Or the prevalence of simple stamping as a decorative technique, again a Saugeen trend, combined with a very high incidence of interior combing.

The Kitchikewana pottery assemblage is therefore diverse and does not readily correspond with either Saugeen or Point Peninsula pottery. Yet, as demonstrated, it is not simply the diversity in this particular assemblage that hinders the discovery of a regional correlation, as the diversity is not unique. This chapter documents the traits of the identified Middle Woodland vessels, and illustrates that there is no clear connection to one cultural tradition, nor to one temporal phase within the period. Thus one question remains, is there a pattern within this variety that may explain the origin of the diversity?

CHAPTER 6: CLUSTER ANALYSIS AND DISCUSSION

The underlying patterning within the Kitchikewana Middle Woodland pottery assemblage is revealed in this chapter. First, basic conditions are provided to limit the potentially massive scope of this analysis. The justifications for removing some of the clustering solutions are provided. Next, the solutions retained are analysed to determine the nature of each cluster (i.e., why are certain vessels grouped together) and discussed as to their importance in identifying the causes of variability within the Kitchikewana assemblage.

Conditions

The function of cluster analysis is to find groupings of similar cases. Unnecessary variability within a cluster is therefore counterproductive, as the goal is to decrease or minimize in-cluster variation. One way to decrease in-cluster variation is to subjectively implement a greater number of clusters. This creates smaller clusters, with inherently less variability, but the method for this analysis is to objectively base the number of clusters on the bootstrap validation results. For that reason, changing the number of clusters is rejected. Clustering solutions resulting from the previously noted seven different variable weightings were subjected to the following criteria for inclusion.

First, the solution must create validated clusters exhibiting some form of homogeneity demonstrated via non-random distributions of attribute frequencies. Second, when different variable weightings produce the same or similar clustering solutions, the solution with the greatest number of clusters is retained. Justification for this is twofold: analysis of repetitive solutions is redundant, and stronger within-cluster homogeneity is inherent with additional clusters.

From these criteria of homogeneity, only the equally weighted and the limited variable Point Peninsula versus Saugeen solutions are sufficiently informative to warrant detailed analysis and discussion. Table 16 provides a brief synopsis of the justifications for the inclusion or exclusion of each solution, for more detail please refer to the discussion for each included solution below or in Appendix D.

Solution	Clusters	Included	Justification
Equal	7	Yes	Two identical and one similar cluster appear in the stylistic solution; however the other clusters in this solution are more homogenous than in the stylistic solution.
Stylistic	4	No	Two identical and one similar cluster appear in the equally weighted solution. Furthermore, Cluster 1 is heterogeneous in all variables.
Stylistic Only	6	No	Similar to the equally weighted clustering solution, e.g., Clusters 1 and 3 are very similar to equally weighted Clusters 7 and 5. Also, Cluster 6 is stylistically heterogeneous.
Technological	2	No	Cluster 1 very heterogeneous as it contains 80% of the assemblage. Cluster 2 is a combination of equally weighted Clusters 6 and 7.
Technological Only	9	No	Solution presented many small clusters, thus variables are broadly distributed.
All Variable Point Peninsula vs. Saugeen	3	No	Cluster 1 contains 84% of the assemblage, and is too heterogeneous in all variables. Furthermore, Cluster 3 is identical to equal weight Cluster 7.
Limited Variable Point Peninsula vs. Saugeen	7	Yes	Fairly homogenous clusters reflecting the variable weighting.

Table 16. State and Justification for each Clustering Solution

Equally Weighted Variables

The following dendrogram (Figure 12) illustrates the clusters generated using Gower's general coefficient to generate the similarity matrix for equally weighted variables (all weighted at a value of 1), clustered using the unweighted pair-group method using arithmetic average (UPGMA) method. A seven cluster solution is suggested via a 120 trial bootstrap validation without replacement and was adopted as shown. Cluster membership is presented in Table 17 by vessel number with *ClustanGraphics8* generated cluster exemplars shaded and noted in bold. Exemplars are those vessels that are closest to the cluster mean and thus can provide a sense of the modal, or typical, vessel for that cluster. This helps in identifying the characteristics of the cluster in a "real-world" sense such that a vessel will not exhibit the entire distribution of attributes that are identified in the frequency analysis (e.g., 75 percent dentate AND 25 percent cord wrapped stick decoration in the first band). Exemplars are used for illustrative purposes and to help in describing the variable patterns. Cluster descriptions are provided in Appendix D: Clustering Solution Details.

Equally Weighted Discussion

Equally weighted variable clustering generated a bootstrap validated seven cluster solution. Individual analysis of each cluster reveals marked trends, for example Cluster 1 represents cord wrapped stick decoration, Cluster 3 dentate, Cluster 4 pseudo-scallop shell, Cluster 5 other decorative tools, and Clusters 6 and 7 represent different plain vessels. These clusters demonstrate stylistic and size homogeneity, whereas trends in shape or technological variables are not as notable yet still present. Hence there is a definite stylistic bias to these clusters. This is further confirmed by the statistical

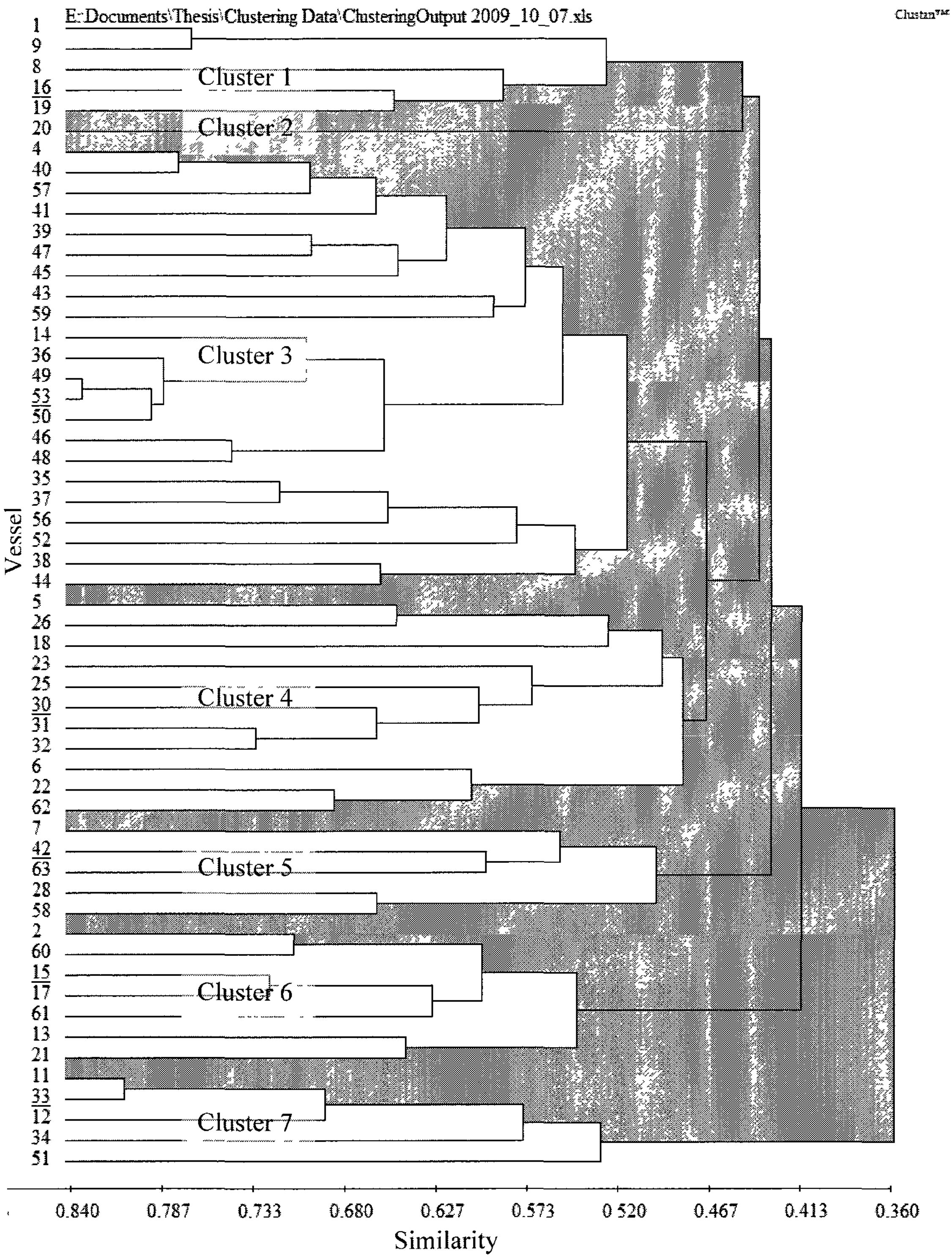


Figure 12. Dendrogram for Equally Weighted Attributes (Gower's Coefficient and UPGMA clustering).

Cluster 1	Cluster 2	Cluster 3		Cluster 4	Cluster 5	Cluster 6	Cluster 7
1	20	4	45	5	7	2	11
8		14	46	6	28	13	12
9		35	47	18	42	15	33
16		36	48	22	58	17	34
19		37	49	23	63	21	51
		38	50	25		60	
		39	52	26		61	
		40	53	30			
		41	56	31			
		43	57	32			
		44	59	62			

Table 17. Equally Weighted Variables Cluster Membership (Exemplars in bold)

associations between cluster membership and attributes and variable combinations, (Appendix E: Associations Between Cluster Membership and Attributes, Table 49) whereby there is a significant reduction of errors (i.e., above 0.25, or a 25 percent reduction) for nearly all stylistic variables. This correlation means that if cluster membership is known, the decoration can be predicted and vice-versa. Temper type and size, wall thickness and vessel diameter, are all also significantly correlated to cluster membership.

The summative characteristics for each cluster are listed in Table 18. The results of this clustering solution are intriguing as they demonstrate potential associations between the Kitchikewana assemblage and other regional pottery manifestations. On a general level the overall assemblage may not naturally fall within a neat definition, however the results of this cluster analysis present a different picture. In fact, the equally weighted clustering solution has some interesting correlations to other archaeological

Cluster	Stylistic	Shape	Technological	Size
1	Delimited CWS stamped exteriors with plain interiors.	Convex lips, rim exteriors are not concave.	Smoothed interior and exterior.	Thinner rims with thicker lips.
2	Delimited linear tool stamped over CWS stamped. Interior CWS stamped.	Nil	Large abundant temper.	Nil
3	Dentate in all areas with stamping being common. Notably drag-stamp, rocker-stamp and push-pull techniques.	Concave exterior rim profiles and some castellation.	Combed body interiors, ochre wash possible	Nil
4	Stamped PSS tool on the exterior, lip, and, when decorated, the interior	Convex exterior rim profiles	Smoothed interiors	Thinner lips and smaller rim diameter.
5	Plain lips with linear, dentate, or annular tool decoration elsewhere.	Complex, i.e., pointed, lip form	Interiors variable but typically not combed, larger than average temper	Thinner lips and smaller rim diameter paired with thick bodies and rims
6	Entirely plain exteriors or no second band and no delimiters. Plain interiors. If the exterior is decorated, the tool is CWS or cord in the first band.	Nil	Some textured exteriors with wiped interiors. Grit Type 6 temper common	Nil
7	Plain vessels, however delimiters are present.	Nil	Wiped exteriors, interiors wiped or combed. Large quantities of fine temper	Thick lipped, thick rimmed vessels with larger than average circumferences

Table 18. Summary of the Notable Characteristics for the Equally Weighted Variable Clusters

Note: CWS = cord wrapped stick, PSS = pseudo-scallop shell manifestations, particularly to Curtis's well defined Point Peninsula temporal phases for the Rice Lake area (see Table 19). A southeastern correlation for southern Georgian Bay pottery is also noted by Dodd and Lennox (1996:143) at the Baxter site near Port Severn.

Cluster	Middle Woodland Affiliation
1	Late Point Peninsula
2	Late Point Peninsula
3	Middle Point Peninsula
4	Early Point Peninsula
5	Saugeen (unknown era)
6	Late Point Peninsula
7	Unknown

Table 19. Summary of Equally Weighted Cluster Affiliations

Based on the diagnostics noted by Curtis (2004b:217-225) we can tentatively correlate Cluster 4 to her Trent Phase, based on the co-occurrence of pseudo-scallop shell stamping, thin everted lips and a slight preference for oblique configurations. Likewise, Cluster 3 is similar to the Rice Lake Phase with dentate decoration, combed surface treatments, and an increased frequency of drag-stamp, rocker-stamp, and push-pull stamping techniques. There are also some similarities between Curtis' Sandbanks Phase and Cluster 1 (frequent delimitation and cord wrapped stick stamping in oblique right or horizontal configurations) and Cluster 6 (cord wrapped stick decoration and texturing of exterior surfaces).

However, there are differences from Curtis's definitions, such as the Sandbanks Phase commonly having plain first exterior decorative bands which, along with

Sandbank's notably textured surface treatments, Cluster 1 lacks. Undecorated first bands do appear in Cluster 7 along with frequent delimitation, however the only decoration is on the lip and second bands are also plain. If we turn to tradition connections, while most of these clusters seem to be aligning with the Point Peninsula tradition, Cluster 5, with larger temper sizes and thicker walls, falls into the possible Saugeen definition, as defined in Appendix C. However, given the critique of the Saugeen division developed throughout this thesis, Cluster 5 is not a reification of Saugeen pottery as different than Point Peninsula as the possibility of other causal factors, i.e., inherent variability or idiosyncratic production, is strong. Any testing of the existence of a division in the pottery from the site along these lines is left for the Point Peninsula versus Saugeen clustering exercise.

As is seen, the equally weighted clustering finds groups of like pottery within the Kitchikewana assemblage. The correlation of these mathematically created groups to archaeologically recognized material culture groupings from the Rice Lake area suggests that these are viable constructs. From this exercise the Kitchikewana assemblage appears to be the result of multiple occupations through time, demonstrated not only by the changes in pottery style, but also by radiocarbon analysis as discussed in Chapter Two.

Further to the temporal line of interpretation, we can add the two Middle Woodland radiocarbon dates from the site that correlate to vessels in this study. The cal A.D. 805 date is from the same context as Vessel 44, which is in Cluster 4, identified here as possibly early Middle Woodland. Vessel 38, from Cluster 3, is associated with the cal A.D. 929 date. Cluster 3 is identified as Middle Point Peninsula. Both of these associated radiocarbon dates post-date the chronological ranges given by Curtis (2004b) for the corresponding phases and may suggest that pottery characteristics are slightly later developments in this area than in the Rice Lake vicinity. One other radiocarbon date will be considered here. The cal A.D. 1059 date was obtained in close, but not direct, stratigraphic association with five vessels included in this study: Vessels 15, 25, 47, 57, and 60. In terms of cluster chronology, Vessel 60 is in Cluster 5 of unknown time, Vessel 25 is in Cluster 3 from the middle, and most significantly, the other three vessels are from Cluster 6, the late period. This again roughly correlates to the radiocarbon date, and shows a similar pattern of phases as those noted by Curtis occurring at the Kitchikewana site, only slightly later in time.

Additionally, most of the ochre washed vessels (75 percent) are grouped into Cluster 3. While a small portion of the sample, it is an interesting pattern suggesting that ochre washing could have been practiced more during the Middle Point Peninsula period at Camp Kitchikewana.

The preceding temporal assignations are preliminary, yet demonstrate the mixed nature of the deposits at the site via the mixing of decorative tools and associated vessel dates within clusters. Accordingly, while the chronological pattern is interesting, extreme caution is stressed as the representativeness of these radiocarbon dates for these clusters is unknown and they could be outliers. Further direct dating of vessels or contexts containing vessels is required to authenticate these temporal hypotheses.

Point Peninsula vs. Saugeen (limited variables)

The following dendrogram (Figure 13) illustrates the clusters created using Gower's general coefficient to generate the similarity matrix for only the Point

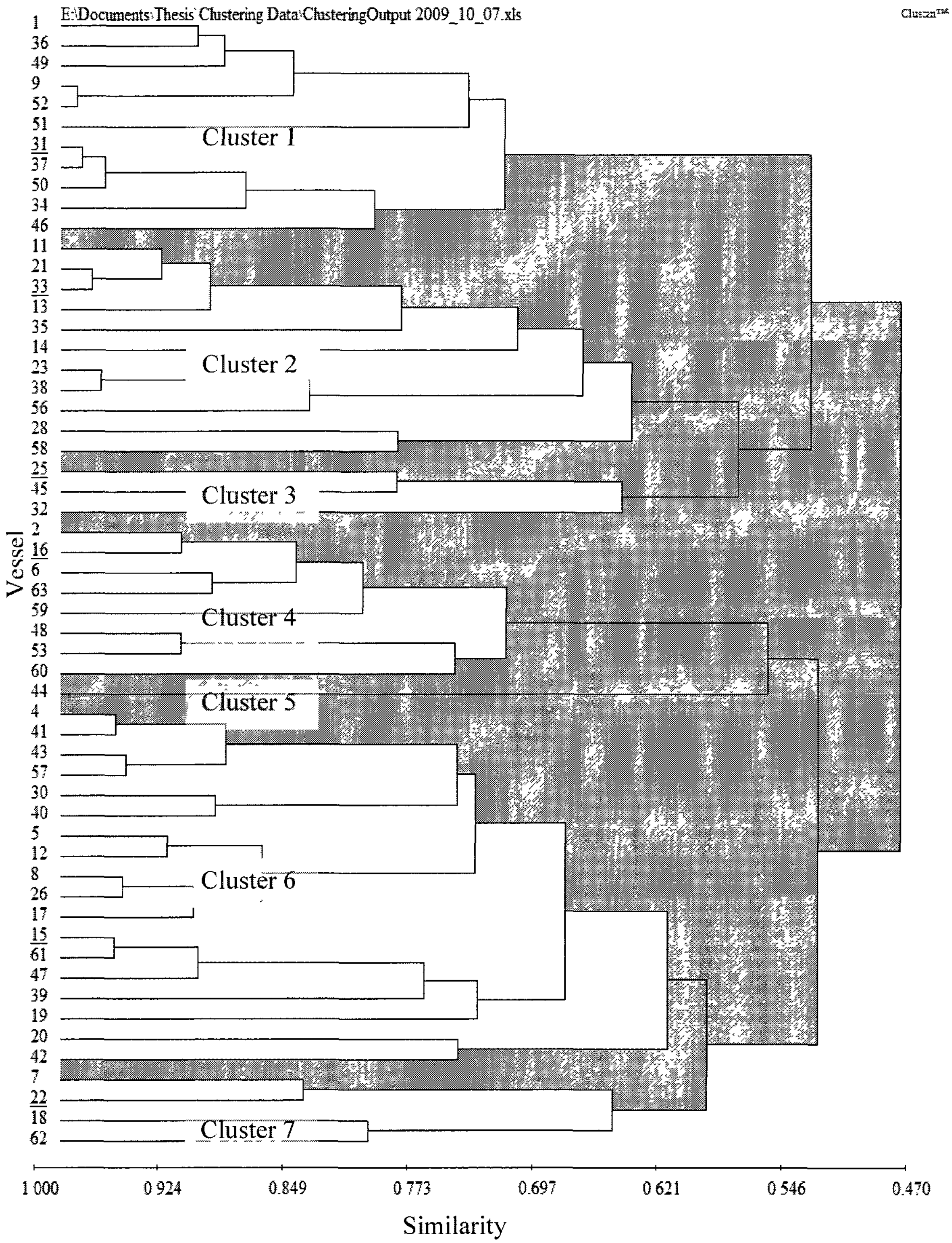


Figure 13. Dendrogram for Point Peninsula vs. Saugeen (limited variables), (Gower's Coefficient and UPGMA clustering).

Peninsula versus Saugeen variables, clustered using the unweighted pair-group method using arithmetic average (UPGMA) method. A seven cluster solution is suggested via a 120 trial bootstrap validation without replacement and was adopted as shown. Cluster membership is presented in Table 20 by vessel number.

Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	Cluster 6		Cluster 7
1	11	25	44	2	4	30	7
9	13	32		6	5	39	18
31	14	45		16	8	40	22
34	21			48	12	41	62
36	23			53	15	42	
37	28			59	17	43	
46	33			60	19	47	
49	35			63	20	57	
50	38				26	61	
51	56						
52	58						

Table 20. Point Peninsula vs. Saugeen (limited variables) Cluster Membership (Exemplars in bold)

In this clustering exercise, the traits ostensibly distinguishing Point Peninsula from Saugeen pottery (interior surface modification, lip form, temper size, body thickness, and rim thickness as per Finlayson [1977] and Spence et al. [1990:148]) are weighted at a value of 1 and are the only ones used to generate the similarity matrix and the resulting clustering solution (all other variables are weighted at a value of 0).

The discussion formulated in Appendix C did not affect the variable selection here for three reasons. Primarily, the insights from Appendix C were realized after the clustering was undertaken. Secondly, the results of this clustering, based upon the proffered characteristics, can be used to further assess their validity. Lastly, of those considered in Appendix C, only two variables (temper size and wall thickness), exhibit significant separation between the two traditions to warrant being accepted as defining characteristics. Two variables are insufficient grounds for a clustering exercise, and simply sorting and grouping based upon these criteria is a more straightforward and time effective solution. Cluster descriptions are provided in Appendix D: Clustering Solution Details.

Point Peninsula vs. Saugeen (limited variables) Discussion

Clustering using only the variables suggested to distinguish Point Peninsula from Saugeen pottery in a stylistic sense shows few differences between clusters. Conversely, lip form is differentially distributed for example, Cluster 7 represents complex lips, Cluster 6 straight lips, and Clusters 5 and 2 convex lips. This is expected given lip form is one of the variables used for the clustering. Technologically, differences in the clusters are most pronounced in the variables used in the clustering, yet not elsewhere. From this we see, for example, that Cluster 1 has combed interiors with large quantities of temper, Cluster 2 has wiped interiors, and Cluster 5 has smoothed interiors. Lastly, size variables are also divided based upon the selected variables; Cluster 7 has thinner lips and Cluster 5 has thicker walls. The notable trends, those that differ from the assemblage averages, are highlighted in Table 21.

Statistical validation of these perceived correlations is presented in Appendix E: Associations Between Cluster Membership and Attributes. The only significant reductions in errors (i.e., above 0.25, or a 25 percent reduction) are noted for lip form,

Cluster	Stylistic	Shape	Technological	Size
1	Equally delimited and non-delimited. Average decoration distributions.	Straight rim profiles.	Interiors combed, exteriors smoothed. Temper fairly average size, but in large quantities.	Slightly larger than average.
2	Some delimiters. Dentate stamp in varying configurations typically with no or plain SDB. Lips plain or stamped, tool variable.	Convex rim profiles.	Wiped or sometimes combed interiors. Exterior smoothed or wiped. Coil breaks relatively frequent. Broad temper quantities and types, fairly average size.	Nil
3	No delimiters. PSS or dentate in either stamped or drag-stamped	Straight lips, straight rim profiles.	Smoothed exteriors, interior variable. Somewhat larger temper size.	Nil
4	Single vessel. No delimiter.	Nil	Indeterminate rim surface modification. Crumbly consistency with lots of larger temper.	Larger vessel
5	Delimiters uncommon. Average decoration distributions but for notably variable tool types.	Entirely convex lips	Smoothed interiors, temper slightly larger than average.	Larger vessels
6	Delimiters present 40 percent. Average decoration distributions.	Mostly straight lips, diverging walls	Exteriors smoothed, interior bodies highly variable, but rim interiors all smoothed. Consistency leans to well-knit with medium quantities of smaller temper.	Nil
7	Single bossed example here, otherwise not delimited. Average decoration distributions.	All complex lips here.	Smoothed over most of vessel. Temper size below average.	Thin lipped, smaller vessels

Table 21. Summary of the Notable Characteristics for the Point Peninsula vs. Saugeen Variables Only Clusters.

Note: SDB = second exterior decorative band, PSS = pseudo-scallop shell interior surface modification, temper size, and vessel wall thicknesses. All other variables are not significantly correlated to clusters, nor are clusters correlated with the other variables.

Interpretation of the significance of these clusters is less intrinsic than for the equally weighted solution. Accepting for the moment the original characteristics of Point Peninsula pottery, the bases for the weighting in this analysis, there seems to be little evidence of the Saugeen pottery tradition in the sample population.

Clusters 3, 4, and 5 do exhibit some Saugeen tendencies. Conversely, even though temper sizes in Clusters 3 and 5 are larger than the Kitchikewana average, only the single vessel in Cluster 4 falls within the discussed Saugeen "larger temper size" exceeding an average of 4.0 mm. Given the revelations documented in Appendix C, that only temper size, and to a limited extent vessel wall thickness, are accurate for defining pottery assemblage affiliations, the same trends are still noted, and accepting the smaller sizes for Point Peninsula tempering, it again appears as if the majority of the pottery in this assemblage exhibits Point Peninsula tendencies.

The intent of this variable weighting was to create a clustering solution where vessels fitting the aforementioned characteristics of either the Saugeen or Point Peninsula pottery traditions would tend to be in the same group. In a sense it appears initially that the exercise has failed, because there is significant diversity within clusters, and more significantly there are no clearly Saugeen-like, or obvious Point Peninsula-like clusters.

Preferably, it should be seen as additional support for the previous equally weighted solution; there are hints of traits from the Saugeen Tradition pottery in the assemblage, e.g., larger tempering, but they are not sufficiently concentrated or in high enough frequencies to generate Saugeen-like clusters. Supporting this theory is the fact that of the Saugeen-like clusters in this solution (Clusters 3, 4, and 5), only vessel 63 is also identified in the equally weighted clustering solution as having Saugeen-like tendencies.

The connections provided in this clustering solution are weak at best. Although this solution provides insight into the Kitchikewana assemblage patterning, it does not fulfill the initial goal of providing Saugeen-like or Point Peninsula-like clusters based upon the differentiating variables, even though those variables are associated with cluster memberships. This is further evidence that the detection of Saugeen or Point Peninsula pottery in this assemblage is not as simple as following the proffered criteria, or the criteria clarified in this analysis. This is again evidence of a significant continuity in material culture across the Northeast, transcending the outdated models created over 50 years ago in a time of much more limited evidence. In fact, a lack of significant correlation to either tradition is the expected outcome in an ethnogenesis informed perspective.

CHAPTER 7: FINAL DISCUSSION AND CONCLUSION

The initial goal of this analysis was to determine if the Kitchikewana pottery assemblage is related to either the Point Peninsula or Saugeen traditions. This analysis demonstrates a blending of traditions both chronologically and spatially. So then, who made these pots? Analysis began with four potential situations:

1. The Kitchikewana assemblage is more like Point Peninsula pottery and therefore the site was likely a Point Peninsula tradition occupation.
2. The Kitchikewana assemblage is more like Saugeen pottery and therefore the site was likely a Saugeen tradition occupation.
3. There are distinct sub-sets of pottery in the assemblage that are like Saugeen pottery along with sub-sets of pottery in the assemblage like Point Peninsula pottery suggesting different occupations by people from these traditions, distinct pottery traditions in contact, but not a blending of style, technique, etc.
4. The Kitchikewana assemblage does not show strong correlations to either or the traditions.
5. The Kitchikewana assemblage shows correlations to both traditions.

However, clear bounded correlations between the Kitchikewana assemblage and the existing pottery traditions are not present, nor should they have been expected. Frequency analysis of the Kitchikewana Middle to early Late Woodland pottery assemblage, undertaken in Chapter Five, demonstrates that the collection has some curious characteristics in regards to temporal associations. Specifically there is a high incidence of delimiters akin to later period sites combined with mixed decorative tool use more common in the middle of the period. It is also demonstrated that the collection is not the result of a single pottery tradition being followed, e.g., the discrepancy between thickly walled vessels, like Saugeen pottery, and the use of very fine temper more common to Point Peninsula pottery, or the prevalence of simple stamping as a decorative technique, again a Saugeen trend, combined with a very high incidence of interior combing. The Kitchikewana pottery assemblage is therefore diverse and does not readily correspond with either Saugeen or Point Peninsula pottery. Yet, as demonstrated, it is not simply the diversity in this particular assemblage that hinders the discovery of a regional correlation, as the diversity is not unique. Attribute frequencies illustrate that there is no clear connection to one cultural tradition, nor to one temporal phase within the period, thus the question remained: *Why is there such diversity in this pottery assemblage?*

In Chapter Six, cluster analysis is used to search for patterns within the diversity of the pottery assemblage, and the results are somewhat contrary to previous findings at the site. In short, the diversity can be easily explained temporally and most of the pottery clusters from the Equally Weighted variable analysis are more akin to Point Peninsula pottery. Tentatively then, this suggests the site was occupied by people working their pottery in a very similar style to that of the groups in and around the Rice Lake area. The ease of correlation of these mathematically created groups to archaeologically recognized material culture groupings from the Rice Lake area suggests that these are viable constructs, and not simply a figment of statistical, nor archaeological, imagination. Furthermore, these are similarities noted generally at the nearby Baxter site in Port Severn (Dodd and Lennox 1996:143). The Baxter site's earlier date suggests this southeastern alignment may have some time depth. However, the similarities to Saugeen tradition pottery are readily apparent in some attributes as noted in the frequency analysis and the second clustering solution, considered further below.

This initial clustering exercise also demonstrates that the Kitchikewana assemblage is the result of multiple occupations through time. Changes in pottery style and technique, corroborated through correlations to the Rice Lake area's temporal framework and through the noted stylistic development through time in the Middle Woodland in general, help establish this chronological framework. This framework is chronology supported by the limited radiocarbon data, as discussed in Chapter Two. As noted in Chapter Six, the radiocarbon correlations hint that the Rice Lake developments occur here. Perhaps this southeastern link is related to the proximity of the Kitchikewana site to present day Port Severn, and the long extant Trent-Severn Waterway. The waterway may have provided the medium for such long range transmission of traits, in particular during this time of limited social boundaries.

Also we must note that there are, as discussed in Chapter Two, no archaeologically observed changes in the use of the site thought time in terms of feature distribution, appearance of structures, artifact distributions, etc. This suggests a relative continuity of use through time as well.

The second clustering solution, based upon the original variables believed to distinguish Point Peninsula from Saugeen, which are challenged in this analysis, provide additional support for the previous solution; there are hints of traits from Saugeen Tradition pottery in the assemblage, e.g., larger tempering, but they are not sufficiently concentrated or in high enough frequencies to generate Saugeen-like clusters.

However, I argue from my analysis of published literature that a ceramic based taxonomic division of Saugeen and Point Peninsula is at best an archaeological construct of moderately differing forms of pottery visible at a local scale. However, within a pan-regional continuum, the differences are possibly more linked to geographical distances, temporal differences, or differences in kin group based pottery decisions not reflective of differences in processes of social systems at large. Given that their similarities, including overall settlement and subsistence patterns, outweigh their differences, I believe the division of Saugeen and Point Peninsula do not retain efficacy as viable contrasting cultures or traditions within an ethnogenesis and rhizotic informed perspective. I too follow Wilsons's (1991:10) comments, and suggest these categories fall into disuse. However, I cannot condone, as Wilson does, the continued use of the terms for geographical or spatial regions as they carry with them too much baggage, and I can envision archaeology easily falling into the box trap again, inferring patterns due to inclusion in an area.

Evidence provided throughout this analysis points to an increasingly intensive occupation of the Kitchikewana site for resource processing by foraging peoples throughout the Middle Woodland period, yet fluorescing in the latter stages. The people making pottery at this site were within a continuum of pottery change from one area to another with each location having its own regional variations. This pattern suggests extensive intergroup interactions and ethnogenesis. Therefore geographically broad typological constructs have little relation to specific social groupings. The collection of pottery here demonstrates the fluidity of material culture and discounts the existing rigid taxonomic structures currently in place and commonly used. Accordingly these pots are not "pre or early Iroquoian or Algonquian". Rather they are best viewed as a regional or local manifestation of a large Middle to Late Woodland continuum.

I also find the existing culture history framework is flawed. I argue this based on Moore's (1994) critiques of both cladisitc formulations and the direct historic approach. I also critique the use of outdated concepts of ethnic identity in the past, e.g., unknown persistence of identity, lack of boundaries etc., which tie in with the flaws in identifying

Saugeen and Point Peninsula as well as transitional taxa such as Sandbanks-Princess Point-Melocheville etc. The relevance of this debate in the first place is tied to the linking either Algonquian or Iroquoian historic groups erroneously to the taxonomic boxes in existing models of the past.

I believe the temporal boxes are flawed when applied at a local level in terms of the baggage they analogously associate with transitional Late Woodland dates (such that there is no evidence at Kitchi up to A.D. 1200 of significant shifts in settlement or subsistence), the overlap of "transitional" taxa with 'static' ones, and the implied silo development model that ends up ignoring the fluidity of people/genes/ethnicity etc. throughout time, and the divergent trajectories of the various traits of social groups through time and space.

In Moore's (1994) ethnogenetic model this is best seen as a hybridized group within the broad distribution of the similar Middle Woodland pattern of subsistence, settlement, material culture, etc. The local group may share antecedents from many groups and accordingly, the concept of a border between, and indeed the existence of, the Point Peninsula and Saugeen traditions must be reassessed in light of increasing archaeological collections from the "boundary region" to further examine the validity of rigid pottery types that may be more of an artifact of the tiny portholes archaeologists look through than any kind of past social reality.

So who made these pots? From A.D. 200 to 1200 (from radiocarbon dates and avoiding taxonomic temporal boxes) at the Camp Kitchikewana site there is ample evidence of recurring group(s) of people here who are thus far identifiable as foragers. From the archaeological record there is no tangible manifestation of a transition in settlement or subsistence. The people here are participants in a pan-regional pottery tradition, manufacturing pottery locally, with similar styles, techniques, and variability found across the broad region encompassing the Saugeen and Point Peninsula pottery types. Regional pottery distinctions, during a time when there are few to no well-defined social boundaries, and especially since material culture patterning transcends ethnolinguistic or other demonstrable identity boundaries, is perhaps best related to local kin group fluctuations on a shared pan-regional pattern that shares temporal development via fluidity of the population. As Hart and Brumbach (2009) believe for New York State, locally, the group or groups occupying the site align on kinship ties. Changes in the choices made in pottery production are gradual teacher to student (in this case likely parent to child) variation (Shennan and Steele 1999). Thus Kitchikewana's pottery variability can be better understood in the aforementioned dissemination of craft specialized knowledge that the local diversity is kin based, while regional similarities arise from population fluidity.

The Kitchikewana site evidences multiple occupations over generations. Perhaps this arises from seasonal mobility, but as of yet there is insufficient evidence to fully determine seasonality and subsistence beyond occupations at least during warmer months. This is in large part the result of the poor site deposition (i.e., faunal remains lack context) and due to a lack of floral analysis thus far. Speculatively, given the current environment of the site, habitation from spring through late fall is not beyond reason, and longer term stays cannot be ruled out.

As demonstrated in Chapter 6, there are possible temporal shifts in the pottery style, and these changes are similar to those found elsewhere in the pan-regional pottery tradition. I propose a very preliminary local pottery sequence, akin to that of Curtis, for the Rice Lake area based on similarities in decorative tool use through time note by Curtis (2004b), Finlayson (1977) and others, and the few radiocarbon dates for the Kitchikewana site. The sequence is best seen in stylistic trends whereby pseudo-scallop shell decoration precedes dentate, then cord wrapped stick decorations. However, this is a small sample size encompassing a long time frame and at Kitchikewana these divisions are not clear cut and more direct dating of pottery is needed.

Linkage of the past social groups at Camp Kitchikewana to historic or current ethnolinguistic groups is not possible, but if we accept one analogy here it is for a genetic Algonquian ancestry in the region to 3000 years ago from mtDNA (Schultz Shook and Smith 2008), thus if pressed I would first say that the groups once living at Kitchikewana likely identified and organized based on kinship, but that they perhaps contributed to the genetic makeup of modern Algonquian speakers. This does not imply the A.D. 200 to 1200 people self-identified as Algonquian, spoke that language, or a single one for that matter, etc., just a possible genetic link, although this is not directly demonstrated. As proposed in New York State, an Iroquoian identity is a gradual ethnogenesis of different traits converging as the full suite of "Iroquoian-ness" that is to say matrilocality, longhouse villages, pottery traits, maize-bean-squash agriculture, not until after A.D. 1300 (Engelbrecht 1999; Hart and Brumbach 2003, 2009; Hart and Englebrecht 2011; Martin 2004, 2008).

While pottery is only one small portion of the Kitchikewana site's material culture analysis, I hope the study at hand establishes a new perspective for future analyses of archaeological data from the site. We must move beyond the rigidity of the flawed cultural-historical constructs which fail to elucidate the nature of social groups. The undoubtedly multicultural, cosmopolitan nature of past societies is lost in the boxes of culture-history, but is welcomed under ethnogenesis models of the past.

The Camp Kitchikewana site is one site based context that in the future with other sites interpreted in such a manner, can help form a more holistic local interpretation outside of the flawed culture history framework. I suggest archaeologists take comfort in local contexts and accepting that archaeology does not answer all of the questions. As Martin (2008) calls for, we should begin finding local intra-site development *processes*, likely through those few stratified sites with direct dating that can allow for a more grounded (i.e., better justified by fitting more evidence), interpretation of the past at a local level. Each refined local interpretation contributes to a larger picture, and can then be used to compare and contrast other local development processes elsewhere, but we must not get caught up in a-prior assumptions of behavioural traits or social organization from blind analogy. We must also be willing to accept the changes to the north eastern interpretive models as more evidence is uncovered and our understanding of the past develops.

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APPENDIX A: ATTRIBUTE FREQUENCIES

Notes for Appendix A

Stylistic Attributes
CWS = Cord Wrapped Stick
PSS = Pseudo-Scallop Shell
DB = Decorative Band

Technological Attributes
1 = Grit Temper 1
2 = Grit Temper 2
3 = Grit Temper 3
4 = Grit Temper 4
5 = Grit Temper 5
6 = Grit Temper 6
O=Organic
SM = Surface Modification
N/A = Not Available

Std. Deviation = Standard Deviation

Attribute	n	%
Delimiters		
Bosses	1	1.8
Punctates	9	15.8
Blank Space	9	15.8
Absent	38	66.7
Total	57	100.0
First DB Tool		
Annular	1	1.8
Cord	1	1.8
Pointed	2	3.5
No First DB	3	5.3
Linear	4	7.0
Plain	5	8.8
CWS	7	12.3
PSS	8	14.0
Dentate	26	45.6
Total	57	100.0
First DB Technique		
Drag-Stamped	3	5.3
Incised	3	5.3
Rocker-Stamped	3	5.3
No First DB	3	5.3
Plain	5	8.8
Stamped	40	70.2
Total	57	100.0
First DB Configuration		
Diamonds	1	1.8
Horizontal Difference	1	1.8
Oblique Left	1	1.8
Plaits	1	1.8
Superimposed	1	1.8
No First DB	3	5.3
Plain	5	8.8
Vertical	11	19.3
Horizontal	13	22.8
Oblique Right	20	35.1
Total	57	100.0

Attribute	n	%
Second DB Tool		
Annular	1	1.8
Cord	1	1.8
Linear	2	3.5
Pointed	2	3.5
Plain	4	7.0
CWS	7	12.3
PSS	7	12.3
No Second DB	11	19.3
Dentate	22	38.6
Total	57	100.0
Second DB Technique		
Incised	3	5.3
Plain	4	7.0
Push-Pull	4	7.0
Drag-Stamped	6	10.5
Rocker-Stamped	6	10.5
No Second DB	11	19.3
Stamped	23	40.4
Total	57	100.0
Second DB Configuration		
Zig-Zag	1	1.8
Plain	4	7.0
Horizontal Difference	5	8.8
Oblique Right	11	19.3
No Second DB	11	19.3
Horizontal	12	21.1
Vertical	13	22.8
Total	57	100.0
Interior Decorative Tool		
Annular	1	1.8
Crescent	1	1.8
CWS	1	1.8
Pointed	1	1.8
Linear	2	3.5
PSS	3	5.3
Dentate	17	29.8
Plain	31	54.4
Total	57	100.0

Table 22. Stylistic Attribute Frequencies

Attribute	n	%
Interior Decorative Technique		
Incised	1	1.8
Rocker-Stamped	5	8.8
Drag-Stamped	10	17.5
Stamped	10	17.5
Plain	31	54.4
Total	57	100.0
Interior Decorative Configuration		
Oblique Left	1	1.8
Horizontal	2	3.5
Oblique Right	8	14.0
Vertical	15	26.3
Plain	31	54.4
Total	57	100.0
Lip Decorative Tool		
Pointed	3	5.3
Linear	6	10.5
PSS	7	12.3
CWS	9	15.8
Plain	9	15.8
Dentate	23	40.4
Total	57	100.0
Lip Decorative Technique		
Drag-Stamped	1	1.8
Incised	1	1.8
Push-Pull	1	1.8
Plain	9	15.8
Stamped	45	78.9
Total	57	100.0
Lip Decorative Configuration		
Punctates	2	3.5
Horizontal	4	7.0
Oblique Left	5	8.8
Plain	9	15.8
Vertical	15	26.3
Oblique Right	22	38.6
Total	57	100.0

Table 22. Stylistic Attribute Frequencies continued.

Attribute	n	%
Lip Form		
Concave	1	1.8
Complex	7	12.3
Convex	23	40.4
Straight	26	45.6
Total	57	100.0
Wall Orientation		
Thickened Lip	5	8.8
Parallel	8	14.0
Diverging	11	19.3
Converging	33	57.9
Total	57	100.0
Exterior Rim Profile		
Concave	17	29.8
Straight	17	29.8
Convex	23	40.4
Total	57	100.0
Interior Rim Profile		
Concave	10	17.5
Straight	16	28.1
Convex	31	54.4
Total	57	100.0
Rim Orientation		
Insloping	1	1.8
Everted Lip	2	3.5
Vertical	10	17.5
Outflaring	44	77.2
Total	57	100.0
Castellation		
Incipient	2	3.5
Uncastellated	55	96.5
Total	57	100.0

Table 23. Shape Attribute Frequencies

Attribute	n	%
Temper Type		
1+3+O	1	1.8
1 + 2	1	1.8
4 + 1 + 3	1	1.8
4 + 1 + 5	1	1.8
4 + 5	1	1.8
4 + S	1	1.8
4	1	1.8
5 + 1	1	1.8
5	1	1.8
5 + Pottery	1	1.8
Unknown	1	1.8
4 + 1	2	3.5
1 + 6	4	7.0
3	4	7.0
1 + 3	5	8.8
6	6	10.5
1	25	43.9
Total	57	100.0
Temper Quantity		
Small	6	10.5
Medium	21	36.8
Large	22	38.6
Extra-Large	7	12.3
N/A	1	1.8
Total	57	100.0
Consistency		
Crumbly		
Laminated	7	12.3
Chunky	13	22.8
Intermediate	14	24.6
Well-Knit	19	33.3
Total	57	100.0

Attribute	n	%
SM-Rim Exterior		
Combed	1	1.8
Indeterminate	2	3.5
Textured	2	3.5
Wiped	6	10.5
Smoothed	46	80.7
Total	57	100.0
SM-Body Exterior		
Indeterminate	1	1.8
Superimposed	1	1.8
Combed	2	3.5
Textured	2	3.5
Wiped	10	17.5
Smoothed	41	71.9
Total	57	100.0
SM-Rim Interior		
Indeterminate	1	1.8
Combed	12	21.1
Wiped	13	22.8
Smoothed	31	54.4
Total	57	100.0
SM-Body Interior		
Superimposed	2	3.5
Indeterminate	3	5.3
Smoothed	13	22.8
Wiped	14	24.6
Combed	25	43.9
Total	57	100.0
Ochre Washed		
Present	4	7.0
Absent	53	93.0
Total	57	100.0
Coil Evidence		
Present	16	28.6
Absent	40	71.4
Total	56	100.0

Temper Particle Size	
n	56
Mean	2.7 mm
Standard Deviation	1.0 mm
Range	4.7 mm

Table 24. Technological Attribute Frequencies

Attribute	n	%	Size (mm)
Lip Thickness	56		
Mean			7.0
Std. Deviation			1.5
Range			8.1
Rim Thickness	56		
Mean			7.9
Std. Deviation			1.6
Range			6.3
Body Thickness	56		
Mean			8.5
Std. Deviation			1.8
Range			8.3
Rim Diameter	56		
Mean			204.1
Std. Deviation			30.3
Range			130.0
Rim Diameter Coded			
Large (250-299 mm)	5	8.9	
Med (200-249 mm)	29	51.8	
Small (150-199 mm)	21	37.5	
Extra-Small (100-149 mm)	1	1.8	
Total	56	100.0	

Table 25. Size Attribute Frequencies and Averages

APPENDIX B: VARIABLE COMBINATIONS

Stylistic Variable Combinations

Given the high levels of association between tool, technique, and configuration for any of the decorative areas, a combination of tool + technique + congifuration was adopted for each decorative area. Tool type also had higher values no matter which areas were being compared, and thus a combined variable of first exterior decorative band tool + second exterior decorative band tool + lip tool + interior tool was adopted. Conversely, configuration and technique only had higher levels of association when comparing the two exterior decorative bands, thus the combined variables first exterior decorative band technique + second exterior decorative band technique, and first exterior decorative band configuration + second exterior decorative band configuration were created.

Notes for Appendix B:

FDB = First exterior decorative band
SDB = Second exterior decorative band
PSS = Pseudo-Scallop Shell
CWS = Cord Wrapped Stick
DB = Decorative Band

1st Variable	2nd Variable	1st Dependent	2nd Dependent
FDB Tool	FDB Technique	0.321	0.598
FDB Tool	FDB Configuration	0.381	0.324
FDB Technique	FDB Configuration	0.531	0.271
SDB Tool	SDB Technique	0.517	0.540
SDB Tool	SDB Configuration	0.488	0.488
SDB Technique	SDB Configuration	0.503	0.475
Lip Tool	Lip Technique	0.273	0.746
Lip Tool	Lip Configuration	0.344	0.384
Lip Technique	Lip Configuration	0.736	0.292
Interior Tool	Interior Technique	0.643	0.611
Interior Tool	Interior Configuration	0.632	0.710
Interior Technique	Interior Configuration	0.568	0.634
FDB Tool	SDB Tool	0.555	0.512
FDB Tool	Lip Tool	0.536	0.536
FDB Tool	Interior Tool	0.363	0.347
SDB Tool	Lip Tool	0.367	0.460
SDB Tool	Interior Tool	0.251	0.260
Lip Tool	Interior Tool	0.307	0.247
FDB Technique	SDB Technique	0.397	0.262
FDB Technique	Lip Technique	0.078	0.102
FDB Technique	Interior Technique	0.147	0.120
SDB Technique	Lip Technique	0.082	0.126
SDB Technique	Interior Technique	0.122	0.187
Lip Technique	Interior Technique	0.035	0.053
FDB Configuration	SDB Configuration	0.252	0.293
FDB Configuration	Lip Configuration	0.078	0.123
FDB Configuration	Interior Configuration	0.100	0.185
SDB Configuration	Lip Configuration	0.116	0.120
SDB Configuration	Interior Configuration	0.069	0.117
Lip Configuration	Interior Configuration	0.053	0.053

Table 26. Stylistic Goodman and Kruskall's *Tau* Values

Tool	Technique	Configuration	n	%
Annular	Stamped	Horizontal	1	1.8
Cord	Stamped	Horizontal	1	1.8
CWS	Stamped	Plaits	1	1.8
Dentate	Drag-Stamped	Vertical	1	1.8
Dentate	Rocker-Stamped	Horizontal	1	1.8
Dentate	Rocker-Stamped	Vertical	1	1.8
Dentate	Stamped	Superimposed	1	1.8
Linear	Incised	Horizontal	1	1.8
Linear	Stamped	Oblique Left	1	1.8
Linear	Stamped	Oblique Right	1	1.8
Linear	Stamped	Vertical	1	1.8
Pointed	Incised	Diamonds	1	1.8
Pointed	Incised	Oblique Right	1	1.8
PSS	Drag-Stamped	Oblique Right	1	1.8
PSS	Drag-Stamped	Vertical	1	1.8
PSS	Rocker-Stamped	Vertical	1	1.8
PSS	Stamped	Horizontal Difference	1	1.8
PSS	Stamped	Vertical	1	1.8
CWS	Stamped	Oblique Right	2	3.5
No DB	No DB	No DB	3	5.3
PSS	Stamped	Oblique Right	3	5.3
CWS	Stamped	Horizontal	4	7.0
Dentate	Stamped	Horizontal	5	8.8
Dentate	Stamped	Vertical	5	8.8
Plain	Plain	Plain	5	8.8
Dentate	Stamped	Oblique Right	12	21.1

Table 27. Frequencies of Combined FDB Variables of Tool, Technique, and Configuration.

Tool	Technique	Configuration	n	%
Annular	Stamped	Horizontal	1	1.8
Cord	Stamped	Horizontal	1	1.8
CWS	Stamped	Vertical	1	1.8
CWS	Stamped	Zig-Zag	1	1.8
Dentate	Drag-Stamped	Horizontal	1	1.8
Dentate	Drag-Stamped	Horizontal Difference	1	1.8
Dentate	Drag-Stamped	Oblique Right	1	1.8
Dentate	Rocker-Stamped	Horizontal	1	1.8
Dentate	Stamped	Vertical	1	1.8
Linear	Incised	Horizontal Difference	1	1.8
Linear	Stamped	Horizontal Difference	1	1.8
PSS	Rocker-Stamped	Vertical	1	1.8
PSS	Push-Pull	Oblique Right	1	1.8
CWS	Stamped	Oblique Right	2	3.5
Dentate	Stamped	Horizontal	2	3.5
Pointed	Incised	Oblique Right	2	3.5
PSS	Stamped	Horizontal Difference	2	3.5
CWS	Stamped	Horizontal	3	5.3
Dentate	Drag-Stamped	Vertical	3	5.3
Dentate	Push-Pull	Vertical	3	5.3
PSS	Stamped	Horizontal	3	5.3
Dentate	Rocker-Stamped	Vertical	4	7.0
Plain	Plain	Plain	4	7.0
Dentate	Stamped	Oblique Right	5	8.8
No SDB	No DB	No DB	11	19.3

Table 28. Frequencies of Combined SDB Variables of Tool, Technique, and Configuration.

FDB Technique	SDB Technique	n	%
Drag-Stamped	Drag-Stamped	1	1.8
Drag-Stamped	Push-Pull	1	1.8
Drag-Stamped	Stamped	1	1.8
Incised	Incised	2	3.5
Incised	No DB	1	1.8
No DB	No DB	3	5.3
Plain	Plain	4	7.0
Plain	Rocker-Stamped	1	1.8
Rocker-Stamped	No DB	1	1.8
Rocker-Stamped	Rocker-Stamped	2	3.5
Stamped	Drag-Stamped	5	8.8
Stamped	Incised	1	1.8
Stamped	No DB	6	10.5
Stamped	Push-Pull	3	5.3
Stamped	Rocker-Stamped	3	5.3
Stamped	Stamped	22	38.6

Table 29. Frequencies of Combined FDB and SDB Technique.

FDB Configuration	SDB Configuration	n	%
Diamonds	No DB	1	1.8
Horizontal	Horizontal	2	3.5
Horizontal	Horizontal Difference	1	1.8
Horizontal	No DB	5	8.8
Horizontal	Oblique Right	4	7.0
Horizontal	Zig-Zag	1	1.8
Horizontal Difference	Horizontal Difference	1	1.8
No DB	No DB	3	5.3
Oblique Left	Vertical	1	1.8
Oblique Right	Horizontal	8	14.0
Oblique Right	Horizontal Difference	2	3.5
Oblique Right	Oblique Right	5	8.8
Oblique Right	Vertical	5	8.8
Plain	Plain	4	7.0
Plain	Vertical	1	1.8
Plaits	No DB	1	1.8
Superimposed	Vertical	1	1.8
Vertical	Horizontal	2	3.5
Vertical	Horizontal Difference	1	1.8
Vertical	No DB	1	1.8
Vertical	Oblique Right	2	3.5
Vertical	Vertical	5	8.8

Table 30. Frequencies of Combined FDB and SDB Configuration

Interior Tool	Interior Technique	Interior Configuration	n	%
Annular	Stamped	Horizontal	1	1.8
Crescent	Drag-Stamped	Vertical	1	1.8
CWS	stamped	oblique right	1	1.8
Dentate	Drag-Stamped	Oblique Left	1	1.8
Dentate	Drag-Stamped	Oblique Right	2	3.5
Dentate	Drag-Stamped	Vertical	4	7.0
Dentate	Rocker-Stamped	Horizontal	1	1.8
Dentate	Rocker-Stamped	Vertical	3	5.3
Dentate	Stamped	Oblique Right	2	3.5
Dentate	Stamped	Vertical	4	7.0
Linear	Drag-Stamped	Vertical	1	1.8
Linear	Stamped	Vertical	1	1.8
Plain	Plain	Plain	31	54.4
Pointed	Incised	Oblique Right	1	1.8
PSS	Drag-Stamped	Oblique Right	1	1.8
PSS	Rocker-Stamped	Vertical	1	1.8
PSS	Stamped	Oblique Right	1	1.8

Table 31. Frequencies of Combined Interior Variables of Tool, Technique, and Configuration.

Lip Tool	Lip Technique	Lip Configuration	n	%
CWS	Stamped	Oblique Left	1	1.8
CWS	Stamped	Oblique Right	7	12.3
CWS	Stamped	Vertical	1	1.8
Dentate	Drag-Stamped	Oblique Right	1	1.8
Dentate	Stamped	Horizontal	3	5.3
Dentate	Stamped	Oblique Left	2	3.5
Dentate	Stamped	Oblique Right	11	19.3
Dentate	Stamped	Vertical	5	8.8
Dentate	Push-Pull	Vertical	1	1.8
Linear	Stamped	Oblique Left	1	1.8
Linear	Stamped	Oblique Right	2	3.5
Linear	Stamped	Vertical	3	5.3
Plain	Plain	Plain	9	15.8
Pointed	Incised	Horizontal	1	1.8
Pointed	Stamped	Punctates	2	3.5
PSS	Stamped	Oblique Left	1	1.8
PSS	Stamped	Oblique Right	1	1.8
PSS	Stamped	Vertical	5	8.8

Table 32. Frequencies of Combined Lip Variables of Tool, Technique, and Configuration.

FDB	SDB	Lip	Interior	n	%
No DB	No SDB	CWS	Plain	1	1.8
No DB	No SDB	Linear	Plain	1	1.8
No DB	No SDB	Pointed	Plain	1	1.8
Annular	Annular	Plain	Annular	1	1.8
Cord	No SDB	Linear	Plain	1	1.8
CWS	CWS	CWS	Crescent	1	1.8
CWS	CWS	CWS	CWS	1	1.8
CWS	CWS	CWS	Plain	1	1.8
CWS	CWS	Plain	Plain	2	3.5
CWS	No SDB	CWS	Plain	2	3.5
Dentate	Cord	Dentate	Dentate	1	1.8
Dentate	CWS	Dentate	Plain	1	1.8
Dentate	Dentate	Dentate	Dentate	10	17.5
Dentate	Dentate	Linear	Dentate	1	1.8
Dentate	Dentate	Dentate	Plain	7	12.3
Dentate	Dentate	Plain	Plain	1	1.8
Dentate	Linear	Linear	Plain	1	1.8
Dentate	No SDB	Dentate	Dentate	4	7.0
Linear	CWS	CWS	Linear	1	1.8
Linear	Dentate	Plain	Dentate	1	1.8
Linear	Linear	Plain	Linear	1	1.8
Linear	Pointed	Linear	Plain	1	1.8
Plain	Dentate	Pointed	Plain	1	1.8
Plain	Plain	CWS	Plain	2	3.5
Plain	Plain	Plain	Plain	2	3.5
Pointed	Pointed	Linear	Pointed	1	1.8
Pointed	No SDB	Pointed	Plain	1	1.8
PSS	Dentate	Plain	Plain	1	1.8
PSS	PSS	PSS	plain	4	7.0
PSS	PSS	PSS	PSS	3	5.3

Table 33. Frequencies of Combined Variables of Tool Type from all Vessel Areas.

Shape Variable Combinations

Shape variables tend to have weak associations, with the exception of rim profiles for the interior and exterior, which are subsequently accepted as a combined variable.

1st Variable	2nd Variable	1st Dependent	2nd Dependent
Lip Form	Rim Orientation	0.039	0.030
Lip Form	Exterior Rim Profile	0.019	0.040
Lip Form	Interior Rim Profile	0.007	0.034
Exterior Rim Profile	Interior Rim Profile	0.243	0.241

Table 34. Shape variable Goodman and Kruskall's *Tau* values

Technological Variable Combinations

While G&K *Tau* calculations identified a combination of temper type + size + quantity, upon examination of the data the correlation of these variables was revealed to be a result of the data distribution. There are so many types and combinations of temper that the frequency of each type of limited. Eleven temper types have only a single occurrence, and therefore a single size, so predictability and error reduction is high. This also explains the extreme one-sidedness of the asymmetric *tau* values (e.g., temper quantity and type with a difference of 0.217). Consequently, temper type + size + quantity is not considered further as an informative variable combination. The same is also true of any combination involving temper type because of its dispersion amongst multiple attribute states.

Overall exterior (ext.) and interior (int.) surface finishes show moderate to high levels of association and are used as combined variables, but the same is not true for interior to exterior comparisons.

1st Variable	2nd Variable	1st Dependent	2nd Dependent
Temper Size (categorical)	Temper Quantity	0.121	0.093
Temper Type	Temper Size (categorical)	0.122	0.362
Temper Quantity	Temper Type	0.299	0.082
Coil Breaks	Consistency	0.165	0.056
Temper Quantity	Consistency	0.170	0.114
Temper Size (categorical)	Consistency	0.110	0.078
Temper Type	Consistency	0.084	0.346
Exterior Body SM	Exterior Rim SM	0.501	0.591
Interior Body SM	Interior Rim SM	0.178	0.213
Interior Body SM	Exterior Body SM	0.081	0.041
Interior Rim SM	Exterior Rim SM	0.108	0.123

Table 35. Technological variable Goodman and Kruskall's *Tau* values

Exterior Rim	Exterior Body	n	%
Combed	Combed	1	1.8
Indeterminate	Textured	1	1.8
Indeterminate	Wiped	1	1.8
Smoothed	Combed	1	1.8
Smoothed	Smoothed	41	71.9
Smoothed	Wiped	4	7.0
Textured	Textured	1	1.8
Textured	Superimposed	1	1.8
Wiped	Indeterminate	1	1.8
Wiped	Wiped	5	8.8

Table 36. Frequencies of combined variables of exterior surface treatments.

Interior Rim	Interior Body	n	%
Combed	Combed	11	19.3
Combed	Wiped	1	1.8
Indeterminate	Combed	1	1.8
Smoothed	Combed	8	14.0
Smoothed	Indeterminate	3	5.3
Smoothed	Smoothed	12	21.1
Smoothed	Wiped	7	12.3
Smoothed	Superimposed	1	1.8
Wiped	Combed	5	8.8
Wiped	Smoothed	1	1.8
Wiped	Wiped	6	10.5
Wiped	Superimposed	1	1.8

Table 37: Frequencies of combined variables of interior surface treatments.

Size Variable Correlations

G&K *Tau* is intended for nominal data, and is therefore not applicable to the interval measurement data. As such, Spearman's rho is used instead. Results of the correlation calculations are presented in Table 38.

		Body Thickness (mm)	Lip Thickness (mm)	Rim Thickness (mm)	Rim Diameter (mm)
Lip Thickness	Spearman's rho	.356**			
	Sig. (2-tailed)	.007			
Rim Thickness	Spearman's rho	.589**	.410**		
	Sig. (2-tailed)	.000	.002		
Rim Diameter	Spearman's rho	.335*	.451**	.318*	
	Sig. (2-tailed)	.012	.000	.017	
Temper Size	Spearman's rho	.535**	.198	.291*	.103
	Sig. (2-tailed)	.000	.143	.029	.452

Table 38. Spearman's rho for Interval Data

Note: Sample size each attribute is 56.
Sig. = Significance
** = Correlation is significant at the 0.01 level (2-tailed).
* = Correlation is significant at the 0.05 level (2-tailed).

APPENDIX C: DEFINING MIDDLE WOODLAND POTTERY TRADITIONS

Other than geography, trends are the proffered means to judge Saugeen from Point Peninsula as the latter are believed to demonstrate more interior channelling, less overall decoration, thinner vessel walls, finer paste, a higher proportion of pointed lips, red ochre washes, and finer dentate (Finlayson 1977:630-631; Spence et al. 1990:158; Wright 1967; Wright and Anderson 1963). Generally speaking, Saugeen pottery is said to be thicker and chunkier with less technical detail paid to the application of the decoration or to surface finish, yet these are not clearly definable or quantifiable traits, making the distinctions subjective. To create a more objective base for assigning pottery to either of these traditions, the following analysis of select characteristics was undertaken.

Surface Modification

The first suggested characteristic to be examined is the incidence of interior combing. 'Combed vessel interiors' refers to striations on the inner vessel walls, typically oriented horizontally, having possibly been created by dragging a dentate tool along the surface. Researchers have used different terminology to describe interior combing, channelling, and brushing being the most common. Some confusion can arise with the use of the term 'brushing', as used by Daechsel (1981:65-66), as it can refer to wiping the interior with textiles, creating very fine striations, however Daechsel clarifies that his use is synonymous with channelling. Further, channelling in this analysis should not be confused with Emerson's (1968:4) definition to describe a "definite channel or deep concavity found upon the inside of the rim" on collared vessels. Table 39 presents the percentage of combing present in various archaeological assemblages.

Site	% Combed	Tradition	Phase	Source
Auda	.0	Point Peninsula	Sandbanks	(Curtis 2004b:305)[a]
LCP H	.0	Point Peninsula	Sandbanks	(Curtis 2004b:304)[a]
SPB 1	.0	Point Peninsula	Sandbanks	(Curtis 2004b:304)[a]
WDON	6.8	Saugeen		(Wright and Anderson 1963:45)[b]
LL	8.2	Point Peninsula	Sandbanks	(Curtis 2004b:305)[a]
SM	9.9	Point Peninsula	Rice Lake	(Curtis 2004b:305)[a]
LCP 4	11.1	Point Peninsula	Trent	(Curtis 2004b:304)[a]
Thede	14.4	Saugeen		(Finlayson 1977:85)
ESI L	15.6	Point Peninsula	Sandbanks	(Curtis 2004b:305)[a]
DON	17.7	Saugeen		(Finlayson 1977:289)
ESI A	20.1	Point Peninsula	Sandbanks	(Curtis 2004b:305)[a]
Kant	22.4	Point Peninsula	Ottawa	(Daechsel 1981:152)[c]
SDB2	24.1	Point Peninsula	Ottawa	(Daechsel 1981:74)[c]
ESI S	25.9	Point Peninsula	Rice Lake	(Curtis 2004b:305)[a]
ESI B	30.0	Point Peninsula	Trent	(Curtis 2004b:305)[a]
IHL	31.8	Saugeen		(Wright and Anderson 1963:45)[b]

Table 39. Occurrence of Interior Combing

Note: Percentages for WDON and IHL are sherd based where all others are vessel based frequencies, however this still provides an assessment of the use of combing.

ESI A = East Sugar Island Ash, ESI B = East Sugar Island Black, ESI L = East Sugar Island Sod and Loam, ESI S = East Sugar Island Shell, LCP 2 = Log Cabin Point Layer 2, LCP 4 = Log Cabin Point Layer 4, LCP H = Log Cabin Point Hearths, LL = Lakeshore Lodge, RICH = Richardson, SDB2 = Sawdust Bay-2, SM = Serpent Mounds, SPB 1 = Spillsbury Bay Layer 1-1a, IHL = Inverhuron Lucas, DON = Finlayson's Donaldson, and WDON = Wright's Donaldson.

[a] Calculated from interior finishes coded as cb = combed.
[b] Calculations are from Wright and Anderson 1963:35 and 45, where they report interior channelling at the Inverhuron site on 103 of 324 body sherds, and at the Donaldson site. 251 channelled of total of 3669 body sherds.
[c] Termed "interior brushing" in this source.

From Table 39, Saugeen Tradition sites have interiors that are combed on average 17.7 percent of the time with a range of 6.8 percent to 31.8 percent. For Point Peninsula Tradition sites, the range of interior combing occurrences is from .0 to 30.0 percent with an average of 14.0 percent. However, this includes Sandbanks Phase sites, which were not initially part of the Middle Woodland period. If the Sandbanks sites are left out, the range is 8.2 percent to 30.0 percent with an average of 20.6 percent. Thus, without the Sandbanks pottery, combed interiors are *slightl*y more frequent on Point Peninsula pottery. Of particular note here is that the Sandbanks phase is the latest one in this study, and thus this decrease in interior channelling may have chronological context associated with changing technology.

Simply examining the occurrence of combing per site suggests that the Saugeen Tradition is in fact more frequently channelled, if Sandbanks Phase sites are included, and even if they are excluded in accordance with previous opinion, Point Peninsula Tradition vessels are only slightly more channelled. However, this is not the complete picture. Firstly, the sample sizes from the sites are very different, and in fact most of the larger samples are from the Saugeen sites, and the Point Peninsula assemblages tend to be too small to provide accurate frequencies. Furthermore, if you look at just the larger samples in this table, then Saugeen is at 6.8% for Wright's Donaldson site data, 14.4% at the Thede site, 17.7% from Finlayson's Donaldson site data, and 31.8% for the Inverhuron-Lucas site, a significant amount of variation. Similarly, Point Peninsula is at 22.4% at the Kant site and 9.9% at Serpent Mounds. With such great variation, and limited sample sizes it is not possible to truly define a trend in interior surface modification.

Chi Squared testing of these distributions was undertaken to ascertain the statistical significance of the distribution of combed versus non-combed interiors. This involved tallying the overall frequency of combed versus non-combed vessel or sherds for each tradition, based upon the counts reported in the relevant literature. This presented conflicting results, as shown in Table 40. When the sherd and vessel counts from each site are merged, the results are that the Point Peninsula Tradition pottery exhibits more interior combing than Saugeen, and this difference is statistically significant at the .01 confidence level, $\chi^2(1, n = 4980) = 22.9; p > .01$, but the association of combing as an interior modification on Point Peninsula vessels is very weak, phi-squared = .0046. This is strongly influenced by the Donaldson site data from Wright, which accounts for 74% of all the data being examined.

	Saugeen		Point Peninsula	
	n	%	n	%
Combed	440	9.8	79	16.8
Not Combed	4071	90.2	390	83.2
Total	4511	100.0	469	100.0

Table 40: Frequency of Interior Combing for Saugeen and Point Peninsula Traditions

Accordingly, it is suggested that interior surface modification not be considered a defining characteristic of Point Peninsula versus Saugeen pottery until such time a further statistical analyses of larger datasets can provide more definitive conclusions.

Overall Exterior Decoration

Another indicator proffered for differentiating Saugeen and Point Peninsula assemblages is that Saugeen pottery tends to exhibit more overall exterior decoration, i.e., the entire vessel exterior is decorated (Finlayson 1977:96, 631; Wright and Anderson 1963:47). From the initial Donaldson site investigations, only 10 percent of body sherds are plain, at the Inverhuron plain body sherds are very rare at .4 percent (Wright and Anderson 1963:47). From the Thede site Finlayson finds exterior surfaces mostly decorated (1977:96); of approximately 4,000 body sherds (1977:62), only 170, or 4 percent, are plain (1977:96). While not entirely clear, given the rim sherd vessel basis for the study, it appears as if 11.4 percent of body sherds from the 1971 Donaldson site investigations are plain (Finlayson 1977:291 all undecorated sherds/sherds total). This provides an average of 6.5 percent with a range of .4 percent to 11.4 percent of exterior body sherds being plain for Saugeen sites.

Comparatively the Point Peninsula Kant site has 30.5 percent of all sherds plain on the exterior (Emerson 1955:37), and 49 percent of body sherds are plain at the Sawdust Bay-2 site (Daechsel 1981:52). Unfortunately the neither data provided electronically by Curtis (personal communication 2007) nor published by her included information allowing these calculations.

While overall exterior decoration is an early trait in the Point Peninsula sequence, it does decrease through time (Wright 1999b:663), and the greater incidence on the Saugeen sites reported here could in fact be a temporal influence, especially given the Early Woodland affinities of the Donaldson site. Thus, overall decoration does not occur more frequently in Point Peninsula assemblages, but rather is a common trait of both traditions, with a somewhat higher frequency in the Saugeen assemblages.

Wall Thickness

Wall thickness is also held as an indicator of pottery tradition affiliation with Point Peninsula pottery having thinner vessel walls, but this statement is not clarified in terms of thinner overall or only at the rim, lip, or body, or to what extent they differ. Accordingly, all available measures were tabulated and the wall thicknesses are presented in Table 41, and summarized by tradition in Table 42, demonstrating that the ranges do overlap, but there is indeed a trend for Saugeen pottery to be moderately thicker in all vessel areas, but most notable so in body thickness.

Vessel wall thickness is therefore considered to be somewhat indicative of tradition affiliation, but not to the extent beyond identifying it as a trend for Saugeen to be thicker walled. The differences between the two traditions, in particular the overlapping of the ranges, make the resolution of a single defining thickness characteristic for either tradition impractical.

Temper Size

Temper particle size is one of the most noted and readily observable defining characteristics, with Saugeen vessels tending to have much larger particles. It, along with the aforementioned sloppiness, is one of the earliest noted traits for what would become known as Saugeen Tradition pottery (Wright and Anderson 1963:47).

Curtis finds that most temper in her study of Point Peninsula pottery is of medium size, unfortunately she uses relative sizing for temper particles, and her results are not readily comparable to those from the other sites. At Sawdust Bay-2, Daechsel (1981:57) finds an overall average temper size of 2.71 mm, with a range of 1 to 10 mm, but there is only a single vessel with temper larger than 7 mm, thus a more accurate

Site	x̄ Lip Thickness	Lip Thickness Range	x̄ Rim Thickness	Rim Thickness Range	x̄ Body Thickness	Body Thickness Range	Trad.	Source
DON	6.2	2.0-11.0	8.5	5.0-14.0	8.3	5.0-16.0	Saug	(Finlayson 1977:293)
Thede	5.7	2.0-10.0	8.3	4.0-12.0	9.0	6.0-14.0	Saug	(Finlayson 1977:86)
WDON	...	...	8.7	...	9.3	4.0-16.0	Saug	(Wright and Anderson 1963:47)
IHL	...	...	...	...	10.2	6.0-14.0	Saug	(Wright and Anderson 1963:47)
ESI B	3.7	.0-6.1	6.7	3.6-13.2	7.6	3.7-12.7	P.P.	(Curtis 2004b:328)
LCP 4	4.6	2.2-8.5	5.6	3.8-8.7	6.6	4.1-9.9	P.P.	(Curtis 2004b:327)
ESI S	4.6	2.2-8.6	7.0	5.0-10.0	7.6	3.7-11.2	P.P.	(Curtis 2004b:328)
SM	5.6	2.0-9.8	7.1	3.3-11.8	7.7	4.3-11.1	P.P.	(Curtis 2004b:328)
Auda	5.8	4.0-8.1	6.5	4.2-8.3	...	...	P.P.	(Curtis 2004b:328)
ESI A	6.4	3.8-9.9	7.8	4.2-12.0	7.9	5.3-12.7	P.P.	(Curtis 2004b:328)
ESI L	6.2	2.5-9.3	8.1	4.7-13.2	7.3	4.4-10.0	P.P.	(Curtis 2004b:328)
LCP H	4.7	1.6-7.7	6.1	5.5-7.3	6.5	2.9-11.6	P.P.	(Curtis 2004b:327)
LL	6.8	4.1-12.0	7.6	4.4-11.0	7.2	3.0-14.0	P.P.	(Curtis 2004b:328)
SPB 1	5.7	3.5-10.6	8.3	6.2-11.4	6.1	3.0-11.4	P.P.	(Curtis 2004b:327)
Kant	...	...	6.3	...	8.9	...	P.P.	(Daechsel 1981:95)
SDB2	...	...	7.0	6.0-8.0	8.6	5.0-12.0	P.P.	(Daechsel 1981:54 and 95)

Table 41. Comparative Vessel Wall Thickness (mm)

Notes: ESI A = East Sugar Island Ash, ESI B = East Sugar Island Black, ESI L = East Sugar Island Sod and Loam, ESI S = East Sugar Island Shell, LCP 2 = Log Cabin Point Layer 2, LCP 4 = Log Cabin Point Layer 4, LCP H = Log Cabin Point Hearths, LL = Lakeshore Lodge, SDB2 = Sawdust Bay-2, SM = Serpent Mounds, SPB 1 = Spillsbury Bay Layer 1-1a, IHL = Inverhuron Lucas, DON = Finlayson's Donaldson, and WDON = Wright's Donaldson.
Trad. = Tradition, P.P. = Point Peninsula, Saug. = Saugeen

Tradition	$\bar{x}$ Lip Thickness	$\bar{x}$ Lip Thickness Range	$\bar{x}$ Rim Thickness	$\bar{x}$ Rim Thickness Range	$\bar{x}$ Body Thickness	$\bar{x}$Body Thickness Range
Saugeen	6.0	2.0-11.0	8.5	4.0-14.0	9.2	4.0-16.0
Point Peninsula	5.4	.0-12.0	7.0	3.3-13.2	7.5	2.9-14.0

Table 42. Average Sherd Thickness and Range by Tradition (mm)

range (eliminating the outlier) is 1 to 7 mm. He also reports for the Kant site an average temper size of 2.69 mm (Daechsel 1981:95 average of rim, decorated and undecorated body sherd temper sizes). For Point Peninsula Tradition pottery there is a range of temper particle size of 1 to 7 mm, with the average falling in the smaller end of that spread, at about 2.7 mm. Although based upon limited data, this concurs with Ritchie and MacNeish (1949:100), who note for their Point Peninsula 2 Focus relatively fine temper particle sizes ranging from 1 to 3 mm.

Temper particle size for the Finlayson's Saugeen sites is recorded as an average, and a maximum average. Unfortunately, he does not expand on the differences between these two measures, or how they were obtained. At the Donaldson site, average temper size is <1 to 2 mm, and the maximum is 1 to 17 mm with an overall average of 4.3 mm. The Thede site is similar with an average of <1 to 2 mm and a max range of 1 to 11 mm and an overall average of 4.9 mm. Given that Finlayson (1977:631) and Wright and Anderson (1963:47) define Saugeen, in large part as a contrast to Point Peninsula, as having larger temper particle size, i.e., over 4.0 mm, it is likely that the maximum range and overall average are better representations of the temper size for the Saugeen vessels.

Saugeen Tradition pottery has a wide range of temper particle size of 1 to 17 mm, with an average of 4.6 mm. This is indeed a much broader range than for Point Peninsula, and nearly twice the average particle size. As such the trend for Saugeen pottery to have larger temper particles is deemed valid, and in fact vessels or sherds with any particles exceeding 7 mm could be considered Saugeen vessels, as could assemblages with averages over 4 mm.

Lip Form

Lip form, in particular pointed lips, are listed as a trait more common to Point Peninsula pottery (Spence et al. 1990:148). Occurrence of different lip forms was tabulated for a collection of sites, as shown in Table 43.

It is very interesting to note the paucity of complex, i.e., pointed, lips from Curtis's sites. This is a total of 358 Middle Woodland, Point Peninsula vessels, of which only one has a complex, i.e., pointed, lip. However, complex lips are more common at the Sawdust Bay-2 site, possibly indicating either a temporal or geographic particularity to pointed lip use. Thus, from this data the notable characteristic is that Saugeen pottery tends to have a slightly higher incidence of complex, i.e., pointed, lips, and it appears only rarely on Point Peninsula pottery. And perhaps it is more temporal, coinciding with earlier occupations, as with the Sawdust Bay 2 site and as previously noted possibly early dates for the Donaldson site.

Sloppy Decoration

Possibly one of the strongest arguments for defining Saugeen vs. Point Peninsula pottery comes in the highly subjective statements that Saugeen pottery is more crudely,

Site	Complex (%)	Concave (%)	Convex (%)	Straight (%)	Tradition	Source
SM	.8	.8	30.8	67.7	P.P.	(Curtis 2004b:290)
ESI S			55.6	44.4	P.P.	(Curtis 2004b:290)
LCP 4			44.4	55.6	P.P.	(Curtis 2004b:289)
ESI B			77.3	22.7	P.P.	(Curtis 2004b:290)
Auda			3.4	96.6	P.P.	(Curtis 2004b:290)
LCP H			54.4	45.5	P.P.	(Curtis 2004b:289)
SPB 1		6.3	37.5	56.3	P.P.	(Curtis 2004b:289)
LL		3.3	40.0	56.7	P.P.	(Curtis 2004b:290)
ESI L		12.8	56.4	30.8	P.P.	(Curtis 2004b:290)
ESI A		5.0	62.5	32.5	P.P.	(Curtis 2004b:290)
SDB2	12.9		70.0	16.7	P.P.	(Daechsel 1981:71)
Thede	15.0		44.0	40.7	Saugeen	(Finlayson 1977:88)
DON	5.7		66.6	27.7	Saugeen	(Finlayson 1977:292)

Table 43. Lip Form Frequencies

Note: P.P. = Point Peninsula

Donaldson and Thede site terminology is "Flat, Rounded, Pointed, and Asymmetrically Pointed". These are equivalent to attribute states Straight, Convex, Complex, and again Complex respectively. Accordingly pointed and asymmetrically pointed are amalgamated.

For the Sawdust Bay-2, Daechsel's terminology is "straight, rounded, or squared", equivalent to straight, convex, and straight again. Daechsel provides no comment for his type 3, which here is interpreted as complex based upon his profile drawing.

or sloppily decorated with chunkier tools and more variable motifs (Finlayson 1977:631; Wright 1999b:633; Wright and Anderson 1963:47).

Because coding would have been very subjective, and biased by the coders' personal experiences with varying levels of crudity and sloppiness, these traits were not used in this analysis. However, as the diversity analysis shows, the sloppy aspects of Saugeen pottery, in particular the lack of controlled motif, create assemblages quantifiably more diverse in variables related to motif. Therefore diversity analysis is likely a more robust technique for identifying Saugeen pottery's sloppy applications and sloppiness is indeed could be a valid characteristic for differentiating the traditions.

Ochre Wash

Spence et al., state for Point Peninsula pottery "occasionally a red ochre wash is added" (1990:148). This statement doesn't seem to hold true when examining the referenced sources of Finlayson or Wright and Anderson (Finlayson 1977:630-631; 1963). A literature survey failed to find empirical support for ochre washing as an exclusively non-Saugeen trait. References to ochre washing are rare and all seem to point back to Wright's volume on the Laurel Tradition where he accounts for multiple ochre washed vessels along the northern shore of Lake Superior, in particular from the Heron Bay site (1967:11-17). Thus they seem to be less of a Point Peninsula trait, and more common to Laurel pottery. No evident references to occurrences of ochre wash on Point Peninsula pottery could be found (including Jenneth Curtis, personal communication 2007). Thus, the absence or presence of an ochre wash will not, in this analysis, be considered definitive evidence of affiliation to a pottery tradition. Furthermore, it is apparently an absence of ochre washing from the limited number of known and documented Saugeen sites that seems to be at the foundation of this premise, and indeed the correlation may be a false one based on a lack of looking for such a surface treatment during the analysis of the Saugeen site data.

Summary

Objective assessment of the characteristics used to differentiate Saugeen from Point Peninsula pottery finds only increased wall thickness, larger temper size, and sloppier decoration to be possible defining aspects of a Saugeen pottery tradition. Surface modification, overall exterior decoration, lip form, and ochre washing are all discounted and should not be used as indicators of Saugeen or Point Peninsula pottery as they could be temporal or sampling bias based trends, where any trends exist.

APPENDIX D: CLUSTERING SOLUTION DETAILS

Equally Weighted Variables

The following section examines stylistic, shape, technological, and size attribute frequencies for each cluster generated from the equally weighted variable clustering procedure.

Cluster 1 (n=5). All vessels in Cluster 1 are delimited, either with blank spaces (60 percent [n=3]) or punctates (40 percent [n=2]), and are all decorated in both the first and second bands. Exterior decoration is always stamped, and is typically cord wrapped stick (80 percent [n=4] in both exterior bands). Configuration is mainly horizontal (80 percent [n=4]) or sometimes oblique right (60 percent [n=3]).

Vessel interiors are predominately plain (80 percent [n=4]). Lip decoration in this cluster is variable between plain and simple stamped (40 percent [n=2] and 60 percent [n=3] respectively). When stamped, configuration varies between horizontal, oblique left, and oblique right (20 percent [n=1] each) cord wrapped stick or dentate (40 percent [n=2] and 20 percent [n=1] respectively).

Lip form for Cluster 1 tends to be convex (80 percent [n=4]), with diverging or parallel walls (40 percent [n=2] each) which are always outflaring. Interior and exterior rim profiles are variable. All vessels are uncastellated. The only shape trait that differs notably from the overall assemblage is the wall orientation. Assemblage wise, the trend is toward converging walls (58 percent [n=33]); conversely Cluster 1 has no vessels with converging walls.

None of the vessels in Cluster 1 exhibit an ochre wash. Exterior surfaces are all smoothed while interiors are equally smoothed or combed on the body (40 percent [n=2] each). Temper type in this Cluster varies, however one third (n=2) of all the Grit Type 6 tempered vessels are clustered here. Furthermore, this Cluster includes the only vessel exhibiting Grit Type 2 temper (mixed with Type 1) and the one vessel exclusively tempered with Type 5. Mean temper size is 2.7 mm and the quantity is evenly distributed across all categories. Coil breaks are not typically present (80 percent [n=4] absent) and fabric consistency is always well-knit.

Generally, vessels in Cluster 1 have thicker than average lips ($\bar{x}$=8.0 mm) on thinner than average rims ($\bar{x}$=6.9 mm). Transitioning into the body, thickness increases (to $\bar{x}$=8.1 mm) and matches that of the lip. Rim diameter is slightly smaller than average ($\bar{x}$=202 mm). This average size profile differs from the assemblage average in that it is thinnest at the rim, not at the lip.

Cluster 2 (n=1). Cluster 2 is a single member cluster composed of vessel 20. This vessel is delimited with punctates, decorated in the first band and interior with a vertically stamped linear tool, and the second band with stamped cord wrapped stick, also in a vertical configuration. Lip decoration is oblique right linear tool stamped.

The Cluster 2 vessel is well above average for all measures of size. The body and rim are relatively thick (11.5 and 11.2 mm), compared to the thinner lip (10.0 mm).

Cluster 3 (n=22). Most of the vessels in Cluster 3 do not exhibit form delimitation, but some use of blank space is present (18 percent [n=4]). The first bands are all decorated with a dentate tool, typically stamped (95 percent [n=95]) and configured oblique right (55 percent [n=12]). Second bands are typically dentate tool decorated (73 percent [n=16]) but the configuration varies (32 percent [n=7] vertical, 27 percent [n=6] horizontal, 18 percent [n=4] oblique right), as does the technique (36 percent [n=8] stamping, 23 percent [n=5] drag-stamping, 14 percent [n=3] rocker-stamping). The five incidents of drag-stamped are 83 percent of all the drag stamping in the second exterior decorative band. Interestingly, four (18 percent) vessels in this cluster have no second decorative band, a phenomena that occurs only in Cluster 6 as well (all vessels in Cluster 6 have no second decorative band). Interiors are typically decorated, and when they are it is always with a dentate tool. Configuration on the interior is typically in a vertical orientation (41 percent [n=9]) or sometimes oblique right (18 percent [n=4]). Technique varies between drag-stamped, stamped, and rocker-stamped (32 percent [n=7], 23 percent [n=5], and 14 percent [n=3] respectively). The drag-stamping present in this cluster accounts for 70 percent of all interior and 83 percent of second exterior decorative band drag-stamping. Every vessel in Cluster 3 exhibits lip decoration. Dentate is the most common tool type (95 percent [n=21]), technique is typically stamped (91 percent [n=20]), and configuration is often oblique right (59 percent [n=13]).

Lip form is straight (50 percent [n=11]) or convex (45 percent [n=10]) on typically outflaring rim (77 percent [n=17]) and walls tend to converge (59 percent [n=13]). Interestingly, this cluster contains 60 percent (n=3) of the thickened lip vessels (but that may be a result of this cluster containing more vessels). Exterior rim profiles tend to be concave (45 percent [n=10]) while interiors are convex (64 percent [n=14]). This cluster contains most (59 percent) of the concave exterior rim profiles and the smallest proportion (18 percent [n=4]) of the overall more common convex exteriors. Typical profile pairing is for concave exteriors with convex interiors (41 percent [n=9]), or straight exterior and interior (18 percent [n=4]). Of further note is that both of the castellated vessels included in the clustering exercise are in this cluster.

Cluster 3 contains 75 percent (n=3) of all the ochre washed vessels. Surface modification, as with the other clusters, tends to be smoothed on the exterior (body 73 percent [n=16], rim 86 percent [n=19]), however some wiping is present (body 18 percent [n=4], rim 9 percent [n=2]). Conversely, body interiors are commonly combed (73 percent [n=16]), with some appearance of wiping (32 percent [n=7]), while rims are more commonly smoothed (45 percent [n=10]), still with some appearance of combing (32 percent [n=7]). Grit Type 1 or mixed tempers with Grit Type 1 account for all but two vessels that are tempered with Grit Type 3. The quantity of temper ranges in the medium to large categories and particle size averages 2.8 mm. The presence/absence ratio for coil evidence is similar to that of the overall assemblage (absent 67 percent [n=14]). Similarly, consistency in this cluster models that of the assemblage, with chunky and intermediate being most common.

Cluster 3 vessels have a size profile matching the overall assemblage: thinner lip ($\bar{x}$=6.9 mm) on a thicker rim ($\bar{x}$=8.0 mm), on an even thicker body ($\bar{x}$=8.6 mm). Rim diameter is medium ($\bar{x}$=205.5 mm), and categorical dispersion also mirrors that for the overall assemblage.

Cluster 4 (n=11). Cluster 4 vessels are typically not delimited (83 percent [n=9]). First decorative bands tend to be decorated with a pseudo-scallop shell tool (55 percent [n=6]) and stamped (55 percent [n=6]), with either oblique right or vertical configurations (45 percent [n=5] and 55 percent [n=6] respectively). Second band decoration trends are again pseudo-scallop shell tool (55 percent [n=6]), stamped (45 percent [n=5]), but the configuration varies between horizontal (36 percent [n=4]), oblique right (27 percent [n=3]), vertical (18 percent [n=2]), and horizontal difference

(18 percent [n=2]). Interiors are typically decorated, with pseudo-scallop shell being the most popular tool (27 percent [n=3]); however plain interiors are prevalent (45 percent [n=5]). Interior technique is variable between rocker-stamped (18 percent [n=2]), drag-stamped (18 percent [n=2]), incised (9 percent [n=1]), and stamped (9 percent [n=1]) while the configuration is either oblique right or vertical (27 percent [n=3] each). All of the lips in this cluster are decorated, mostly with pseudo-scallop shell (55 percent [n=6]), all are stamped, and the typical configuration is vertical (64 percent [n=7]).

Straight lips (55 percent [n=6]), converging walls (73 percent [n=8]), and outflaring rims (73 percent [n=8]) are typical shape attributes for the vessels in Cluster 4. Exterior rim profiles tend to be convex (64 percent [n=7]) and interior profiles are variable. All of the vessels are uncastellated.

One vessel in Cluster 4 has been ochre washed. Exterior surfaces are exclusively smoothed, and interiors are mostly smoothed (body 40 percent [n=2] and rim 64 percent [n=7]). Temper quantity is medium and is predominately Grit Type 1 (82 percent [n=9]). Temper particle size is smaller than the overall assemblage ($\bar{x}$=2.31 mm). Coils are mostly absent (73 percent [n=8]) and consistency is intermediate or well-knit (46 percent [n=5] each).

Vessels in Cluster 4 are very similar in size to the assemblage average with the exception of rim diameter, which tends to be smaller ($\bar{x}$=197.3 mm).

Cluster 5 (n=5). Vessels in Cluster 5 are not typically delimited, however one vessel exhibits bosses (the only one in the assemblage). First bands are highly variable, with different combinations on all vessels, however there are slight preferences for vertical orientation (40 percent [n=2]) and linear tool (40 percent [n=2]). Notably, Cluster 5 includes the single example of annular tool decoration. Second band decoration is again variable with dentate (60 percent [n=3]), linear (20 percent [n=1]), and annular tools all present (20 percent [n=1]), with varying configurations and techniques. Most interiors are drag-stamped (20 percent [n=1]) or stamped (40 percent [n=2]) with the same tool used in the second band. Interior configuration is vertical (40 percent [n=2]) or horizontal (20 percent [n=1]). All lips are plain.

The most remarkable trait for the shape attributes of Cluster 5 is the trend for lip form to be complex (i.e., pointed) (60 percent [n=3]), 43 percent of all complex lips. The remaining attributes follow the assemblage norms: converging walls (100 percent [n=5]), outflaring or vertical rim orientations (40 percent [n=2] each), convex interior with either convex or concave exterior rim profiles (40 percent [n=2] for both combinations), and a lack of castellations. Rim profile combinations are equally concave or convex exteriors (n=2 [40 percent]) both with convex interiors.

Cluster 5 has no ochre washed vessels. All vessels are smoothed on their exteriors while interior treatment varies, but tends not to be combed (20 percent [n=1]). Tempering does not show any strong trends in quantity nor type, but the mean size is above average ($\bar{x}$=3.97 mm). Consistency is chunky (60 percent [n=3]) or intermediate (40 percent [n=20]) and coil absence/presence is relative similar (absent 60 percent [n=3]).

Cluster 5 is notable due to the larger differences in thickness between the thin lips ($\bar{x}$=5.2 mm) in this cluster and the relatively thick rims ($\bar{x}$=8.3) and even thicker bodies ($\bar{x}$=9.4). This cluster has the greatest differences in these measures, with an increase in average thickness from lip to rim of 4.2 mm. Rim diameter for Cluster 5 is the smallest, 22 cm smaller than average ($\bar{x}$=182.0 mm). Cluster 5 includes thin lipped, smaller circumference vessels with thick bodies and rims (i.e., thick-walled, smaller vessels).

Cluster 6 (n=7). Similar to the overall assemblage, Cluster 6 vessels are not generally delimited (86 percent [n=6]). Three (43 percent) vessels are entirely plain on the exterior (having no delimiter, these vessels are described as having no decorative bands), while the remainder have first bands but no second band. First bands are stamped with cord or cord wrapped stick (43 percent [n=3]), or are incised in diamonds with a pointed tool (14 percent [n=1]). The use of plaits (see Chapter Three: Stylistic Variables for details) is also present (the only instance of these latter two configurations). All vessels in Cluster 6 are plain on the interior. Lips are all stamped with linear (29 percent [n=2]), cord wrapped stick (43 percent [n=3]), or pointed tools (29 percent [n=1]) in vertical (14 percent [n=1]), oblique right (57 percent [n=4]), or punctate (29 percent [n=2]) configurations, with the pointed tool corresponding to the punctate configuration. Stylistically, Cluster 6 represents non-delimited, plain interior, and at least partially plain exterior vessels. When decoration occurs it includes less common configurations (diamonds and plaits).

Cluster 6 shape attributes are very similar to those of the overall assemblage. Convex or straight lips, converging walls, outflaring rims, and variable interior and exterior rim profiles mirror the overall attribute frequencies; however this cluster has a tendency for concave exteriors with convex interiors (57 percent [n=4]). All of the vessels are uncastellated.

No vessels in Cluster 6 are ochre washed. Exterior surfaces tend to be smoothed (43 percent [n=3]), yet some texturing (29 percent [n=2]), wiping and superimposing (both 14 percent [n=1]) is present. Interior body surfaces are commonly wiped (57 percent [n=4]) while the rims are smoothed (71 percent [n=5]). Tempering does not show any strong trends in quantity, nor size. Conversely, temper type for this cluster is remarkable because most of the vessels are exclusively Grit Type 6 tempered (57 percent [n=4]), accounting for 67 percent of Type 6 tempered vessels. Consistency tends to be well-knit (54 percent [n=4]) and coil breaks are not common (absent 71 percent [n=5]).

Cluster 6 shows very little variation between lip, rim, and body thickness averages ($\bar{x}$=7.9, 7.5, 8.0 mm respectively), however, rim thickness is quite variable in this cluster (s=1.9 mm). Rim diameter is slightly larger than average ($\bar{x}$=208.6 mm).

Cluster 7 (n=5). All of the vessels in Cluster 7 are delimited with punctates and are undecorated in the first band. A single vessel has vertical rocker-stamped dentate decoration in the second band. All vessel interiors are plain. Lips are commonly plain (40 percent [n=2]) or stamped with oblique right cord wrapped stick (40 percent [n=2]), or horizontally incised with a pointed tool (20 percent [n=1]). In short, Cluster 7 represents plain vessels with punctate delimiters.

Cluster 7 vessels tend to follow the overall assemblage shape frequencies. Convex or straight lips, converging or diverging walls, outflaring rims, and variable interior and exterior rim profiles mirror the overall attribute frequencies. Rim profile pairings tend to be the same from exterior to interior with two (40 percent) each convex interior and exterior and straight interior and exterior. Again, all of the vessels are uncastellated.

Cluster 7 exhibits no ochre washed vessels. Notably divergent from the other clusters, vessel exteriors tend to be wiped (80 percent [n=4]), and some combing appears (20 percent [n=1]). Interiors are equally wiped or combed (40 percent [n=2]). Temper is present in large quantities and particle size is smaller than average ($\bar{x}$=2.2 mm). Grit Type 1 is the temper of choice for this cluster, found in three vessels (60 percent), and the one exclusively Type 4 tempered vessel is clustered here too. Consistency is laminated or well-knit (40 percent [n=2] each) and coil breaks are generally not present (absent 80 percent [n=4]).

While there is very little variation between the average lip, rim, and body thickness ($\bar{x}$= 8.0, 8.4, and 8.3 mm respectively), there is substantial variation around each mean (lip s=1.1 mm, rim s=1.3 mm, and body s=1.5 mm). Lips and rims tend to be thicker than average, and the mean rim diameter ($\bar{x}$=222.0 mm) is 18 mm larger than average. Cluster 7 includes thick lipped, thick rimmed vessels with larger than average circumferences (i.e., larger vessels).

Stylistically Weighted Variables

The following dendrogram (Figure 14) was generated using Gower's general coefficient to compute the similarity matrix, then clustered using the unweighted pair-group method using arithmetic average (UPGMA) clustering method. A four cluster solution is suggested via a 120 trial bootstrap validation without replacement and was adopted as shown. Cluster membership is presented in Table 44 by vessel number. In this clustering exercise, stylistic variables (delimiters; first, second, interior, and lip

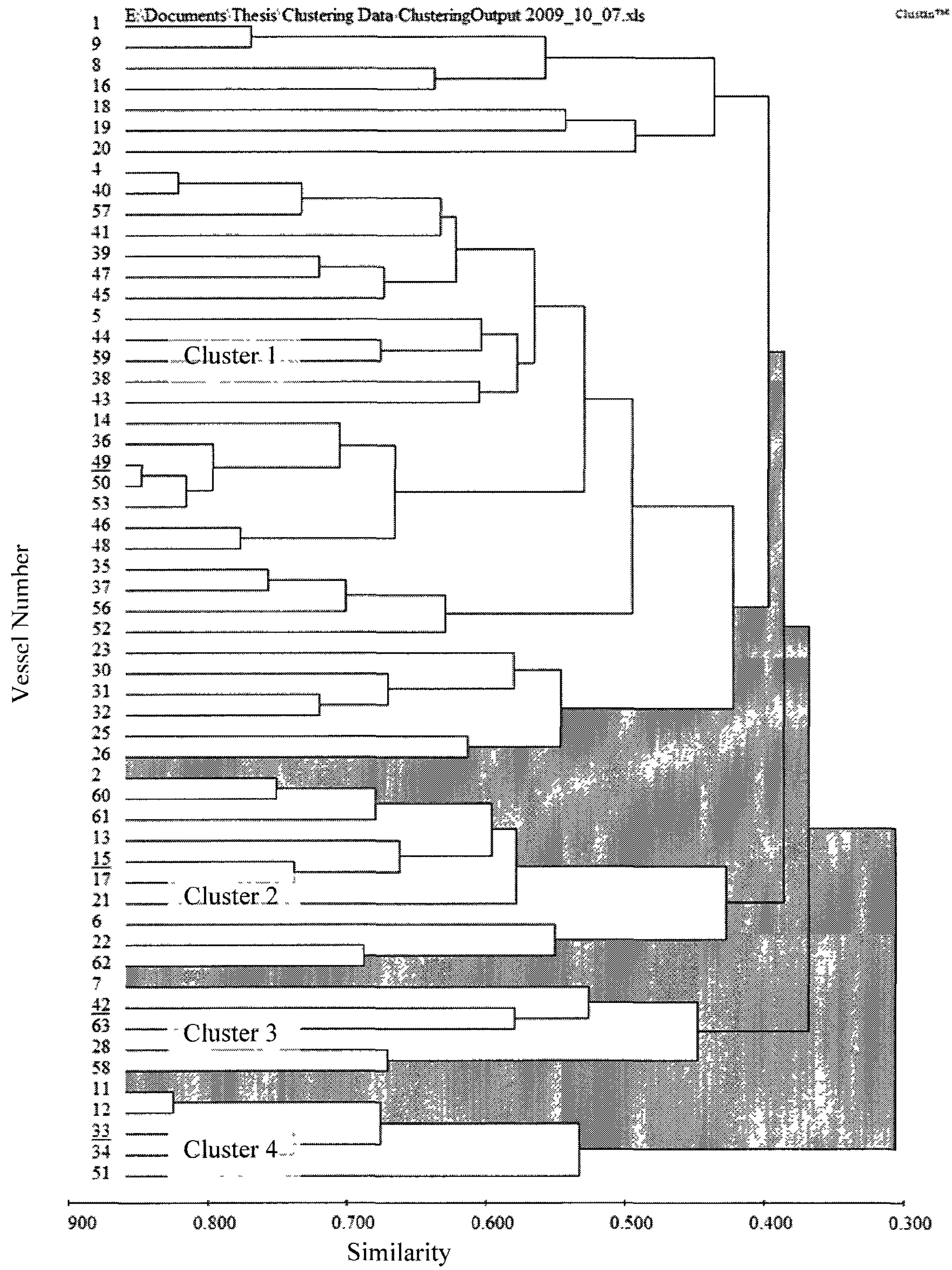


Figure 14. Dendrogram for Stylistically Weighted Variables (Gower's Coefficient and UPGMA clustering).

Cluster 1		Cluster 2	Cluster 3	Cluster 4
1	37	2	7	11
4	38	6	28	12
5	39	13	42	33
8	40	15	58	34
9	41	17	63	51
14	43	21		
16	44	22		
18	45	60		
19	46	61		
20	47	62		
23	48			
25	49			
26	50			
30	52			
31	53			
32	56			
35	57			
36	59			

Table 44. Stylistically Weighted Variable Cluster Membership (Exemplars in bold)

decorative band tool, technique and configuration) were assigned a weight of 2, while all other variables remained at a weight of 1.

Comparison of the membership of these clusters with those resulting from the equal weighting of variables reveals similarities requiring exploration and limiting the usefulness of this particular weighting method. First, this exercise has identified two clusters identical to that from the equal weighted clustering. Stylistic weighted Clusters 3 and 4 are the same as equally weighted Clusters 5 and 7, respectively. Furthermore stylistic Cluster 2 is nearly identical to equally weighted Cluster 6, the difference being the addition of 3 vessels (all from Cluster 4 in the equally weighted exercise). Thus, Cluster 1 here is an amalgam of the equally weighted Clusters 1, 2, 3 and 4.

To assess the legitimacy of stylistically weighted clustering versus equally weighted clustering, a brief attribute comparison of stylistic Cluster 2 with equal Cluster 6 was undertaken. Cluster 2 is almost stylistically identical to equally weighted Cluster 6, with the exception that the former has greater variability in first decorative band tool and there is the addition of vessels with decoration in the second band (equally weighted Cluster 6 is notable for no decoration in the second exterior decorative band). Shape, technological, and size attribute frequency distributions for both clusters are very similar.

Stylistic Cluster 1, containing 64 percent (n=36) of the assemblage, exhibits a great deal of variability stylistically (e.g., multiple tools are in this cluster: dentate, PSS, and cord wrapped stick decoration). Through equally weighted clustering, these different tools are separated into different clusters; clusters recognized statistically though bootstrap validation.

As previously noted, the function of cluster analysis is to find groupings of similar cases. Unnecessary variability within a cluster is therefore counterproductive, as the goal is to decrease or minimize in-cluster variation. One way to decrease the in-cluster variation is to subjectively implement a greater number of clusters. This would create smaller clusters, with inherently less variability, but the method for this analysis is to objectively base the number of clusters on the bootstrap validation results. For that reason, changing the number of clusters is rejected.

In summary, validated stylistic clustering generated four clusters, thee of which are almost identical to those discerned via the equally weighed clustering. Furthermore, there is a great deal of stylistic variability within Cluster 1. Therefore, stylistic weighting is abandoned from further discussion with the general conclusion that equally weighted clustering provides a validated seven cluster solution with some of the same clusters and more homogenous (i.e., better) ones.

Stylistic Only

The following dendrogram (Figure 14) was created using Gower's general coefficient to generate the similarity matrix, with stylistic variables only, then clustered using the unweighted pair-group method using arithmetic average (UPGMA) method. A six cluster solution is suggested via a 120 trial bootstrap validation without replacement and was adopted as shown. Cluster membership is presented in Table 44 by vessel number. In this clustering exercise, stylistic variables (delimiters; first, second, interior, and lip decorative band tool, technique and configuration) were the only variables used, all equally weighted at a value of 1.

Comparison of the membership of these six clusters with those resulting from the equal weighting of variables reveals similarities requiring brief exploration and limiting the usefulness of this particular weighting method.

A brief examination and comparison of cluster membership helps assess the analytical potential of the stylistic variable only clustering. Surprisingly, given that this exercise is predicated upon *only* stylistic variables, there is little separation of these in the outcome. Cluster 6 is in fact rather stylistically heterogeneous. As with the stylistically weighted solution discussed above, if the clusters were further divided

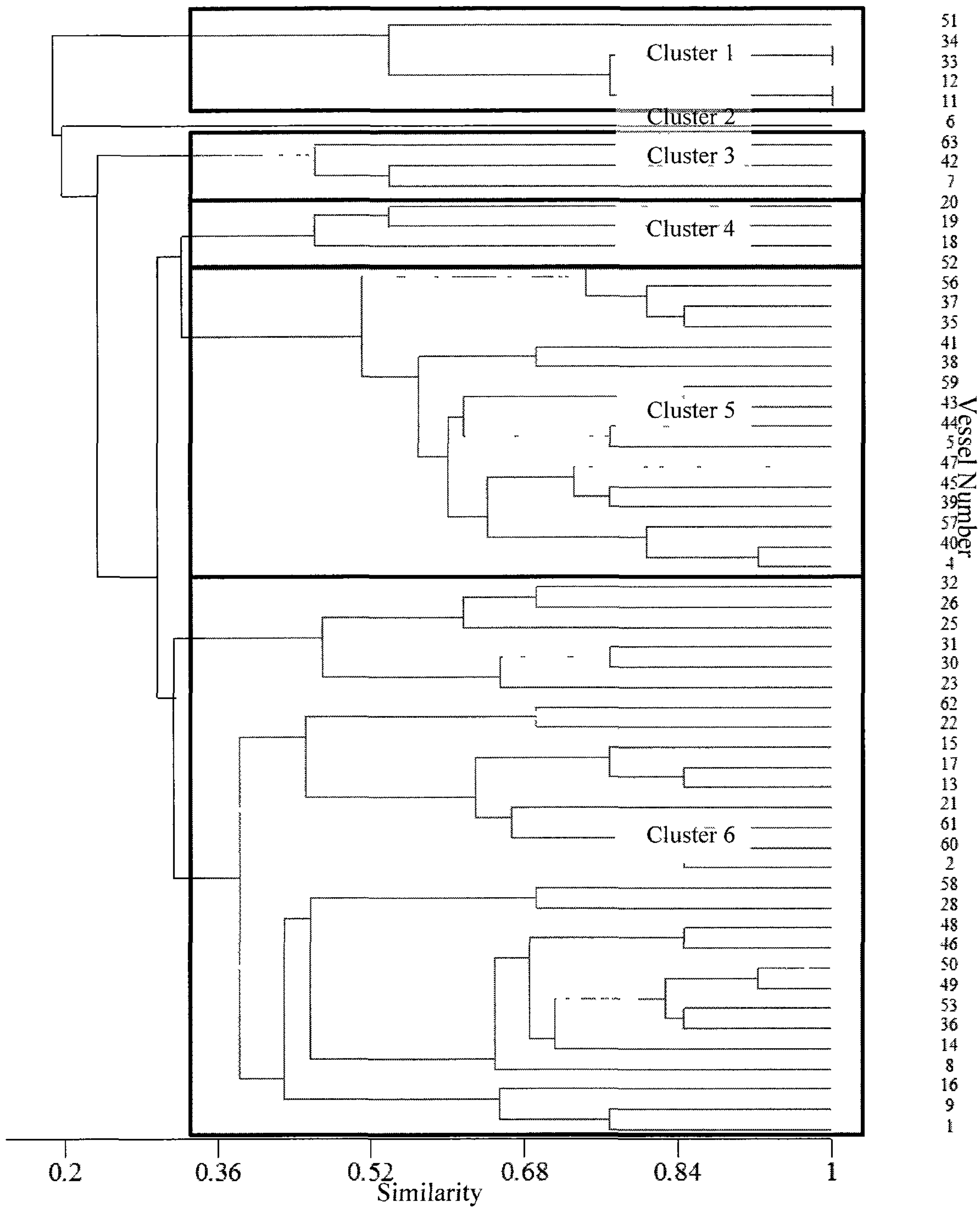


Figure 15. Dendrogram for Only Style Variables (Gower's Coefficient and UPGMA clustering).

Note: Figure 25 differs from the other dendrograms as it was created using *MVSP 3.13r* (Kovach 2005)(Kovach 2005)(Kovach 2005)(Kovach 2005), as *Clustangraphics8* was experiencing transient difficulty drawing this dataset.

Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	Cluster 6	
11	6	7	18	4	1	28
12		42	19	5	2	30
33		63	20	35	8	31
34				37	9	32
51				38	13	36
				39	14	46
				40	15	48
				41	16	49
				43	17	50
				44	21	53
				45	22	58
				47	23	60
				52	25	61
				56	26	62
				57		
				59		

Table 45. Only Stylistic Variables Cluster Membership

Technological Only

The following dendrogram (Figure 16) was generated using Gower's general coefficient to compute a similarity matrix, using only the technological variables, then clustered using the unweighted pair-group method using arithmetic average (UPGMA) clustering method. A nine cluster solution is suggested via a 120 trial bootstrap validation without replacement and was adopted as shown. Cluster membership is presented in Table 46 by vessel number. In this clustering exercise, technological

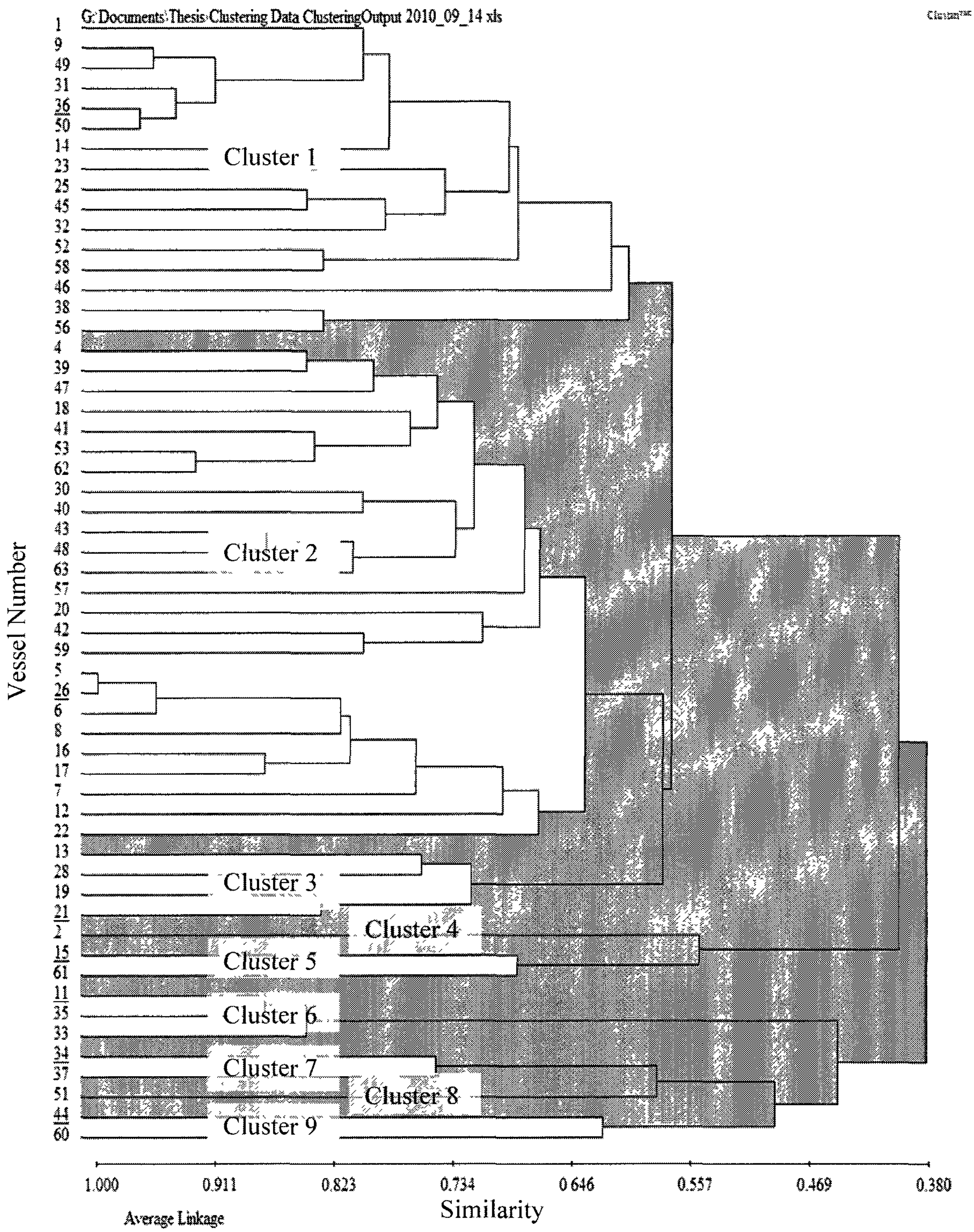


Figure 16. Dendrogram for Only Technical Attributes (Gower's Coefficient and UPGMA clustering).

Cluster 1	Cluster 2		Cluster 3	Cluster 4	Cluster 5	Cluster 6	Cluster 7	Cluster 8	Cluster 9
1	4	39	13	2	15	11	34	51	44
9	5	40	19		61	33	37		60
14	6	41	21			35			
23	7	42	28						
25	8	43							
31	12	47							
32	16	48							
36	17	53							
38	18	57							
45	20	59							
46	22	62							
49	26	63							
50	30								
52									
56									
58									

Table 46. Only Technological Variables Cluster Membership (Exemplars in bold)

variables (consistency, surface modifications, and temper type, size and quantity) were the only variables used.

Technological variable only clustering is rejected from further in-depth analysis and interpretation. Initial inspection of the attribute distributions across the clusters reveals that the larger clusters, 1 and 2, tend to be highly variable, even in the technological variables, and there are many small clusters. While bootstrap validation suggests a nine cluster solution, it also finds, unlike the other clustering solutions in this analysis, that none are of significance. The seemingly random distribution of the technological variables is also supported by the results of the Goodman and Kruskall's *Tau* tests (Appendix B: Variable Combinations) that found no significant technological variable combinations outside of surface treatments. Appreciably, this and temper size are the only significant differences between the clusters presented, however average temper size is also somewhat misleading in the smaller clusters do to the influence of such small samples.

Technologically Weighted

The following dendrogram (Figure 17) was generated using Gower's general coefficient to compute a similarity matrix using technologically weighted variables, then clustered using the unweighted pair-group method using arithmetic average (UPGMA) clustering method. A two cluster solution is suggested via a 120 trial bootstrap validation without replacement and was adopted as shown.

Cluster membership is presented in Table 47 by vessel number with *ClustanGraphics8* generated cluster exemplars are shaded and noted in bold. In this clustering exercise, technological variables (consistency, surface modification and temper type, size and quantity) were assigned a weight of 2, while all other variables remained at a weight of 1.

The technologically weighted cluster solution is also rejected for further analysis. Bootstrap validation suggests a two cluster solution and again, the similarities to the equally weighted clustering are notable. Technologically weighted Cluster 2 is a merger of Clusters 6 and 7 from the equally weighted exercise (with the subtraction of

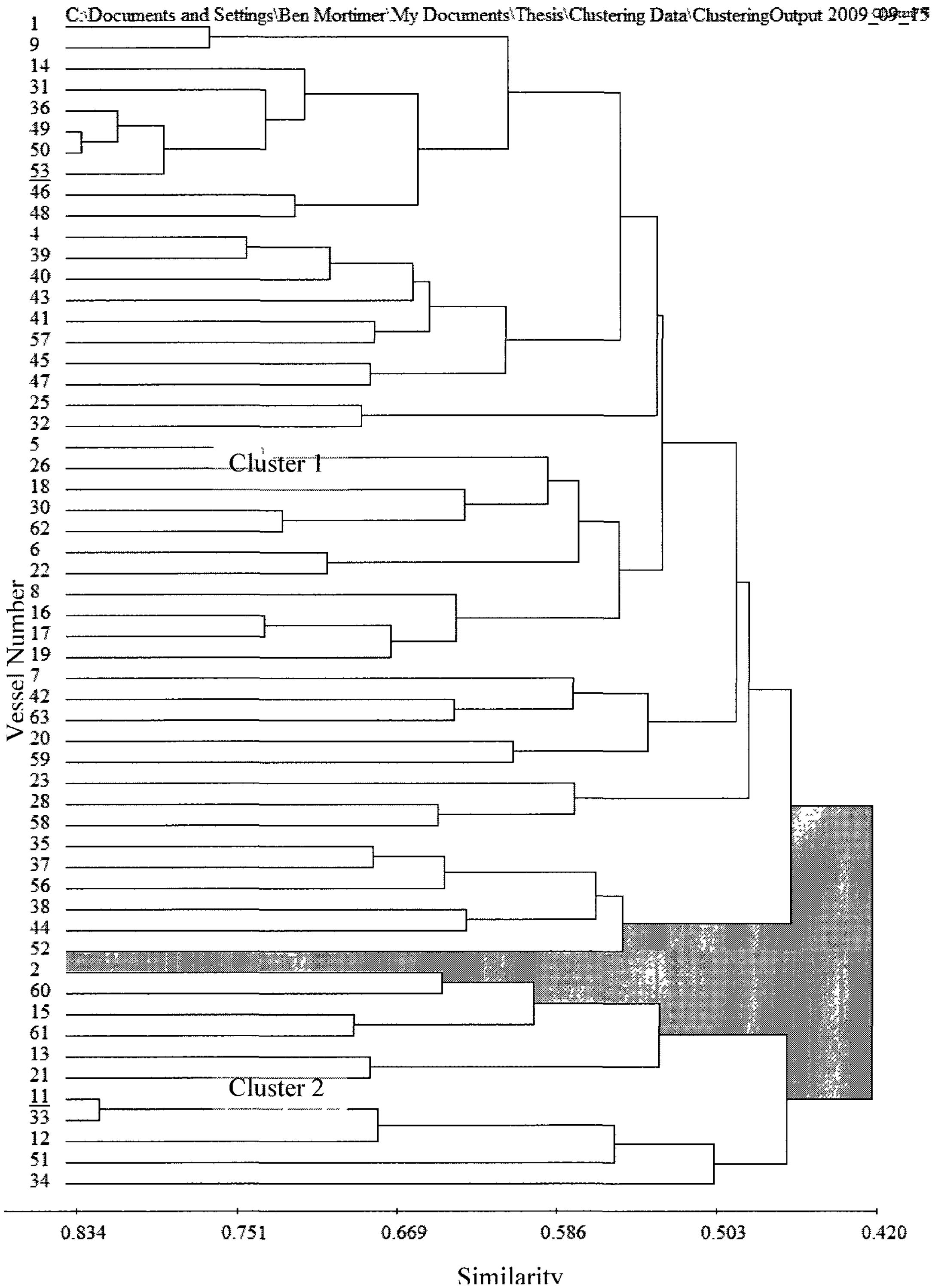


Figure 17. Dendrogram for Technologically Weighted Variables (Gower's Coefficient and UPGMA clustering).

Cluster 1			Cluster 2
1	25	44	2
4	26	45	11
5	28	46	12
6	30	47	13
7	31	48	15
8	32	49	21
9	35	50	33
14	36	52	34
16	37	53	51
17	38	56	60
18	39	57	61
19	40	58	
20	41	59	
22	42	62	
23	43	63	

Table 47. Technologically Weighted Variable Cluster Membership (Exemplars in bold)

vessel 17). Cluster 1 contains all of the other vessels, and consequently way too much variability in all aspects (style, technological, shape, and size). Technological variables appear to be of limited value in discerning clusters within the assemblage. This may indicate similar technological qualities across the assemblage, or more likely, that the differences throughout the assemblage are not obvious enough to influence the clustering at a significant enough level to create valid clusters.

Point Peninsula vs. Saugeen (all variables)

The following dendrogram (Figure 18) was generated using Gower's general coefficient to compute a similarity matrix with the Point Peninsula versus Saugeen (P.P.

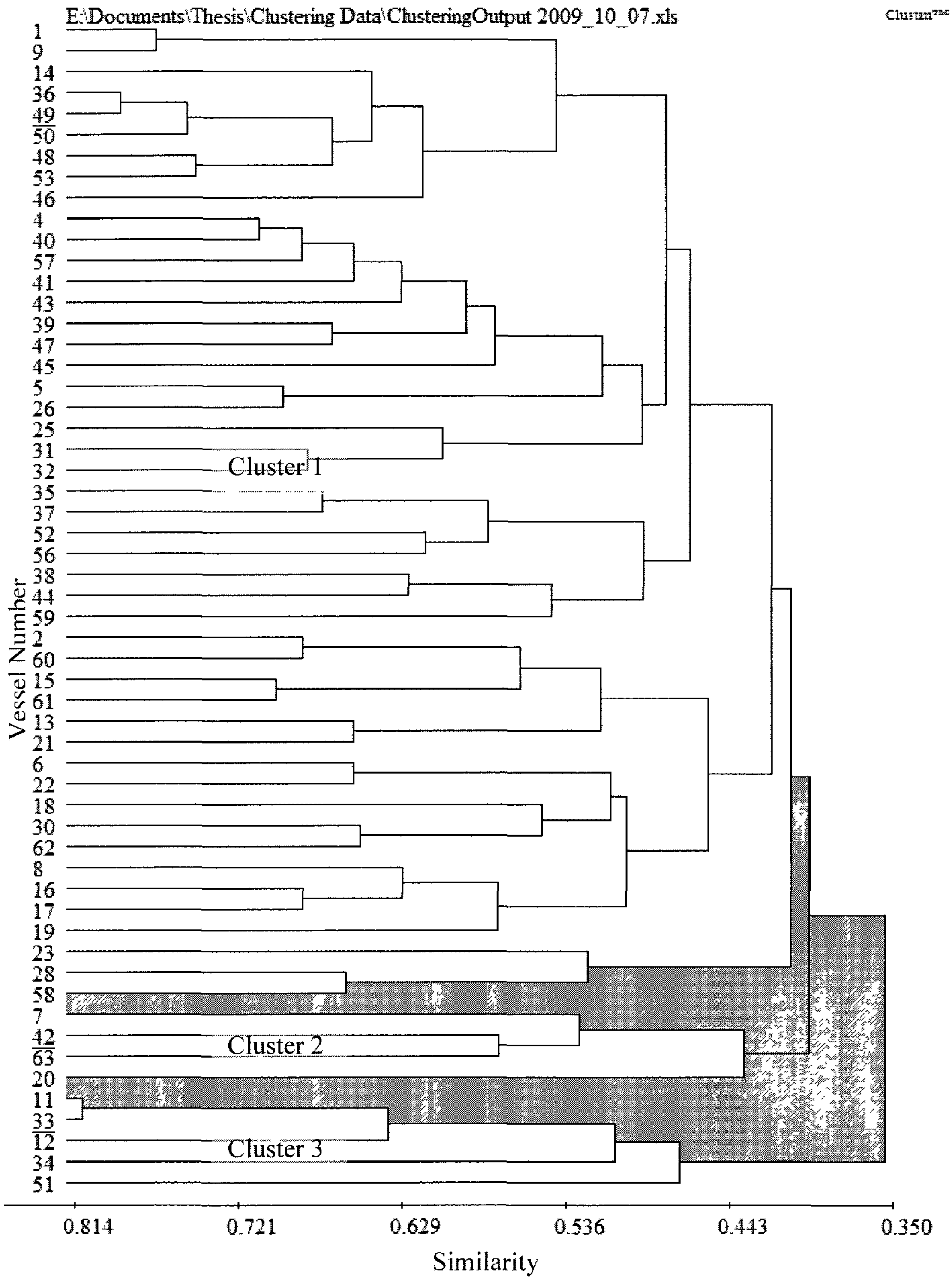


Figure 18. Dendrogram for P.P. vs. Saugeen Weighted Variables (Gower's Coefficient and UPGMA clustering).

vs. Saugeen) variables more heavily weighted, then clustered using the unweighted pair-group method using arithmetic average (UPGMA) clustering method. A three cluster solution is suggested via a 120 trial bootstrap validation without replacement and was adopted as shown. Cluster membership is presented in Table 48 by vessel number.

Cluster 1			Cluster 2	Cluster 3
1	23	45	7	11
2	25	46	20	12
4	26	47	42	33
5	28	48	63	34
6	30	49		51
8	31	50		
9	32	52		
13	35	53		
14	36	56		
15	37	57		
16	38	58		
17	39	59		
18	40	60		
19	41	61		
21	43	62		
22	44			

Table 48. P.P. vs. Saugeen (all variables) Cluster Membership (Exemplars in bold)

In this clustering exercise the traits that can be used to distinguish Point Peninsula from Saugeen pottery (interior surface modification, lip form, temper size, body thickness, and rim thickness, [Spence et al. 1990:158]) were assigned a weight of 2, while all other variables remained at a weight of 1. Although stylistic, shape, technological and size variable are all examined below, they are only briefly examined as this cluster weighting is found to be somewhat lacking and further refinement is undertaken.

A brief examination of the cluster membership shows that Cluster 3 is identical to equal weight Cluster 7. This cluster represents plain vessels with punctate delimiters. Cluster 2 represents primarily plain lipped vessels that are linear stamped in both the first band and interior. All other stylistic attributes are contained within Cluster 1, which incorporates 84 percent of the assemblage and generally follows the overall stylistic assemblage trends.

Cluster 1 mirrors the shape attribute frequencies seen for the entire assemblage. Rim walls tend towards convergence with convex interiors and variable exterior profiles. Most rims are outflaring. Incipient castellations are rare and lips are mostly straight or slightly convex. While significantly smaller, Cluster 2 exhibits the same distribution of shape attributes. Cluster 3 differs only in a trend towards straight interior and exterior rim profiles.

The similarity of Cluster 1 to the overall assemblage, in all technological aspects, is notable. Cluster 2 differs from Cluster 1, and the overall assemblage, with a preference for smoothed interiors, chunky consistency, and a surprisingly larger average temper size ($\bar{x}$=4.2 mm with a low standard deviation of 0.5 mm). Cluster 3 is notably different from the other clusters in that vessel exteriors tend to be wiped.

Cluster 1 vessels average the same size as the overall assemblage. Cluster 2 vessels are notable for their thicker bodies and rims while Cluster 3 is notable for thicker lips and similar body and rim thicknesses. Cluster 3 also has a larger average rim diameter.

In summary, clustering with the variables that distinguish Point Peninsula from Saugeen pottery weighted more heavily *and* all other variables shows some promise. For example there are notable differences in cluster attribute frequencies for some of the weighted variables (e.g., temper size). Conversely, a three cluster solution leaves a great deal of variability within Cluster 1, variability is eliminated with a greater number of clusters. Furthermore, in terms of drawing inferences about the clusters in relation to the archaeological pottery traditions and their differences, this clustering solution lacks significant differentiation in the distinguishing variables. This delineation is found in the clustering solution using *only* the Point Peninsula verses Saugeen variables, and thus this clustering with all variables is rejected for further analysis and discussion.

Point Peninsula vs. Saugeen (limited variables)

Cluster 1 (n=11). The vessels in Cluster 1 are almost equally delimited (55 percent [n=6]) and non-delimited (45 percent [n=45]). Decorative tool is predominately dentate (55 percent [n=6]), technique is stamped (55 percent [n=6]), and oblique right configurations are most common (45 percent [n=5]) in the first band. On lips, tool is typically dentate (55 percent [n=6]), configurations oblique right (36 percent [n=4]), and technique is stamped (55 percent [n=6]), and on the lip. The most common combination is for stamped dentate, which accounts for 46 percent (n=5) of this cluster. Second bands are similar, with the most common tool being dentate (45 percent [n=5]) and technique is commonly stamped (45 percent [n=5]), however horizontal configurations are more common in the second band (45 percent [n=5]). Interiors tend to be plain.

Cluster 1 vessels tend to have convex or straight lips (45 percent [n=5] each), converging walls (64 percent [n=7]), outflaring rims (73 percent [n=8]) with straight interior (64 percent [n=7]) and exterior profiles (73 percent [n=8]), and are uncastellated. The most notable shape quality of this cluster is that it is very similar to the assemblage as a whole, but for the straight rim profiles, which paired account for 45 percent (n=5) of the cluster. Furthermore, this cluster contains 30 percent (n=3) of the vertically oriented rims in the assemblage.

Technologically, attribute frequencies for Cluster 1 are similar to the assemblage at large (virtually no ochre wash, smoothed exteriors [73 percent (n=8)] for rims and bodies, few coil breaks [27 percent (n=3) present], variable consistency, Grit Type 1 temper [64 percent (n=7)], and a mean temper size of 2.84 mm) with two exceptions: interior surface modification is exclusively combed and large quantities of temper are used (64 percent [n=7] in large and extra-large categories combined).

Mean sizes for Cluster 1 are in similar proportions to the overall assemblage (increasing thickness from lip [$\bar{x}$=7.4] to rim [$\bar{x}$=8.0] to body [$\bar{x}$=8.8]; however they are all slightly larger, suggesting a cluster with larger vessels.

Cluster 2 (n=11). Non-delimited vessels are more common in Cluster 2 (64 percent [n=7]). Decoration in the first band tends to be dentate stamped (45 percent [n=5]), however there is more variation among tool, technique, and especially configuration than in Cluster 1. Second decorative bands tend to be plain or absent (combined 55 percent [n=6]), while interiors are also plain (73 percent [n=8]). Lips tend to be dentate tool decorated (36 percent [n=4]), technique is often stamped (73 percent [n=8]), and configuration in either oblique right or vertical (27 percent [n=3] each).

With a preference for convex lips (73 percent [n=8]) and the concentration of 30 percent (n=3) of the vertical rims in the analysis, lip and rim form frequencies in Cluster

2 are different than those for the entire assemblage. Otherwise, Cluster 2 form traits are similar to those of the entire assemblage: converging walls (64 percent [n=7]), outflaring rims (73 percent [n=8]), convex interior and exterior (45 percent [n=5]) or convex interior with concave exterior (27 percent [n=3]) rim profiles and no castellations.

Cluster 2 differs from the assemblage-wide trends in a preference for wiped interior surface modification (body 64 percent [n=7], rim 91 percent [n=10]) and equal frequencies of coil absence/presence. Cluster 2 tends to have larger quantities of temper (large category 45 percent [n=5]), and slightly smaller than average particle size ($\bar{x}$=2.58 mm).

Cluster 2 vessels have similar size trends as Cluster 1 and the overall assemblage. However, lip and rim average thicknesses ($\bar{x}$=6.6 and 7.5 mm respectively) are notably below assemblage average, as is rim diameter ($\bar{x}$=200.9 mm). However, average lip thickness in this cluster is fairly variable with a standard deviation (s) of 1.5 mm, and is influenced by the outlier vessel 28, with a lip thickness of 2.6 mm, the smallest in the assemblage. Conversely, rim and body thickness is less variable (s=1.1 mm and 1.2 mm respectively).

Cluster 3 (n=3). While small, Cluster 3 appears to represent non-delimited vessels with pseudo-scallop shell tool decoration over the exterior, interior and on the lip (each 67 percent [n=2]). Most areas are stamped (lip 100 percent [n=3], FB 67 percent [n=2], and SB 100 percent [n=3]) with the exception of the interior where drag-stamping is more popular (67 percent [n=2]). Configuration varies from vertical in the first band and on the lip (each 67 percent [n=2]), to variable in the second band (vertical, horizontal and horizontal difference each 33 percent [n=1]), to all oblique on the interior (right 67 percent [n=2], left 33 percent [n=1]).

All lips in Cluster 3 are straight. Rim walls tend to converge (67 percent [n=2]) and are on outflaring rims 100 percent [n=3] with straight interior and exterior profiles (each 67 percent [n=2]), with variable pairings. One vessel is castellated.

Cluster 3 includes one ochre washed vessel. Exteriors are all smoothed, and interior rims are all wiped, but interior bodies are equally combed, superimposed, and smoothed (33 percent [n=1] each). Markedly, Grit Type 1 is the only temper. Temper size is above average ($\bar{x}$=3.2 mm).

Average wall thicknesses for Cluster 3 are again increasing from lip to rim to body ($\bar{x}$=7.4 [s=.9] mm, 7.9[s=2.0] mm, 8.2[s=2.4] mm, respectively), however rim and body thickness is notable variable.

Cluster 4 (n=1). The single vessel in Cluster 4 is non-delimited, dentate tool decorated on the exterior, interior and lip. Technique and configuration varies between areas; in the first band it is vertical stamped, the second it is vertical drag-stamped, the interior is vertical drag-stamped, while the lip if oblique right stamped.

The vessel in Cluster 4 has a convex lip on an outflaring rim with converging walls. Exterior and interior rim profiles are straight and the vessel is not castellated nor is it ochre washed. Surface modification on the body interior is combed and on the exterior is wiped; rim interior and exterior is indeterminate. Coil breaks are absent and the consistency is chunky. Temper is Grit Type 1 in prolific quantities and is substantially larger than average, with a range clearly above the norm, 2.6 to 12.3 mm.

The vessel in Cluster 4 has the usual increasing thickness from lip to rim to body; however it is one of the largest cluster increases, 3.3 mm from lip to body. It is also thicker than all other averages in all areas, and has the largest rim diameter (220.0 mm).

Cluster 5 (n=8). Stylistically, Cluster 5 exhibits some variation. Most vessels are non-delimited (88 percent [n=7]). While the most common first exterior decorative band tool is dentate (38 percent [n=3]) with stamped technique (63 percent [n=5]) and oblique right configurations (50 percent [n=4]) being common. An absence of a first band is also notable (25 percent [n=2]). Likewise, second exterior decorative bands are most commonly dentate (38 percent [n=3]), but undecorated bands are present too (25 percent [n=2]). Second exterior decorative band technique is variable with a slight preference for rocker-stamped or stamped (25 percent [n=2] each). Interiors are mostly plain (63 percent [n=5]) and lips tend to be dentate stamped in an oblique right configuration (as a combination 38 percent [n=3]).

All vessels in Cluster 5 have convex lips. Rims are typically outflaring with converging walls (both 75 percent [n=6]). The trends in rim profiles are the same as the overall assemblage: convex (38 percent [n=3]) or concave (50 percent [n=4]) on the exterior and convex on the interior (63 percent [n=5]). Paired profiles tend to be convex on the interior with concave exteriors (50 percent [n=4]). All vessels are uncastellated.

Cluster 5 is again similar technologically to the overall assemblage, with the exception that interiors are predominately smoothed (63 percent [n=5] bodies and 100 percent [n=8] rims). Consistency tends to be either well-knit (38 percent [n=3]) or chunky to crumbly (25 percent [n=2] each). Temper is commonly Grit Type 1 (50 percent [n=4]), but 1/3 (n=2) of Type 6 tempered vessels are in this cluster too.

Cluster 5 has the standard increasing average thickness profile, but is overall thicker and increases drastically from lip to rim (+1.7 mm), and rim to body (+.9 mm). Rim diameter is also above average ($\bar{x}$=212.5 mm).

Cluster 6 (n=18). Delimitation in the form of punctates (17 percent [n=3]) and blank space (22 percent [n=4]) is present, however non-delimited is more common in Cluster 6. Decorative style for Cluster 6 is remarkably similar to that of the overall assemblage with preferences for dentate tool all areas (50 percent [n=9] everywhere but on the lip where it is 44 percent [n=8]). Technique is commonly stamped in the first exterior decorative band (83 percent [n=17]) and on the lip (89 percent [n=16]). Technique shifts in the second exterior decorative band and interior where, while dentate tool remains common, configurations are more commonly vertical (interior 39 percent [n=7] and second exterior decorative band 22 percent [n=4]) or oblique right (interior 28 percent [n=5], second exterior decorative band 39 percent [n=7]). One divergence from the assemblage frequencies is that this cluster contains mostly decorated interiors (66 percent [n=12]), while the overall assemblage tends to be plain.

Lip form for Cluster 6 is notable as it is predominately straight (89 percent [n=16]). Wall orientation is variable with a slight preference for diverging (33 percent [n=6]), and contains 80 percent (n=4) of the thickened lips in the assemblage. Rim orientation is outflaring (83 percent [n=15]) and exterior rim profiles tend to be convex (44 percent [n=8]) or concave (39 percent [n=7]) while interiors are convex (61 percent [n=11]). Rim profile pairs tend to be concave exteriors with convex interiors (33 percent [n=6]) or convex for both (22 percent [n=4]). One vessel is castellated.

Cluster 6 differs from the assemblage wide frequencies most notably when it comes to surface modification of the body interior, which is mixed between wiped (33 percent [n=6]), smoothed (28 percent [n=5]), and combed (22 percent [n=4]). Furthermore, all rim interiors have smoothed surfaces. Temper quantity tends to be medium (50 percent [n=9] and the type is variable, but mostly includes Grit Type 1 (72 percent [n=13]). Mean temper size is slightly smaller than average ($\bar{x}$=2.4 mm).

Cluster 6, like Cluster 3, shows only a .6 mm increases in average thickness from the lip ($\bar{x}$=7.0 [s=1.3] mm) to the rim ($\bar{x}$=7.3 [s=1.7] mm) to the body body ($\bar{x}$=7.6 [s=1.5] mm). All thickness are below average as is rim diameter ($\bar{x}$=198.3 mm), suggesting smaller than average sizes for this cluster.

Cluster 7 (n=4). Cluster 7 vessels are typically not delimited (75 percent [n=3]). Decoration tends to be with a linear tool in both the first exterior decorative band and second exterior decorative band (50 percent [n=2] each) with stamped technique being common in the first band (75 percent [n=3]) and stamped or incised in the second (50 percent [n=2] each). Configuration in the first band is either horizontal or oblique right (50 percent [n=2] each), while the second band more commonly exhibits horizontal difference (50 percent [n=2]). Interior technique tends to be drag-stamped (50 percent [n=2]) with either linear or crescent tools (25 percent [n=1]); or are they are plain (50 percent [n=2]). Lips are typically decorated in vertical configurations (75 percent [n=3]), linear tools are common (50 percent [n=2]), and technique is stamped (75 percent [n=3]).

Cluster 7 includes only vessels with complex (i.e., pointed) lips on converging walls. Rims tend to be outflaring (50 percent [n=2]), however vertical and everted forms are present (25 percent [n=1] each). Exterior profiles tend to be convex (75 percent [n=3]), interiors equally convex or concave (50 percent [n=2]), with pairing most commonly convex on the exterior and concave on the interior (50 percent [n=2]). All vessels are uncastellated.

Most technological variables occur in Cluster 7 in frequencies consistent with the entire assemblage, and are particularly similar to Cluster 3, with the exceptions that this cluster has all smoothed rim interiors (Cluster 3 has wiped) and Cluster 7 has the smallest average temper size ($\bar{x}$=2.2 mm).

Cluster 7 has the thinnest lips ($\bar{x}$=4.9 mm), and below average rim and body thickness means ($\bar{x}$=7.3, and 7.6 mm respectively). Thin lips are expected here given this cluster contains only complex (i.e., pointed) lip forms. The smallest average rim diameter appears in this cluster ($\bar{x}$=195.0 mm).

APPENDIX E: ASSOCIATIONS BETWEEN CLUSTER MEMBERSHIP AND ATTRIBUTES

	1st Variable	2nd Variable	1st Dep.	2nd Dep.
Stylistic	Delimiters	Cluster Membership	.458	.163
	FDB Tool	Cluster Membership	.584	.619
	FDB Technique	Cluster Membership	.427	.295
	FDB Configuration	Cluster Membership	.300	.347
	SDB Tool	Cluster Membership	.476	.530
	SDB Technique	Cluster Membership	.336	.311
	SDB Configuration	Cluster Membership	.283	.270
	Lip Tool	Cluster Membership	.536	.512
	Lip Technique	Cluster Membership	.532	.161
	Lip Configuration	Cluster Membership	.297	.240
	Interior Tool	Cluster Membership	.351	.324
	Interior Technique	Cluster Membership	.203	.111
	Interior Configuration	Cluster Membership	.217	.097
Shape	Combined rim profile	Cluster Membership	.156	.169
	Castellation	Cluster Membership	.057	.022
	Lip Form	Cluster Membership	.145	.087
	Wall Orientation	Cluster Membership	.183	.064
	Rim Orientation	Cluster Membership	.110	.038
Technological	Combined exterior surface	Cluster Membership	.289	.198
	Combined interior surface	Cluster Membership	.133	.210
	Coil Evidence	Cluster Membership	.024	.003
	Consistency	Cluster Membership	.233	.121
	Ochre Wash	Cluster Membership	.058	.017
	Temper Type	Cluster Membership	.277	.390
	Temper Quantity	Cluster Membership	.130	.058
	Average temper size (mm)	Cluster Membership	.493[a]	-
Size	Lip thickness (mm)	Cluster Membership	.623[a]	-
	Rim thickness (mm)	Cluster Membership	.372[a]	-
	Body thickness (mm)	Cluster Membership	.321[a]	-
	Rim diameter (mm)	Cluster Membership	.369[a]	-

Table 49. Values of Goodman and Kruskall's *Tau* and Eta^2 for Equally Weighted Variables Cluster Membership

Note: 'Combined' refers to the combinations listed in Appendix B
Dep. = Dependent
[a] Values calculated using $eta.^2$

APPENDIX F: POTTERY ASSEMBLAGE

Notes for Appendix F

Stylistic Attributes
CWS = Cord Wrapped Stick
PSS = Pseudo-Scallop Shell
FDB = First exterior decorative band
SDB = Second exterior decorative band

Technological Attributes
1 = Grit Temper 1
2 = Grit Temper 2
3 = Grit Temper 3
4 = Grit Temper 4
5 = Grit Temper 5
6 = Grit Temper 6
O=Organic
N/A = Not Available

Delimiters
FB = Exterior Bosses
FP = Exterior Punctates
SB = Blank Space

Ext. = Exterior
Int. = Interior

Vessel Number 1 Catalogue Number 13H32A514-1

Technological

Temper Type	Temper Quantity	Temper Size
1+2	Medium	X-Large

Consistency of Fabric	Coil breaks
Well-Knit	Present

Surface Modification

Rim Exterior	Rim Interior
smoothed	combed
Body Exterior	**Body Interior**
smoothed	combed

Shape

Lip Form
convex

Castellation
uncastellated

Rim Orientation
outflaring

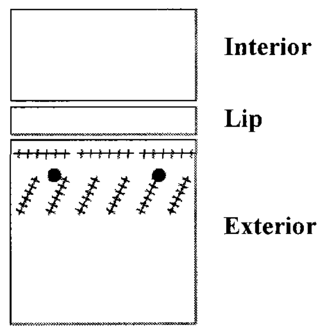
Exterior Rim Profile
straight

Interior and exterior wall relationship
parallel

Interior Rim Profile
straight

Metric Attributes (mm)

Lip Thickness	Body Thickness
8.5	7.8
Rim Thickness	**Rim Diameter**
5	200



Stylistic

Lip

Tool
plain

Technique
plain

Configuration
Plain

FDB

Tool
cws

Technique
stamped

Configuration
Horizontal

Interior

Tool
plain

Technique
plain

Configuration
Plain

SDB

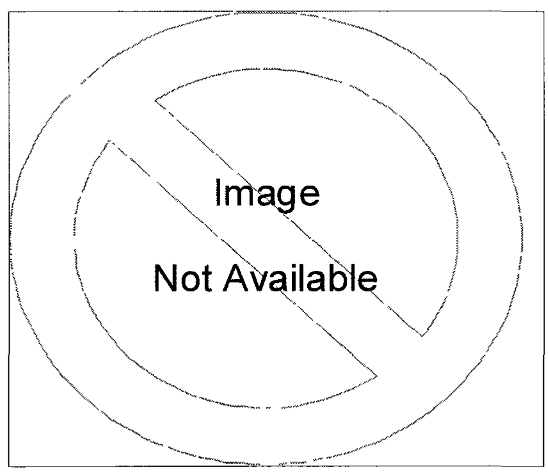
Tool
cws

Technique
stamped

Configuration
Oblique Right

Nature of Delimiters
FP

Ochre Wash
Absent



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Vessel Number 2 Catalogue Number 13H37H413-1

Technological

Temper Type	Temper Quantity	Temper Size
6	Medium	Large

Consistency of Fabric	Coil breaks
Well-Knit	Absent

Shape

Lip Form
convex

Castellation
uncastellated

Rim Orientation
outflaring

Exterior Rim Profile
concave

Interior and exterior wall relationship
converging

Interior Rim Profile
convex

Stylistic

Lip

Tool
pointed

Technique
stamped

Configuration
Punctates

FDB

Tool
No FDB

Technique
No FDB

Configuration
No FDB

Interior

Tool
plain

Technique
plain

Configuration
Plain

SDB

Tool
No SDB

Technique
No SDB

Configuration
No SDB

Nature of Delimiters
Absent

Ochre Wash
Absent

Surface Modification

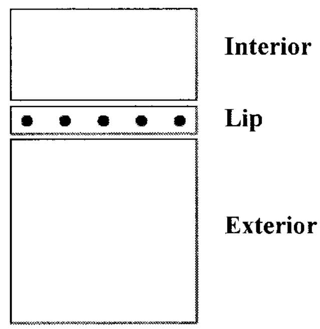
Rim Exterior	Rim Interior
indeterminate	smoothed

Body Exterior	Body Interior
textured	smoothed

Metric Attributes (mm)

Lip Thickness	Body Thickness
8.5	7.5

Rim Thickness	Rim Diameter
10.4	240



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Vessel Number 4 Catalogue Number 13H37D521-1

Technological

Temper Type	Temper Quantity	Temper Size
4+1	Medium	Medium

Consistency of Fabric	Coil breaks
Intermediate	Absent

Shape

Lip Form
straight

Castellation
uncastellated

Rim Orientation
outflaring

Exterior Rim Profile
concave

Interior and exterior wall relationship
thickened lip

Interior Rim Profile
convex

Stylistic

Lip

Tool
dentate

Technique
stamped

Configuration
Oblique Right

FDB

Tool
dentate

Technique
stamped

Configuration
Vertical

Interior

Tool
dentate

Technique
stamped

Configuration
Oblique Right

SDB

Tool
dentate

Technique
stamped

Configuration
Oblique Right

Nature of Delimiters
Absent

Ochre Wash
Absent

Surface Modification

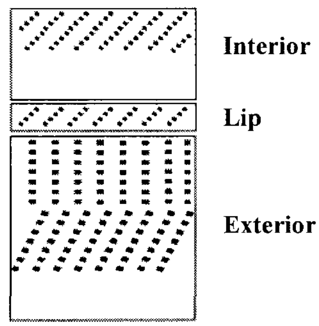
Rim Exterior	Rim Interior
smoothed	smoothed

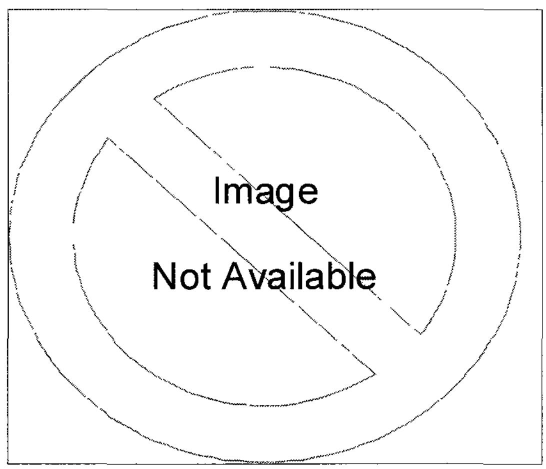
Body Exterior	Body Interior
smoothed	combed

Metric Attributes (mm)

Lip Thickness	Body Thickness
6	7

Rim Thickness	Rim Diameter
5.9	150





Image

Vessel Number 5 Catalogue Number 13H37D525-1

Technological

Temper Type	Temper Quantity	Temper Size
1	Medium	Medium

Consistency of Fabric	Coil breaks
Well-Knit	Absent

Surface Modification

Rim Exterior	Rim Interior
smoothed	smoothed

Body Exterior	Body Interior
smoothed	smoothed

Shape

Lip Form
straight

Castellation
uncastellated

Rim Orientation
vertical

Exterior Rim Profile
straight

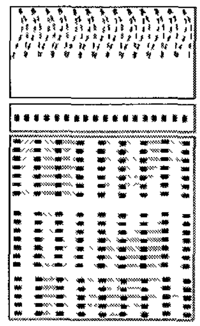
Interior and exterior wall relationship
converging

Interior Rim Profile
convex

Metric Attributes (mm)

Lip Thickness	Body Thickness
6	6.5

Rim Thickness	Rim Diameter
7.9	180



Interior

Lip

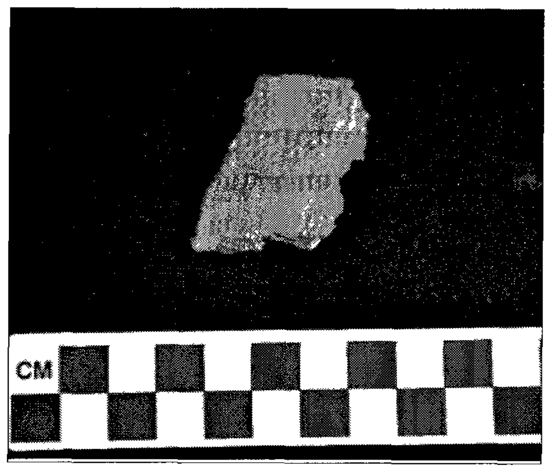
Exterior

Stylistic

Lip	FDB
Tool	**Tool**
dentate	dentate
Technique	**Technique**
stamped	drag-stamped
Configuration	**Configuration**
Horizontal	Vertical

Interior	SDB
Tool	**Tool**
dentate	dentate
Technique	**Technique**
rocker-stamped	drag-stamped
Configuration	**Configuration**
Vertical	Vertical

Nature of Delimiters	Ochre Wash
Absent	Absent



Image

Vessel Number 6 Catalogue Number 13H21E3-1

Technological

Temper Type	Temper Quantity	Temper Size
1	Small	X-Large

Consistency of Fabric	Coil breaks
Well-Knit	Absent

Surface Modification

Rim Exterior	Rim Interior
smoothed	smoothed

Body Exterior	Body Interior
smoothed	smoothed

Shape

Lip Form
convex

Castellation
uncastellated

Rim Orientation
outflaring

Exterior Rim Profile
convex

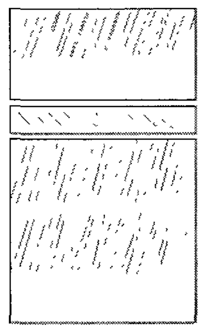
Interior and exterior wall relationship
converging

Interior Rim Profile
concave

Metric Attributes (mm)

Lip Thickness	Body Thickness
6.5	11.9

Rim Thickness	Rim Diameter
7.5	190



Interior

Lip

Exterior

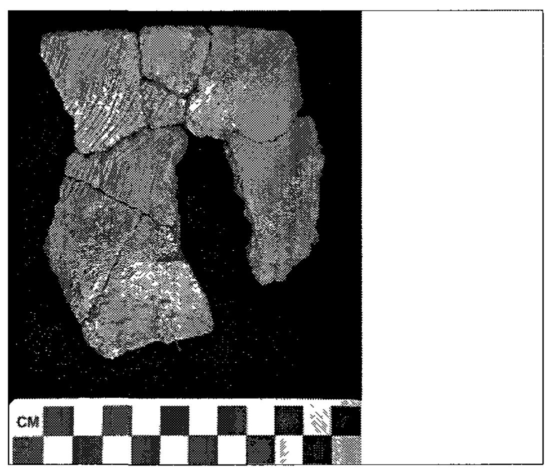
Stylistic

	Lip	FDB
Tool	linear	pointed
Technique	stamped	incised
Configuration	Oblique Left	Oblique Right

	Interior	SDB
Tool	pointed	pointed
Technique	incised	incised
Configuration	Oblique Right	Oblique Right

Nature of Delimiters
Absent

Ochre Wash
Absent



Image

Vessel Number 7 Catalogue Number 13H31H422

Technological

Temper Type	Temper Quantity	Temper Size
4+5	Large	X-Large

Consistency of Fabric
Intermediate

Coil breaks
Present

Surface Modification

Rim Exterior	Rim Interior
smoothed	smoothed

Body Exterior	Body Interior
smoothed	smoothed

Shape

Lip Form
complex

Castellation
uncastellated

Rim Orientation
everted lip

Exterior Rim Profile
concave

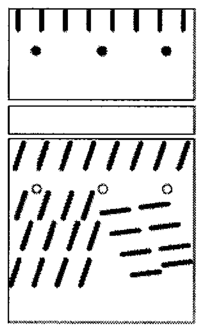
Interior and exterior wall relationship
converging

Interior Rim Profile
convex

Metric Attributes (mm)

Lip Thickness	Body Thickness
4	10

Rim Thickness	Rim Diameter
8.2	200



Interior

Lip

Exterior

Stylistic

Lip

Tool
plain

Technique
plain

Configuration
Plain

FDB

Tool
linear

Technique
stamped

Configuration
Oblique Right

Interior

Tool
linear

Technique
drag-stamped

Configuration
Vertical

SDB

Tool
linear

Technique
stamped

Configuration
Horizontal Differenc

Nature of Delimiters
FB

Ochre Wash
Absent

Image

Vessel Number 8 Catalogue Number 13H31T424

Technological

Temper Type	Temper Quantity	Temper Size
5	Large	Medium

Consistency of Fabric	Coil breaks
Well-Knit	Absent

Surface Modification

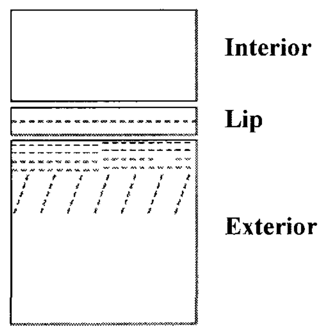
Rim Exterior	Rim Interior
smoothed	smoothed
Body Exterior	**Body Interior**
smoothed	smoothed

Shape

Lip Form	Castellation
straight	uncastellated
Rim Orientation	**Exterior Rim Profile**
outflaring	convex
Interior and exterior wall relationship	**Interior Rim Profile**
diverging	convex

Metric Attributes (mm)

Lip Thickness	Body Thickness
6	5
Rim Thickness	**Rim Diameter**
5.2	160

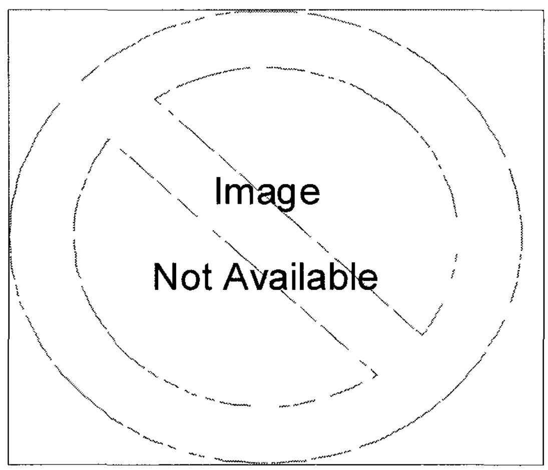


Stylistic

Lip	FDB
Tool	**Tool**
dentate	dentate
Technique	**Technique**
stamped	stamped
Configuration	**Configuration**
Horizontal	Horizontal

Interior	SDB
Tool	**Tool**
plain	dentate
Technique	**Technique**
plain	stamped
Configuration	**Configuration**
Plain	Oblique Right

Nature of Delimiters	Ochre Wash
SB	Absent



Image

Vessel Number 9 Catalogue Number 13H11B196-1

Technological

Temper Type
1

Temper Quantity
X-Large

Temper Size
X-Large

Consistency of Fabric
Well-Knit

Coil breaks
Absent

Surface Modification

Rim Exterior
smoothed

Rim Interior
combed

Body Exterior
smoothed

Body Interior
combed

Shape

Lip Form
convex

Castellation
uncastellated

Rim Orientation
outflaring

Exterior Rim Profile
straight

Interior and exterior wall relationship
diverging

Interior Rim Profile
straight

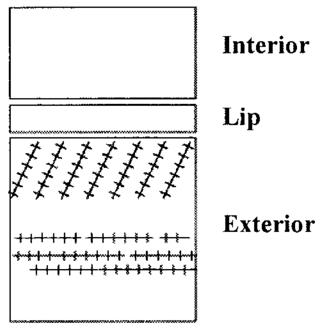
Metric Attributes (mm)

Lip Thickness
9.8

Body Thickness
10.2

Rim Thickness
10

Rim Diameter
200



Stylistic

Lip

Tool
plain

Technique
plain

Configuration
Plain

FDB

Tool
cws

Technique
stamped

Configuration
Oblique Right

Interior

Tool
plain

Technique
plain

Configuration
Plain

SDB

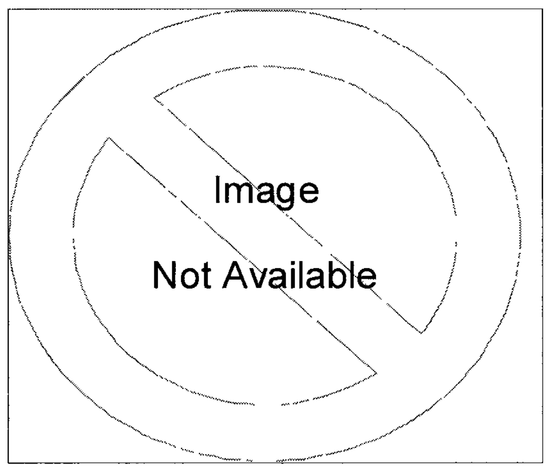
Tool
cws

Technique
stamped

Configuration
Horizontal

Nature of Delimiters
SB

Ochre Wash
Absent



Image

Vessel Number 11 Catalogue Number 13H21X6-1

Technological

Temper Type	Temper Quantity	Temper Size
4	Large	Small

Consistency of Fabric	Coil breaks
Well-Knit	Absent

Shape

Lip Form
convex

Castellation
uncastellated

Rim Orientation
outflaring

Exterior Rim Profile
convex

Interior and exterior wall relationship
diverging

Interior Rim Profile
convex

Stylistic

	Lip	FDB
Tool	cws	plain
Technique	stamped	plain
Configuration	Oblique Right	Plain

	Interior	SDB
Tool	plain	plain
Technique	plain	plain
Configuration	Plain	Plain

Nature of Delimiters	Ochre Wash
FP	Absent

Surface Modification

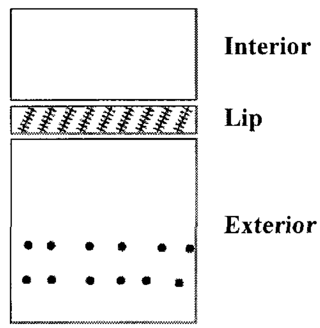
Rim Exterior	Rim Interior
wiped	wiped

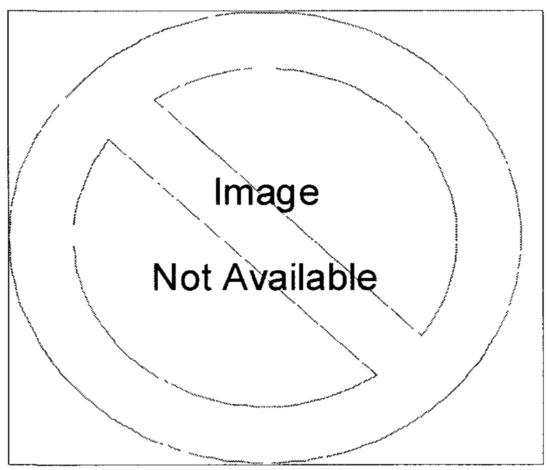
Body Exterior	Body Interior
wiped	wiped

Metric Attributes (mm)

Lip Thickness	Body Thickness
8	6.8

Rim Thickness	Rim Diameter
7.6	240





Image

Vessel Number 12 Catalogue Number 13H32K561-1

Technological

Temper Type	Temper Quantity	Temper Size
1+6	Large	Medium

Consistency of Fabric	Coil breaks
Well-Knit	Absent

Surface Modification

Rim Exterior	Rim Interior
smoothed	smoothed
Body Exterior	**Body Interior**
wiped	smoothed

Shape

Lip Form
straight

Castellation
uncastellated

Rim Orientation
outflaring

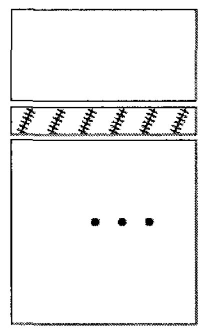
Exterior Rim Profile
straight

Interior and exterior wall relationship
diverging

Interior Rim Profile
straight

Metric Attributes (mm)

Lip Thickness	Body Thickness
9	7.5
Rim Thickness	**Rim Diameter**
9.4	220

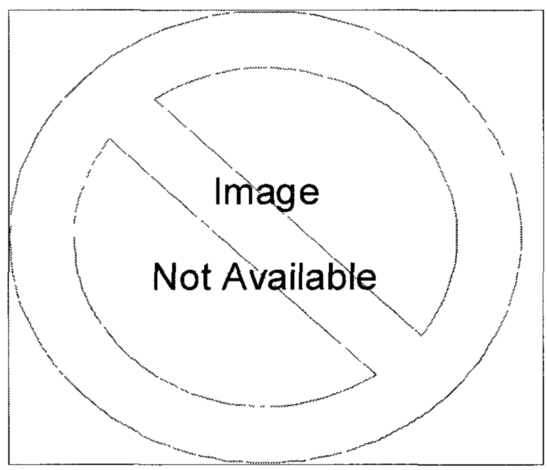


Stylistic

Lip		FDB	
Tool	cws	**Tool**	plain
Technique	stamped	**Technique**	plain
Configuration	Oblique Right	**Configuration**	Plain

Interior		SDB	
Tool	plain	**Tool**	plain
Technique	plain	**Technique**	plain
Configuration	Plain	**Configuration**	Plain

Nature of Delimiters	Ochre Wash
FP	Absent



Image

Vessel Number 13 Catalogue Number 13H13J3

Technological

Temper Type	Temper Quantity	Temper Size
3	Large	X-Large

Consistency of Fabric	Coil breaks
Laminated	Present

Surface Modification

Rim Exterior	Rim Interior
smoothed	wiped

Body Exterior	Body Interior
smoothed	wiped

Shape

Lip Form	Castellation
convex	uncastellated

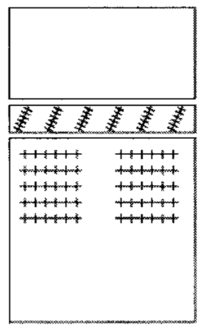
Rim Orientation	Exterior Rim Profile
vertical	straight

Interior and exterior wall relationship	Interior Rim Profile
diverging	straight

Metric Attributes (mm)

Lip Thickness	Body Thickness
8.4	8

Rim Thickness	Rim Diameter
6.5	200



Stylistic

Lip

Tool	Technique	Configuration
cws	stamped	Oblique Right

FDB

Tool	Technique	Configuration
cws	stamped	Plaits

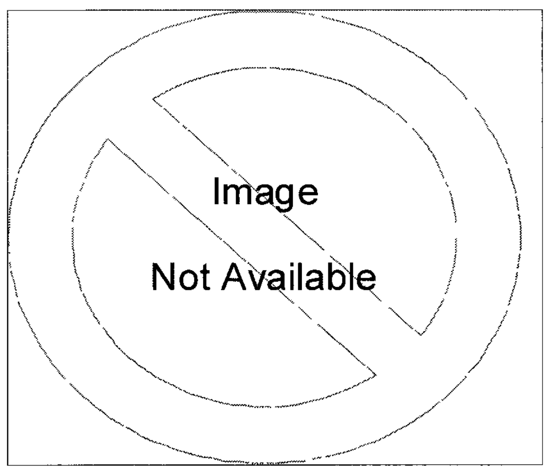
Interior

Tool	Technique	Configuration
plain	plain	Plain

SDB

Tool	Technique	Configuration
No SDB	No SDB	No SDB

Nature of Delimiters	Ochre Wash
Absent	Absent



Image

Vessel Number 14 Catalogue Number 13H29C41-1

Technological

Temper Type	Temper Quantity	Temper Size
1	Medium	X-Large

Consistency of Fabric	Coil breaks
Intermediate	Absent

Surface Modification

Rim Exterior	Rim Interior
smoothed	combed

Body Exterior	Body Interior
smoothed	wiped

Shape

Lip Form
convex

Castellation
uncastellated

Rim Orientation
outflaring

Exterior Rim Profile
concave

Interior and exterior wall relationship
converging

Interior Rim Profile
convex

Metric Attributes (mm)

Lip Thickness	Body Thickness
6.5	7.4

Rim Thickness	Rim Diameter
9	190

Vessel Not Available for Sketch

Interior

Lip

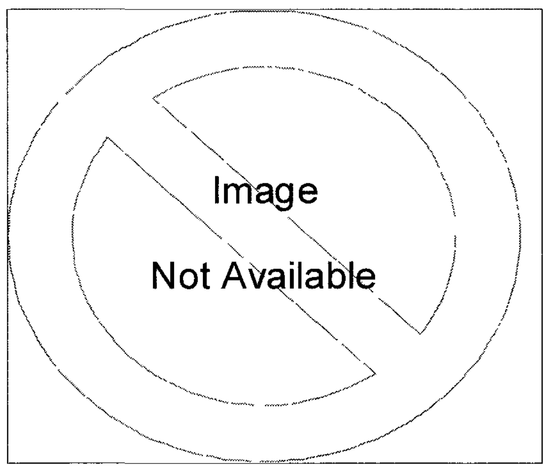
Exterior

Stylistic

	Lip	FDB
Tool	dentate	dentate
Technique	stamped	stamped
Configuration	Horizontal	Vertical

	Interior	SDB
Tool	plain	cws
Technique	plain	stamped
Configuration	Plain	Horizontal

Nature of Delimiters	Ochre Wash
Absent	Absent



Image

Vessel Number 15 Catalogue Number 13H30H411-1

Technological

Temper Type	Temper Quantity	Temper Size
6	Large	Medium

Consistency of Fabric	Coil breaks
Intermediate	Absent

Surface Modification

Rim Exterior	Rim Interior
textured	smoothed

Body Exterior	Body Interior
superimposed	wiped

Shape

Lip Form
straight

Castellation
uncastellated

Rim Orientation
outflaring

Exterior Rim Profile
concave

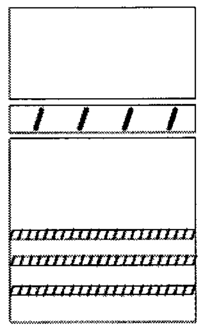
Interior and exterior wall relationship
converging

Interior Rim Profile
convex

Metric Attributes (mm)

Lip Thickness	Body Thickness
8	7.1

Rim Thickness	Rim Diameter
5.9	220



Stylistic

Lip

Tool
linear

Technique
stamped

Configuration
Oblique Right

FDB

Tool
cord

Technique
stamped

Configuration
Horizontal

Interior

Tool
plain

Technique
plain

Configuration
Plain

SDB

Tool
No SDB

Technique
No SDB

Configuration
No SDB

Nature of Delimiters
Absent

Ochre Wash
Absent

Image

Vessel Number 16 Catalogue Number 13H41X614-2

Technological

Temper Type	Temper Quantity	Temper Size
6	Small	Large

Consistency of Fabric	Coil breaks
Well-Knit	Absent

Shape

Lip Form
convex

Castellation
uncastellated

Rim Orientation
outflaring

Exterior Rim Profile
convex

Interior and exterior wall relationship
parallel

Interior Rim Profile
convex

Stylistic

Lip

Tool
cws

Technique
stamped

Configuration
Oblique Left

FDB

Tool
cws

Technique
stamped

Configuration
Horizontal

Interior

Tool
plain

Technique
plain

Configuration
Plain

SDB

Tool
cws

Technique
stamped

Configuration
Oblique Right

Nature of Delimiters
FP

Ochre Wash
Absent

Surface Modification

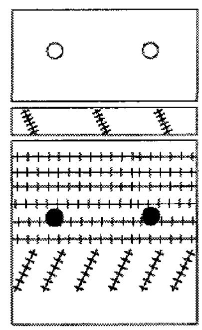
Rim Exterior	Rim Interior
smoothed	smoothed

Body Exterior	Body Interior
smoothed	smoothed

Metric Attributes (mm)

Lip Thickness	Body Thickness
8	8.9

Rim Thickness	Rim Diameter
8.4	270



Interior

Lip

Exterior

Image

Vessel Number 17 Catalogue Number 13H41X614-1

Technological

Temper Type	Temper Quantity	Temper Size
6	X-Large	Medium

Consistency of Fabric	Coil breaks
Well-Knit	Absent

Shape

Lip Form
straight

Castellation
uncastellated

Rim Orientation
outflaring

Exterior Rim Profile
concave

Interior and exterior wall relationship
thickened lip

Interior Rim Profile
convex

Stylistic

Lip

Tool
cws

Technique
stamped

Configuration
Oblique Right

FDB

Tool
cws

Technique
stamped

Configuration
Horizontal

Interior

Tool
plain

Technique
plain

Configuration
Plain

SDB

Tool
No SDB

Technique
No SDB

Configuration
No SDB

Nature of Delimiters
FP

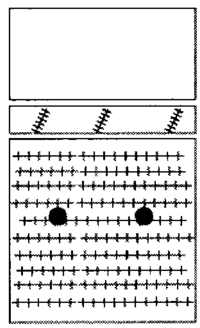
Ochre Wash
Absent

Surface Modification

Rim Exterior	Rim Interior
smoothed	smoothed
Body Exterior	**Body Interior**
smoothed	smoothed

Metric Attributes (mm)

Lip Thickness	Body Thickness
8.4	8.6
Rim Thickness	**Rim Diameter**
5	220



Interior

Lip

Exterior

Image

Vessel Number 18 Catalogue Number 13H31S411

Technological

Temper Type
1

Temper Quantity
Large

Temper Size
Medium

Consistency of Fabric
Well-Knit

Coil breaks
Absent

Shape

Lip Form
complex

Castellation
uncastellated

Rim Orientation
vertical

Exterior Rim Profile
convex

Interior and exterior wall relationship
converging

Interior Rim Profile
concave

Stylistic

Lip

Tool
cws

Technique
stamped

Configuration
Vertical

FDB

Tool
cws

Technique
stamped

Configuration
Oblique Right

Interior

Tool
crescent

Technique
drag-stamped

Configuration
Vertical

SDB

Tool
cws

Technique
stamped

Configuration
Horizontal

Nature of Delimiters
Absent

Ochre Wash
Absent

Surface Modification

Rim Exterior
smoothed

Rim Interior
smoothed

Body Exterior
smoothed

Body Interior
wiped

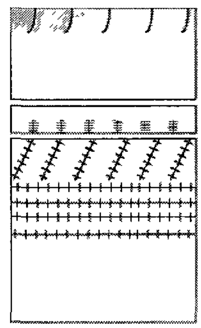
Metric Attributes (mm)

Lip Thickness
4

Body Thickness
5.7

Rim Thickness
5.7

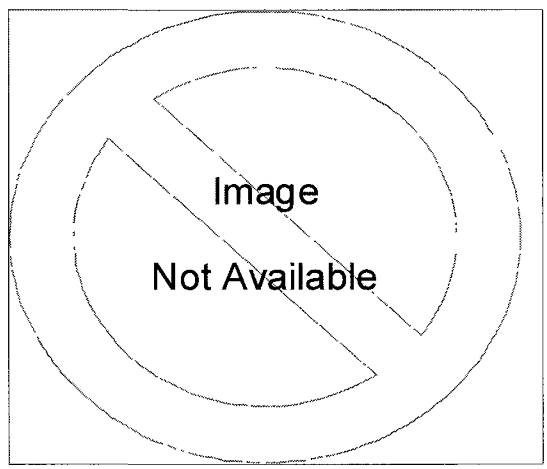
Rim Diameter
210



Interior

Lip

Exterior



Image

Vessel Number 19 Catalogue Number 13H41G434

Technological

Temper Type	Temper Quantity	Temper Size
6	Medium	Large

Consistency of Fabric	Coil breaks
Well-Knit	Absent

Shape

Lip Form	Castellation
convex	uncastellated
Rim Orientation	**Exterior Rim Profile**
outflaring	convex
Interior and exterior wall relationship	**Interior Rim Profile**
thickened lip	concave

Stylistic

Lip	FDB
Tool	**Tool**
cws	cws
Technique	**Technique**
stamped	stamped
Configuration	**Configuration**
Oblique Right	Horizontal

Interior	SDB
Tool	**Tool**
cws	cws
Technique	**Technique**
stamped	stamped
Configuration	**Configuration**
Oblique Right	Zig-Zag

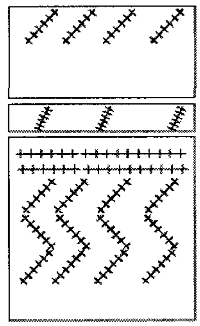
Nature of Delimiters	Ochre Wash
SB	Absent

Surface Modification

Rim Exterior	Rim Interior
smoothed	smoothed
Body Exterior	**Body Interior**
smoothed	wiped

Metric Attributes (mm)

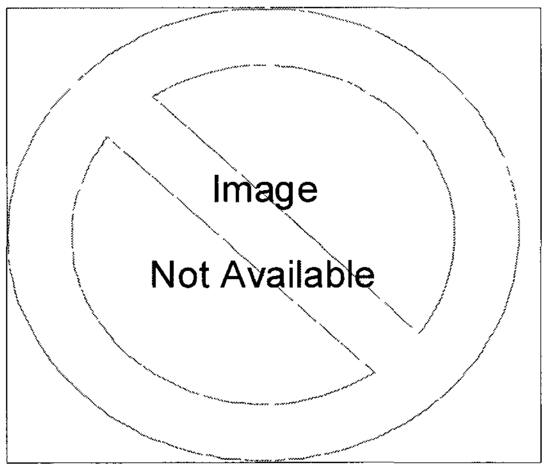
Lip Thickness	Body Thickness
7.8	8.6
Rim Thickness	**Rim Diameter**
6.1	180



Interior

Lip

Exterior



Image

Vessel Number 20 Catalogue Number 13H41V514-1

Technological

Temper Type	Temper Quantity	Temper Size
4+1+5	X-Large	X-Large

Consistency of Fabric	Coil breaks
Crumbly	Absent

Shape

Lip Form
straight

Castellation
uncastellated

Rim Orientation
outflaring

Exterior Rim Profile
convex

Interior and exterior wall relationship
diverging

Interior Rim Profile
convex

Stylistic

Lip

Tool
cws

Technique
stamped

Configuration
Oblique Right

FDB

Tool
cws

Technique
stamped

Configuration
Oblique Left

Interior

Tool
linear

Technique
stamped

Configuration
Vertical

SDB

Tool
cws

Technique
stamped

Configuration
Vertical

Nature of Delimiters
FP

Ochre Wash
Absent

Surface Modification

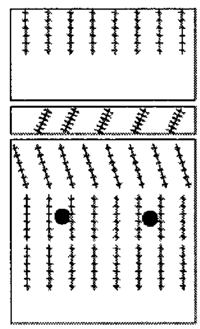
Rim Exterior	Rim Interior
smoothed	smoothed

Body Exterior	Body Interior
smoothed	wiped

Metric Attributes (mm)

Lip Thickness	Body Thickness
10	11.5

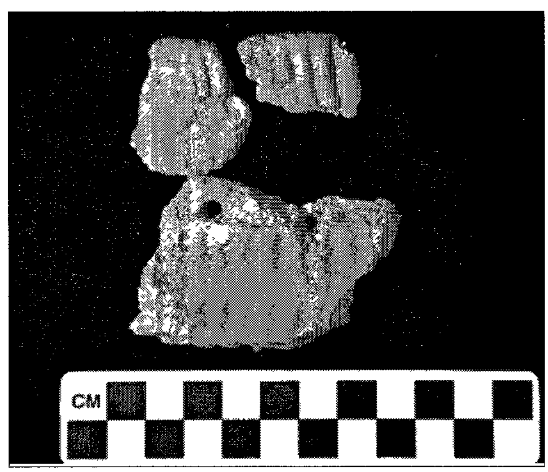
Rim Thickness	Rim Diameter
11.2	250



Interior

Lip

Exterior



Image

Vessel Number 21 Catalogue Number 13H32M314-2

Technological

Temper Type	Temper Quantity	Temper Size
6	Small	Large

Consistency of Fabric	Coil breaks
Well-Knit	Absent

Surface Modification

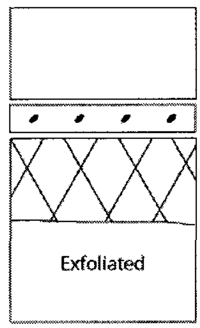
Rim Exterior	Rim Interior
smoothed	wiped
Body Exterior	**Body Interior**
smoothed	wiped

Shape

Lip Form	Castellation
convex	uncastellated
Rim Orientation	**Exterior Rim Profile**
vertical	convex
Interior and exterior wall relationship	**Interior Rim Profile**
converging	concave

Metric Attributes (mm)

Lip Thickness	Body Thickness
7.3	8.6
Rim Thickness	**Rim Diameter**
8.3	210



Interior

Lip

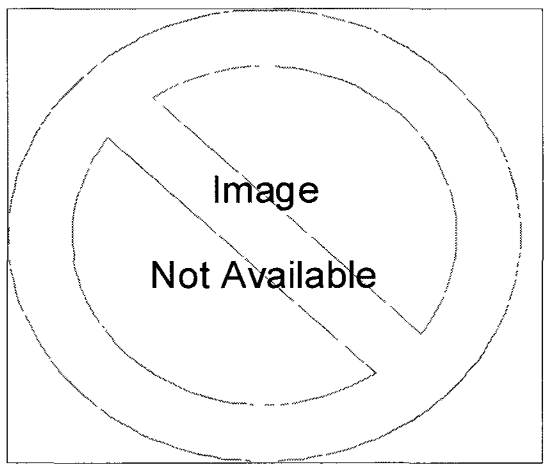
Exterior

Stylistic

Lip	FDB
Tool	**Tool**
pointed	pointed
Technique	**Technique**
stamped	incised
Configuration	**Configuration**
Punctates	Diamonds

Interior	SDB
Tool	**Tool**
plain	No SDB
Technique	**Technique**
plain	No SDB
Configuration	**Configuration**
Plain	No SDB

Nature of Delimiters	Ochre Wash
Absent	Absent



Image

Vessel Number 22 Catalogue Number 13H41H312-1

Technological

Temper Type	Temper Quantity	Temper Size
4+6	Small	Small

Consistency of Fabric	Coil breaks
Well-Knit	Absent

Surface Modification

Rim Exterior	Rim Interior
smoothed	smoothed
Body Exterior	**Body Interior**
smoothed	smoothed

Shape

Lip Form
complex

Castellation
uncastellated

Rim Orientation
outflaring

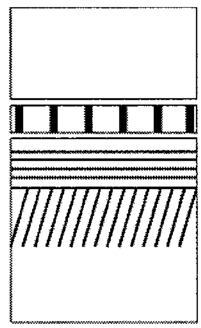
Exterior Rim Profile
convex

Interior and exterior wall relationship
converging

Interior Rim Profile
convex

Metric Attributes (mm)

Lip Thickness	Body Thickness
6.7	8.2
Rim Thickness	**Rim Diameter**
9.2	170



Stylistic

Lip	FDB
Tool	**Tool**
linear	linear
Technique	**Technique**
stamped	incised
Configuration	**Configuration**
Vertical	Horizontal

Interior	SDB
Tool	**Tool**
plain	pointed
Technique	**Technique**
plain	incised
Configuration	**Configuration**
Plain	Oblique Right

Nature of Delimiters	Ochre Wash
Absent	Absent

Image

Vessel Number 23 Catalogue Number 13H31N411

Technological

Temper Type	Temper Quantity	Temper Size
4+1+3	Medium	Medium

Consistency of Fabric	Coil breaks
Intermediate	Present

Shape

Lip Form
convex

Castellation
uncastellated

Rim Orientation
outflaring

Exterior Rim Profile
convex

Interior and exterior wall relationship
parallel

Interior Rim Profile
convex

Stylistic

Lip

Tool
pss

Technique
stamped

Configuration
Vertical

FDB

Tool
pss

Technique
rocker-stamped

Configuration
Vertical

Interior

Tool
plain

Technique
plain

Configuration
Plain

SDB

Tool
pss

Technique
rocker-stamped

Configuration
Vertical

Nature of Delimiters
SB

Ochre Wash
Absent

Surface Modification

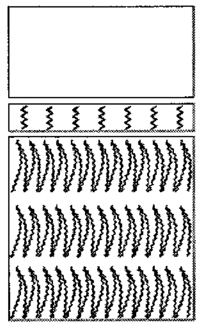
Rim Exterior	Rim Interior
smoothed	wiped

Body Exterior	Body Interior
smoothed	combed

Metric Attributes (mm)

Lip Thickness	Body Thickness
6.1	10.8

Rim Thickness	Rim Diameter
7.6	260



Interior

Lip

Exterior

Image

Vessel Number 24 Catalogue Number 13H30X420-2

Technological

Temper Type	Temper Quantity	Temper Size

Consistency of Fabric	Coil breaks
Well-Knit	

Surface Modification

Rim Exterior	Rim Interior
smoothed	smoothed
Body Exterior	**Body Interior**
wiped	combed

Shape

Lip Form	Castellation
straight	uncastellated
Rim Orientation	**Exterior Rim Profile**
outflaring	convex
Interior and exterior wall relationship	**Interior Rim Profile**
converging	concave

Metric Attributes (mm)

Lip Thickness	Body Thickness
0	0
Rim Thickness	**Rim Diameter**
0	0

Vessel Not Available for Sketch

Interior

Lip

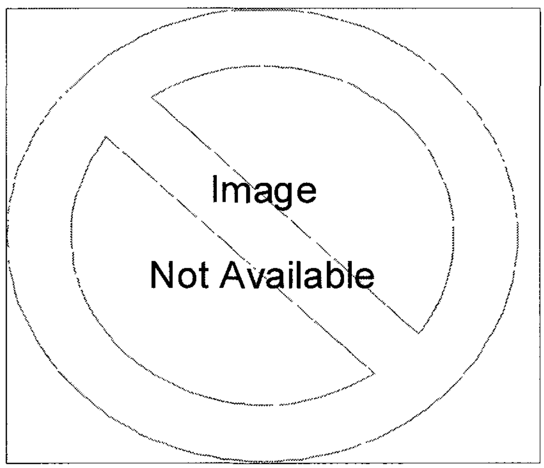
Exterior

Stylistic

Lip	FDB
Tool	**Tool**
pss	pss
Technique	**Technique**
stamped	stamped
Configuration	**Configuration**
Vertical	Horizontal Differenc

Interior	SDB
Tool	**Tool**
plain	pss
Technique	**Technique**
plain	stamped
Configuration	**Configuration**
Plain	Horizontal Differenc

Nature of Delimiters	Ochre Wash
Absent	Absent



Image

Vessel Number 25 Catalogue Number 13H30K421-1

Technological

Temper Type	Temper Quantity	Temper Size
1	Large	Large

Consistency of Fabric	Coil breaks
Intermediate	Absent

Surface Modification

Rim Exterior	Rim Interior
smoothed	wiped
Body Exterior	**Body Interior**
smoothed	superimposed

Shape

Lip Form
straight

Castellation
uncastellated

Rim Orientation
outflaring

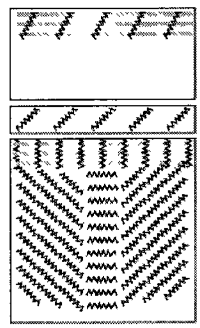
Exterior Rim Profile
straight

Interior and exterior wall relationship
converging

Interior Rim Profile
convex

Metric Attributes (mm)

Lip Thickness	Body Thickness
6.4	6.6
Rim Thickness	**Rim Diameter**
7.5	200



Interior

Lip

Exterior

Stylistic

Lip

Tool
pss

Technique
stamped

Configuration
Oblique Right

FDB

Tool
pss

Technique
drag-stamped

Configuration
Vertical

Interior

Tool
pss

Technique
drag-stamped

Configuration
Oblique Right

SDB

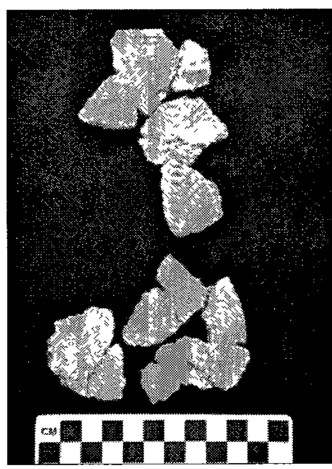
Tool
pss

Technique
stamped

Configuration
Horizontal Differenc

Nature of Delimiters
Absent

Ochre Wash
Present



Image

Vessel Number 26 Catalogue Number 13H42B312-1

Technological

Temper Type	Temper Quantity	Temper Size
1	Medium	Large

Consistency of Fabric	Coil breaks
Well-Knit	Absent

Shape

Lip Form	Castellation
straight	uncastellated
Rim Orientation	**Exterior Rim Profile**
vertical	straight
Interior and exterior wall relationship	**Interior Rim Profile**
parallel	straight

Stylistic

Lip	FDB
Tool	**Tool**
pss	pss
Technique	**Technique**
stamped	stamped
Configuration	**Configuration**
Oblique Left	Vertical

Interior	SDB
Tool	**Tool**
pss	pss
Technique	**Technique**
rocker-stamped	stamped
Configuration	**Configuration**
Vertical	Horizontal

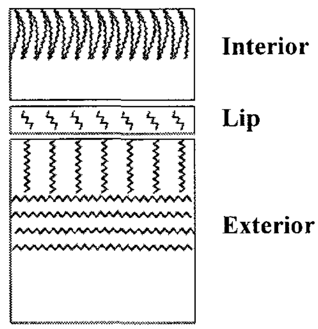
Nature of Delimiters	Ochre Wash
Absent	Absent

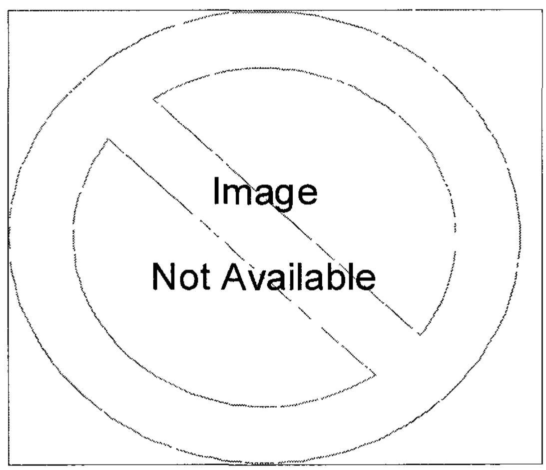
Surface Modification

Rim Exterior	Rim Interior
smoothed	smoothed
Body Exterior	**Body Interior**
smoothed	smoothed

Metric Attributes (mm)

Lip Thickness	Body Thickness
5.3	6.2
Rim Thickness	**Rim Diameter**
6.3	180





Image

Vessel Number 28 Catalogue Number 13H11B271-1

Technological

Temper Type	Temper Quantity	Temper Size
5+pottery	Small	X-Large

Consistency of Fabric	Coil breaks
Intermediate	Present

Shape

Lip Form	Castellation
complex	uncastellated
Rim Orientation	**Exterior Rim Profile**
vertical	convex
Interior and exterior wall relationship	**Interior Rim Profile**
converging	convex

Stylistic

Lip	FDB
Tool	**Tool**
plain	pss
Technique	**Technique**
plain	drag-stamped
Configuration	**Configuration**
Plain	Oblique Right

Interior	SDB
Tool	**Tool**
plain	dentate
Technique	**Technique**
plain	push-pull
Configuration	**Configuration**
Plain	Horizontal

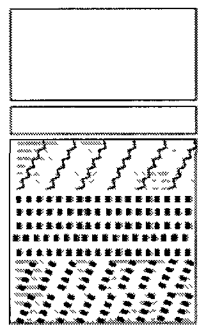
Nature of Delimiters	Ochre Wash
Absent	Absent

Surface Modification

Rim Exterior	Rim Interior
smoothed	wiped
Body Exterior	**Body Interior**
smoothed	wiped

Metric Attributes (mm)

Lip Thickness	Body Thickness
2.6	9
Rim Thickness	**Rim Diameter**
7.5	180



Interior

Lip

Exterior

Image

Vessel Number 30 Catalogue Number 13H38F425-1

Technological

Temper Type	Temper Quantity	Temper Size
1	Medium	Medium

Consistency of Fabric	Coil breaks
Intermediate	Present

Surface Modification

Rim Exterior	Rim Interior
smoothed	smoothed

Body Exterior	Body Interior
smoothed	indeterminate

Shape

Lip Form	Castellation
straight	uncastellated

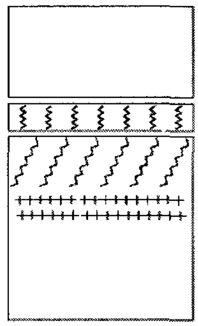
Rim Orientation	Exterior Rim Profile
outflaring	convex

Interior and exterior wall relationship	Interior Rim Profile
parallel	concave

Metric Attributes (mm)

Lip Thickness	Body Thickness
6.7	7

Rim Thickness	Rim Diameter
6.2	160



Interior

Lip

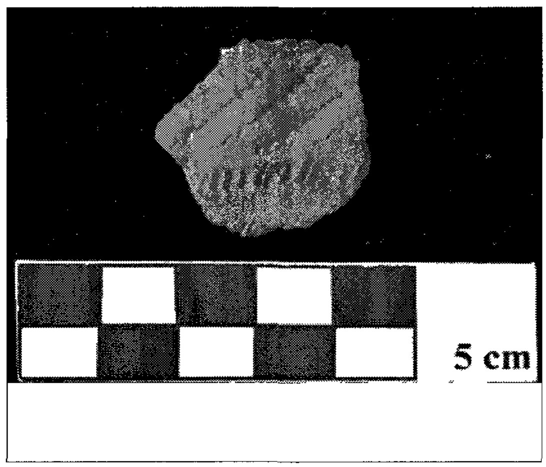
Exterior

Stylistic

Lip	FDB
Tool	**Tool**
pss	pss
Technique	**Technique**
stamped	stamped
Configuration	**Configuration**
Vertical	Oblique Right

Interior	SDB
Tool	**Tool**
plain	cws
Technique	**Technique**
plain	stamped
Configuration	**Configuration**
Plain	Oblique Right

Nature of Delimiters	Ochre Wash
Absent	Absent



Image

Vessel Number 31 Catalogue Number 13H41M424-1

Technological

Temper Type	**Temper Quantity**	**Temper Size**
1	Medium	Large

Consistency of Fabric	**Coil breaks**
Intermediate	Absent

Shape

Lip Form straight	**Castellation** uncastellated
Rim Orientation outflaring	**Exterior Rim Profile** straight
Interior and exterior wall relationship converging	**Interior Rim Profile** straight

Stylistic

Lip	**FDB**
Tool	**Tool**
pss	pss
Technique	**Technique**
stamped	stamped
Configuration	**Configuration**
Vertical	Oblique Right

Interior	**SDB**
Tool	**Tool**
plain	pss
Technique	**Technique**
plain	stamped
Configuration	**Configuration**
Plain	Horizontal

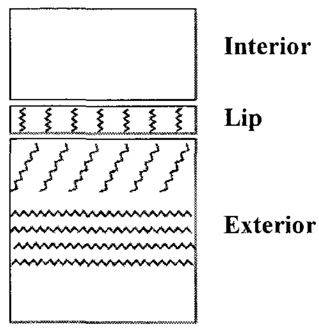
Nature of Delimiters	**Ochre Wash**
SB	Absent

Surface Modification

Rim Exterior	**Rim Interior**
smoothed	combed
Body Exterior	**Body Interior**
smoothed	combed

Metric Attributes (mm)

Lip Thickness	**Body Thickness**
6.4	8.9
Rim Thickness	**Rim Diameter**
8.8	210



Image

Vessel Number 32 Catalogue Number 13H41Y612

Technological

Temper Type	Temper Quantity	Temper Size
1	Medium	X-Large

Consistency of Fabric	Coil breaks
Chunky	Present

Surface Modification

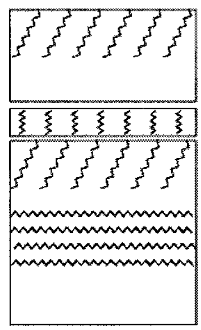
Rim Exterior	Rim Interior
smoothed	wiped
Body Exterior	**Body Interior**
smoothed	smoothed

Shape

Lip Form	**Castellation**
straight	uncastellated
Rim Orientation	**Exterior Rim Profile**
outflaring	convex
Interior and exterior wall relationship	**Interior Rim Profile**
converging	straight

Metric Attributes (mm)

Lip Thickness	Body Thickness
7.7	11
Rim Thickness	**Rim Diameter**
10	210



Interior

Lip

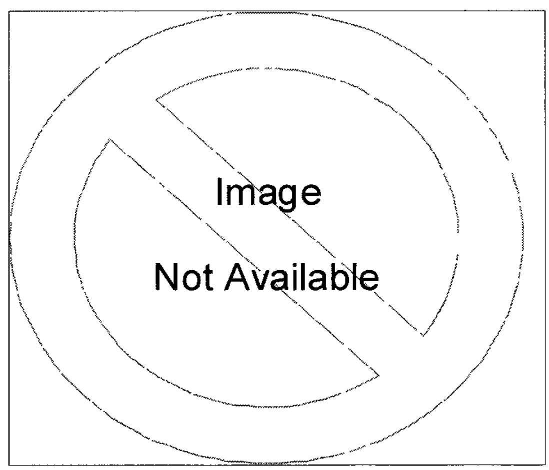
Exterior

Stylistic

Lip	FDB
Tool	**Tool**
pss	pss
Technique	**Technique**
stamped	stamped
Configuration	**Configuration**
Vertical	Oblique Right

Interior	SDB
Tool	**Tool**
pss	pss
Technique	**Technique**
stamped	stamped
Configuration	**Configuration**
Oblique Right	Horizontal

Nature of Delimiters	Ochre Wash
Absent	Absent



Image

Vessel Number 33 Catalogue Number 13H21N5

Technological

Temper Type	Temper Quantity	Temper Size
1+6	Large	Medium

Consistency of Fabric	Coil breaks
Laminated	Present

Surface Modification

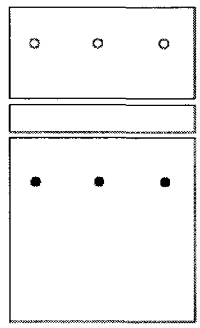
Rim Exterior	Rim Interior
wiped	wiped
Body Exterior	**Body Interior**
wiped	wiped

Shape

Lip Form	Castellation
convex	uncastellated
Rim Orientation	**Exterior Rim Profile**
outflaring	convex
Interior and exterior wall relationship	**Interior Rim Profile**
converging	convex

Metric Attributes (mm)

Lip Thickness	Body Thickness
7	8
Rim Thickness	**Rim Diameter**
7.7	200



Interior

Lip

Exterior

Stylistic

Lip	FDB
Tool	**Tool**
plain	plain
Technique	**Technique**
plain	plain
Configuration	**Configuration**
Plain	Plain

Interior	SDB
Tool	**Tool**
plain	plain
Technique	**Technique**
plain	plain
Configuration	**Configuration**
Plain	Plain

Nature of Delimiters	Ochre Wash
FP	Absent

Image

Vessel Number 34 Catalogue Number 13H22A5-1

Technological

Temper Type	Temper Quantity	Temper Size
1	Large	X-Large

Consistency of Fabric	Coil breaks
Chunky	Absent

Surface Modification

Rim Exterior	Rim Interior
combed	combed

Body Exterior	Body Interior
combed	combed

Shape

Lip Form
straight

Castellation
uncastellated

Rim Orientation
outflaring

Exterior Rim Profile
concave

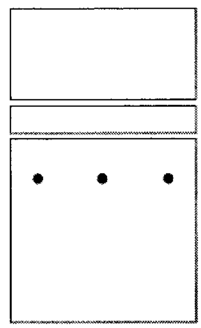
Interior and exterior wall relationship
parallel

Interior Rim Profile
straight

Metric Attributes (mm)

Lip Thickness	Body Thickness
9	10.8

Rim Thickness	Rim Diameter
10	260



Interior

Lip

Exterior

Stylistic

Lip

Tool	Technique	Configuration
plain	plain	Plain

FDB

Tool	Technique	Configuration
plain	plain	Plain

Interior

Tool	Technique	Configuration
plain	plain	Plain

SDB

Tool	Technique	Configuration
plain	plain	Plain

Nature of Delimiters	Ochre Wash
FP	Absent

Image

Vessel Number 35 Catalogue Number 13H38C541-1

Technological

Temper Type	Temper Quantity	Temper Size
1	Large	Medium

Consistency of Fabric
Well-Knit

Coil breaks
Absent

Shape

Lip Form
straight

Castellation
uncastellated

Rim Orientation
outflaring

Exterior Rim Profile
concave

Interior and exterior wall relationship
converging

Interior Rim Profile
convex

Stylistic

Lip

Tool
dentate

Technique
stamped

Configuration
Oblique Right

FDB

Tool
dentate

Technique
stamped

Configuration
Horizontal

Interior

Tool
dentate

Technique
rocker-stamped

Configuration
Vertical

SDB

Tool
No SDB

Technique
No SDB

Configuration
No SDB

Nature of Delimiters
Absent

Ochre Wash
Absent

Surface Modification

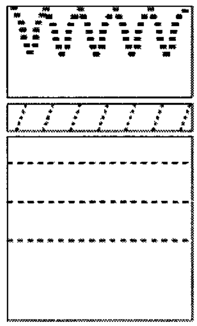
Rim Exterior	Rim Interior
wiped	wiped

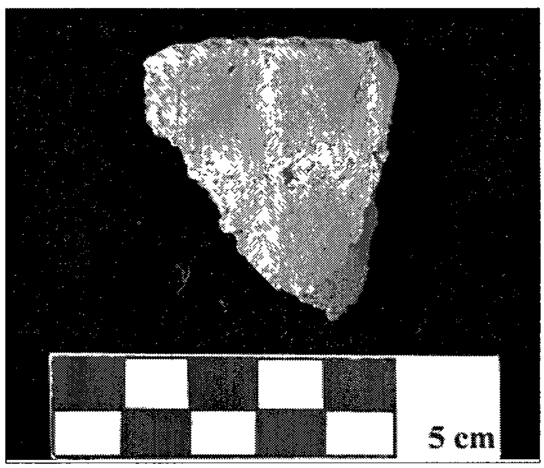
Body Exterior	Body Interior
wiped	wiped

Metric Attributes (mm)

Lip Thickness	Body Thickness
6.3	7.2

Rim Thickness	Rim Diameter
7.9	180


Interior
Lip
Exterior



Image

Vessel Number 36 Catalogue Number 13H21K8-1

Technological

Temper Type	Temper Quantity	Temper Size
1	Large	X-Large

Consistency of Fabric	Coil breaks
Intermediate	Absent

Shape

Lip Form
convex

Castellation
uncastellated

Rim Orientation
vertical

Exterior Rim Profile
straight

Interior and exterior wall relationship
converging

Interior Rim Profile
straight

Stylistic

Lip

Tool
dentate

Technique
drag-stamped

Configuration
Oblique Right

FDB

Tool
dentate

Technique
stamped

Configuration
Oblique Right

Interior

Tool
plain

Technique
plain

Configuration
Plain

SDB

Tool
dentate

Technique
stamped

Configuration
Horizontal

Nature of Delimiters
Absent

Ochre Wash
Absent

Surface Modification

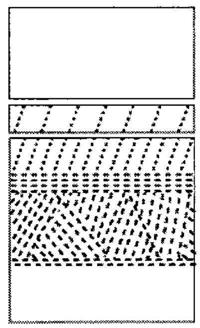
Rim Exterior	Rim Interior
smoothed	combed

Body Exterior	Body Interior
smoothed	combed

Metric Attributes (mm)

Lip Thickness	Body Thickness
6	9.7

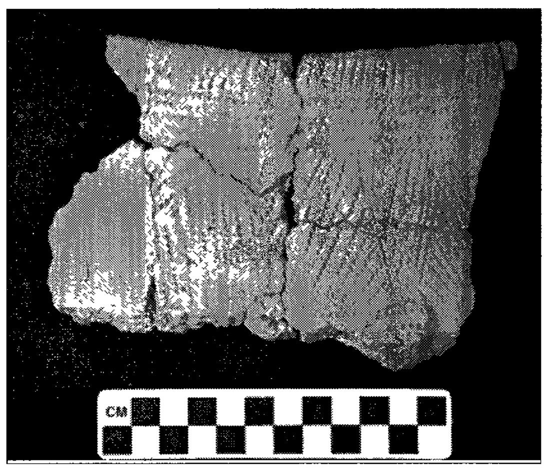
Rim Thickness	Rim Diameter
6.5	260



Interior

Lip

Exterior



Image

Vessel Number 37 Catalogue Number 13H41G411-1

Technological

Temper Type	Temper Quantity	Temper Size
1	Large	Large

Consistency of Fabric	Coil breaks
Chunky	Absent

Surface Modification

Rim Exterior	Rim Interior
wiped	combed

Body Exterior	Body Interior
indeterminate	combed

Shape

Lip Form
straight

Castellation
uncastellated

Rim Orientation
vertical

Exterior Rim Profile
straight

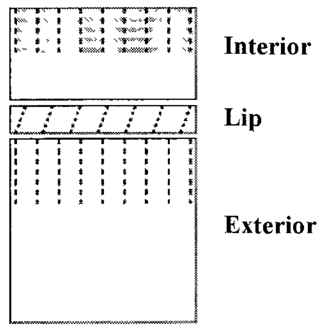
Interior and exterior wall relationship
converging

Interior Rim Profile
convex

Metric Attributes (mm)

Lip Thickness	Body Thickness
6.2	8.5

Rim Thickness	Rim Diameter
8.7	200



Stylistic

Lip

Tool
dentate

Technique
stamped

Configuration
Oblique Right

FDB

Tool
dentate

Technique
stamped

Configuration
Vertical

Interior

Tool
dentate

Technique
drag-stamped

Configuration
Vertical

SDB

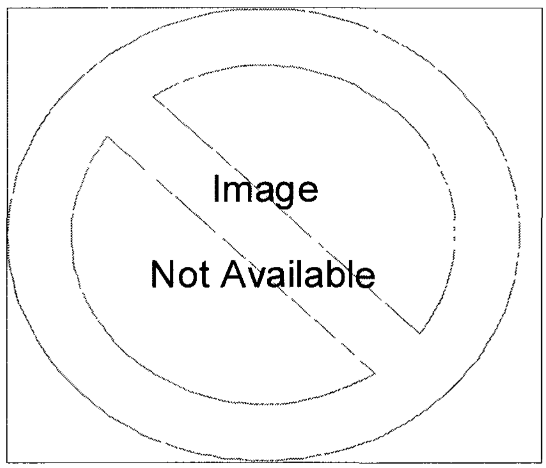
Tool
No SDB

Technique
No SDB

Configuration
No SDB

Nature of Delimiters
Absent

Ochre Wash
Present



Image

Vessel Number 38 Catalogue Number 13H31R422

Technological

Temper Type
5+1

Temper Quantity
Medium

Temper Size
Large

Consistency of Fabric
Chunky

Coil breaks
Present

Shape

Lip Form
convex

Castellation
uncastellated

Rim Orientation
outflaring

Exterior Rim Profile
straight

Interior and exterior wall relationship
converging

Interior Rim Profile
straight

Stylistic

Lip

Tool
dentate

Technique
stamped

Configuration
Vertical

FDB

Tool
dentate

Technique
stamped

Configuration
Oblique Right

Interior

Tool
dentate

Technique
rocker-stamped

Configuration
Vertical

SDB

Tool
dentate

Technique
drag-stamped

Configuration
Horizontal Differenc

Nature of Delimiters
SB

Ochre Wash
Absent

Surface Modification

Rim Exterior
smoothed

Rim Interior
wiped

Body Exterior
wiped

Body Interior
combed

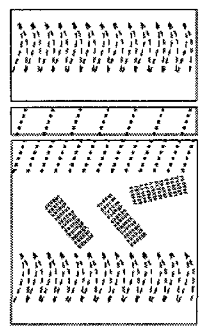
Metric Attributes (mm)

Lip Thickness
7

Body Thickness
10

Rim Thickness
7.5

Rim Diameter
230



Interior

Lip

Exterior

Image

Vessel Number 39 Catalogue Number 13H23F8

Technological

Temper Type	Temper Quantity	Temper Size
4+1	Medium	Medium

Consistency of Fabric	Coil breaks
Laminated	Present

Shape

Lip Form
concave

Castellation
uncastellated

Rim Orientation
outflaring

Exterior Rim Profile
concave

Interior and exterior wall relationship
converging

Interior Rim Profile
straight

Stylistic

Lip

Tool
dentate

Technique
stamped

Configuration
Vertical

FDB

Tool
dentate

Technique
stamped

Configuration
Oblique Right

Interior

Tool
dentate

Technique
drag-stamped

Configuration
Vertical

SDB

Tool
dentate

Technique
stamped

Configuration
Oblique Right

Nature of Delimiters
Absent

Ochre Wash
Absent

Surface Modification

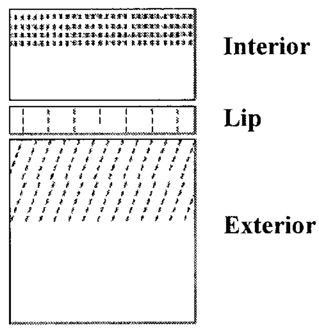
Rim Exterior	Rim Interior
smoothed	smoothed

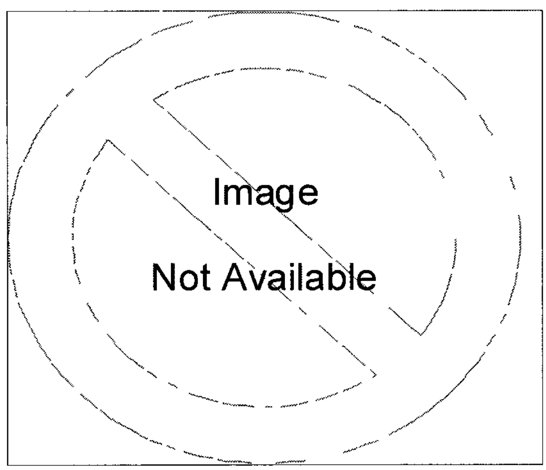
Body Exterior	Body Interior
smoothed	wiped

Metric Attributes (mm)

Lip Thickness	Body Thickness
5.9	6.5

Rim Thickness	Rim Diameter
8	180





Image

Vessel Number 40 Catalogue Number 13H23D6-1

Technological

Temper Type	Temper Quantity	Temper Size
3	Small	Medium

Consistency of Fabric	Coil breaks
Chunky	Present

Surface Modification

Rim Exterior	Rim Interior
smoothed	smoothed

Body Exterior	Body Interior
smoothed	indeterminate

Shape

Lip Form	Castellation
straight	uncastellated

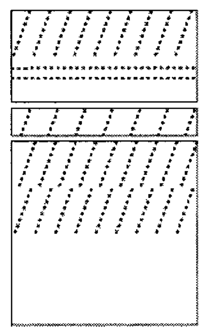
Rim Orientation	Exterior Rim Profile
outflaring	convex

Interior and exterior wall relationship	Interior Rim Profile
converging	convex

Metric Attributes (mm)

Lip Thickness	Body Thickness
5.5	9

Rim Thickness	Rim Diameter
8.7	240



Interior

Lip

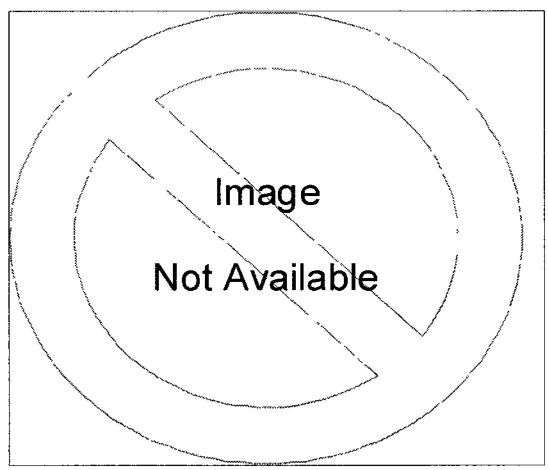
Exterior

Stylistic

	Lip	FDB
Tool	dentate	dentate
Technique	stamped	stamped
Configuration	Oblique Right	Oblique Right

	Interior	SDB
Tool	dentate	dentate
Technique	stamped	stamped
Configuration	Oblique Right	Oblique Right

Nature of Delimiters	Ochre Wash
Absent	Absent



Image

Vessel Number 41 Catalogue Number 13H41C216-1

Technological

Temper Type **Temper Quantity** **Temper Size**
1+6 Large Large

Consistency of Fabric **Coil breaks**
Intermediate Absent

Surface Modification

Rim Exterior **Rim Interior**
smoothed smoothed

Body Exterior **Body Interior**
smoothed combed

Shape

Lip Form
straight

Castellation
uncastellated

Rim Orientation
outflaring

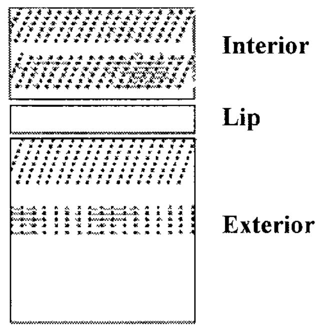
Exterior Rim Profile
concave

Interior and exterior wall relationship
thickened lip

Interior Rim Profile
convex

Metric Attributes (mm)

Lip Thickness 6.8
Body Thickness 6.6
Rim Thickness 6.5
Rim Diameter 240



Stylistic

Lip
Tool
dentate
Technique
push-pull
Configuration
Vertical

FDB
Tool
dentate
Technique
stamped
Configuration
Oblique Right

Interior
Tool
dentate
Technique
drag-stamped
Configuration
Oblique Right

SDB
Tool
dentate
Technique
drag-stamped
Configuration
Vertical

Nature of Delimiters
SB

Ochre Wash
Absent

Image

Vessel Number 42 Catalogue Number 13H23D6

Technological

Temper Type	Temper Quantity	Temper Size
1	Large	X-Large

Consistency of Fabric	Coil breaks
Chunky	Absent

Shape

Lip Form	Castellation
straight	uncastellated
Rim Orientation	**Exterior Rim Profile**
outflaring	convex
Interior and exterior wall relationship	**Interior Rim Profile**
converging	convex

Stylistic

Lip	FDB
Tool	**Tool**
plain	linear
Technique	**Technique**
plain	stamped
Configuration	**Configuration**
Plain	Vertical

Interior	SDB
Tool	**Tool**
dentate	dentate
Technique	**Technique**
stamped	stamped
Configuration	**Configuration**
Vertical	Oblique Right

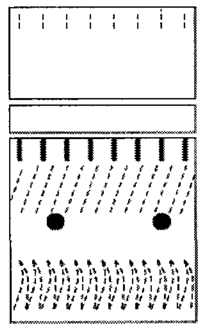
Nature of Delimiters	Ochre Wash
FP	Absent

Surface Modification

Rim Exterior	Rim Interior
smoothed	smoothed
Body Exterior	**Body Interior**
smoothed	superimposed

Metric Attributes (mm)

Lip Thickness	Body Thickness
6.8	9.1
Rim Thickness	**Rim Diameter**
9.7	170



Image

Vessel Number 43 Catalogue Number 13H29S41-1

Technological

Temper Type	Temper Quantity	Temper Size
1+3	Medium	Large

Consistency of Fabric	Coil breaks
Chunky	Absent

Surface Modification

Rim Exterior	Rim Interior
smoothed	smoothed

Body Exterior	Body Interior
smoothed	combed

Shape

Lip Form	Castellation
straight	uncastellated

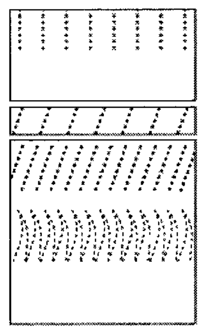
Rim Orientation	Exterior Rim Profile
outflaring	convex

Interior and exterior wall relationship	Interior Rim Profile
parallel	straight

Metric Attributes (mm)

Lip Thickness	Body Thickness
5.3	7.9

Rim Thickness	Rim Diameter
7.7	180



Interior

Lip

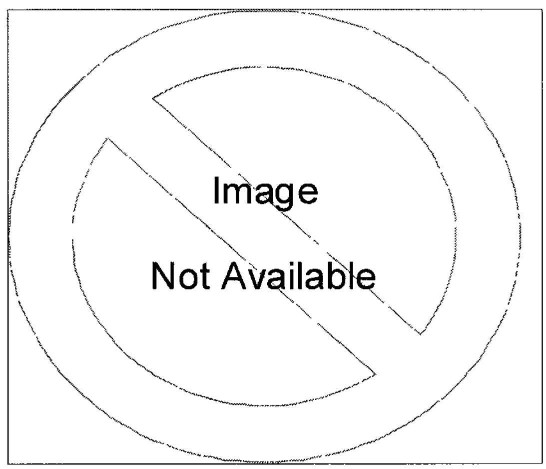
Exterior

Stylistic

	Lip	FDB
Tool	linear	dentate
Technique	stamped	stamped
Configuration	Oblique Right	Oblique Right

	Interior	SDB
Tool	dentate	dentate
Technique	stamped	rocker-stamped
Configuration	Vertical	Vertical

Nature of Delimiters	Ochre Wash
SB	Absent



Image

Vessel Number 44 Catalogue Number 13H38G511-1

Technological

Temper Type	Temper Quantity	Temper Size
1	X-Large	X-Large

Consistency of Fabric	Coil breaks
Crumbly	Absent

Shape

Lip Form	Castellation
convex	uncastellated
Rim Orientation	**Exterior Rim Profile**
outflaring	straight
Interior and exterior wall relationship	**Interior Rim Profile**
converging	straight

Stylistic

Lip	FDB
Tool	**Tool**
dentate	dentate
Technique	**Technique**
stamped	stamped
Configuration	**Configuration**
Oblique Right	Vertical

Interior	SDB
Tool	**Tool**
dentate	dentate
Technique	**Technique**
drag-stamped	drag-stamped
Configuration	**Configuration**
Vertical	Vertical

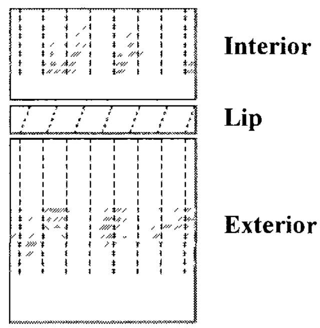
Nature of Delimiters	Ochre Wash
Absent	Absent

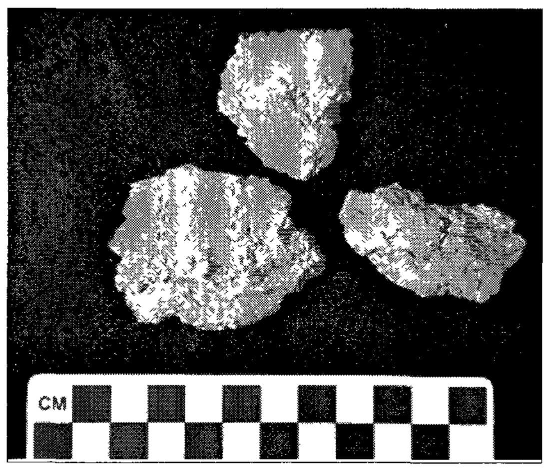
Surface Modification

Rim Exterior	Rim Interior
indeterminate	indeterminate
Body Exterior	**Body Interior**
wiped	combed

Metric Attributes (mm)

Lip Thickness	Body Thickness
7.7	11
Rim Thickness	**Rim Diameter**
9.9	220





Image

Vessel Number 45 Catalogue Number 13H41L611-1

Technological

Temper Type	Temper Quantity	Temper Size
1	Large	X-Large

Consistency of Fabric	Coil breaks
Laminated	Absent

Shape

Lip Form	Castellation
straight	incipient

Rim Orientation	Exterior Rim Profile
outflaring	straight

Interior and exterior wall relationship	Interior Rim Profile
diverging	straight

Stylistic

	Lip	FDB
Tool	dentate	dentate
Technique	stamped	stamped
Configuration	Vertical	Vertical

	Interior	SDB
Tool	dentate	dentate
Technique	rocker-stamped	stamped
Configuration	Oblique Left	Vertical

Nature of Delimiters	Ochre Wash
Absent	Absent

Surface Modification

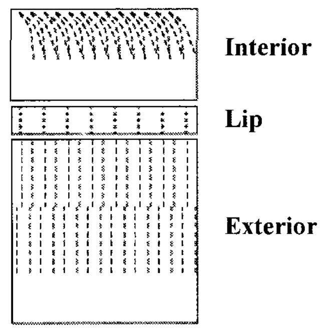
Rim Exterior	Rim Interior
smoothed	wiped

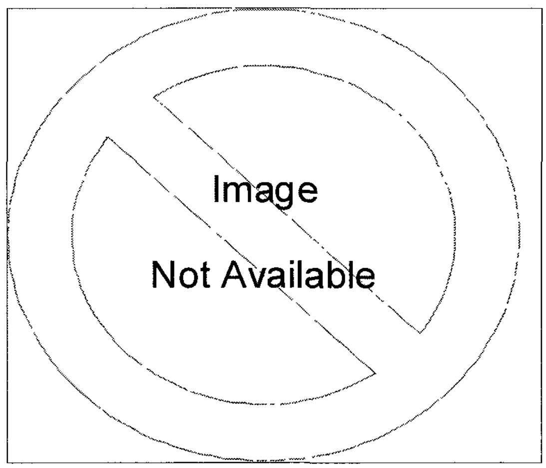
Body Exterior	Body Interior
smoothed	combed

Metric Attributes (mm)

Lip Thickness	Body Thickness
8	7.1

Rim Thickness	Rim Diameter
6.1	200





Image

Vessel Number 46 Catalogue Number 13H38A532-1

Technological

Temper Type	Temper Quantity	Temper Size
1+6	Medium	Small

Consistency of Fabric	Coil breaks
Intermediate	Present

Surface Modification

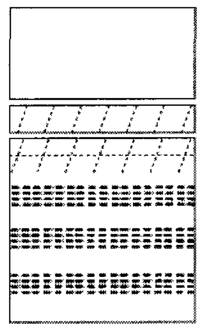
Rim Exterior	Rim Interior
smoothed	combed
Body Exterior	**Body Interior**
smoothed	combed

Shape

Lip Form	Castellation
straight	uncastellated
Rim Orientation	**Exterior Rim Profile**
outflaring	concave
Interior and exterior wall relationship	**Interior Rim Profile**
converging	convex

Metric Attributes (mm)

Lip Thickness	Body Thickness
5.7	6.7
Rim Thickness	**Rim Diameter**
6	190



Interior

Lip

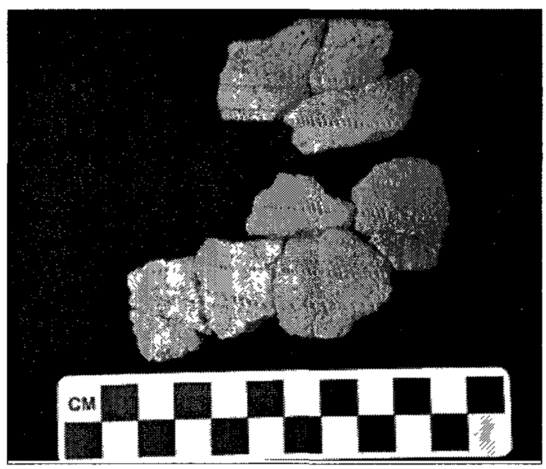
Exterior

Stylistic

Lip	FDB
Tool	**Tool**
dentate	dentate
Technique	**Technique**
stamped	stamped
Configuration	**Configuration**
Oblique Right	Superimposed

Interior	SDB
Tool	**Tool**
plain	dentate
Technique	**Technique**
plain	push-pull
Configuration	**Configuration**
Plain	Vertical

Nature of Delimiters	Ochre Wash
SB	Absent



Image

Vessel Number 47 Catalogue Number 13H30M431-1

Technological

Temper Type	Temper Quantity	Temper Size
1+3+organic	Medium	Large

Consistency of Fabric	Coil breaks
Intermediate	Absent

Shape

Lip Form
straight

Castellation
incipient

Rim Orientation
outflaring

Exterior Rim Profile
concave

Interior and exterior wall relationship
diverging

Interior Rim Profile
convex

Stylistic

	Lip	FDB
Tool	dentate	dentate
Technique	stamped	stamped
Configuration	Vertical	Vertical

	Interior	SDB
Tool	dentate	cord
Technique	drag-stamped	stamped
Configuration	Vertical	Horizontal

Nature of Delimiters	Ochre Wash
Absent	Present

Surface Modification

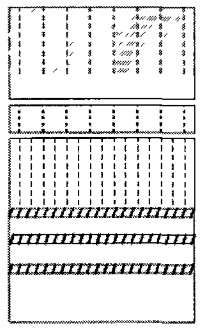
Rim Exterior	Rim Interior
smoothed	smoothed

Body Exterior	Body Interior
smoothed	wiped

Metric Attributes (mm)

Lip Thickness	Body Thickness
7.5	6.2

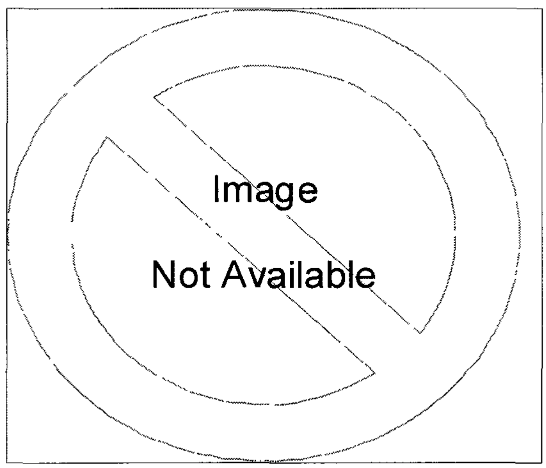
Rim Thickness	Rim Diameter
7.5	210



Interior

Lip

Exterior



Image

Vessel Number 48 Catalogue Number 13H29A42-1

Technological

Temper Type	Temper Quantity	Temper Size
3	Medium	Medium

Consistency of Fabric	Coil breaks
Chunky	Present

Shape

Lip Form
convex

Castellation
uncastellated

Rim Orientation
outflaring

Exterior Rim Profile
concave

Interior and exterior wall relationship
parallel

Interior Rim Profile
convex

Stylistic

Lip

Tool
dentate

Technique
stamped

Configuration
Oblique Right

FDB

Tool
dentate

Technique
stamped

Configuration
Oblique Right

Interior

Tool
plain

Technique
plain

Configuration
Plain

SDB

Tool
dentate

Technique
push-pull

Configuration
Vertical

Nature of Delimiters
Absent

Ochre Wash
Absent

Surface Modification

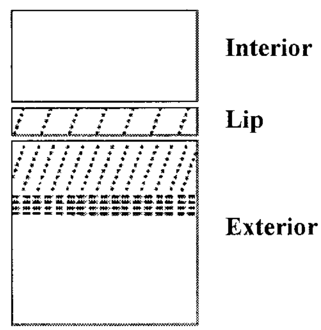
Rim Exterior	Rim Interior
smoothed	smoothed

Body Exterior	Body Interior
smoothed	combed

Metric Attributes (mm)

Lip Thickness	Body Thickness
8.1	9.1

Rim Thickness	Rim Diameter
9.5	180



Image

Vessel Number 49 Catalogue Number 13H42B412

Technological

Temper Type	Temper Quantity	Temper Size
1	Large	Medium

Consistency of Fabric	Coil breaks
Well-Knit	Absent

Shape

Lip Form	Castellation
convex	uncastellated
Rim Orientation	**Exterior Rim Profile**
outflaring	straight
Interior and exterior wall relationship	**Interior Rim Profile**
converging	convex

Stylistic

Lip		FDB	
Tool	dentate	**Tool**	dentate
Technique	stamped	**Technique**	stamped
Configuration	Oblique Left	**Configuration**	Oblique Right

Interior		SDB	
Tool	plain	**Tool**	dentate
Technique	plain	**Technique**	stamped
Configuration	Plain	**Configuration**	Horizontal

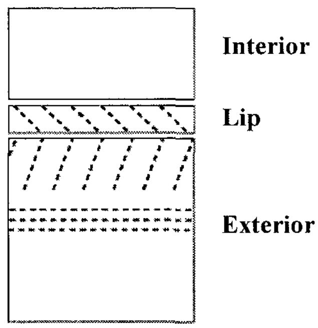
Nature of Delimiters	Ochre Wash
Absent	Absent

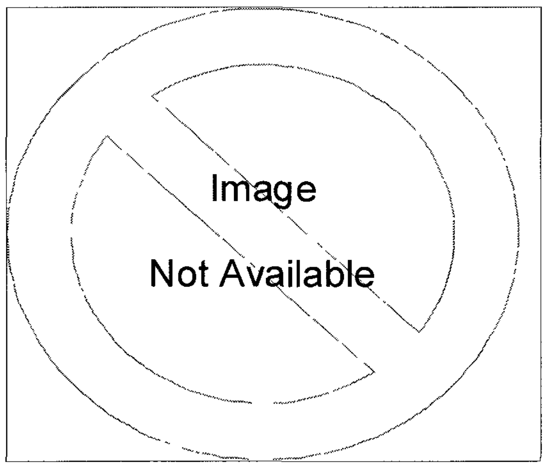
Surface Modification

Rim Exterior	Rim Interior
smoothed	combed
Body Exterior	**Body Interior**
smoothed	combed

Metric Attributes (mm)

Lip Thickness	Body Thickness
5.1	7.4
Rim Thickness	**Rim Diameter**
7.1	160





Image

Vessel Number 50 Catalogue Number 13H31N423

Technological

Temper Type	Temper Quantity	Temper Size
1	Large	X-Large

Consistency of Fabric
Laminated

Coil breaks
Present

Surface Modification

Rim Exterior	Rim Interior
smoothed	combed
Body Exterior	**Body Interior**
smoothed	combed

Shape

Lip Form
straight

Castellation
uncastellated

Rim Orientation
vertical

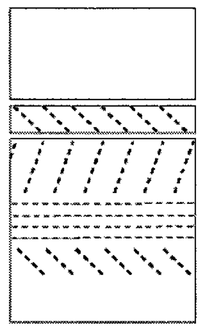
Exterior Rim Profile
straight

Interior and exterior wall relationship
converging

Interior Rim Profile
concave

Metric Attributes (mm)

Lip Thickness	Body Thickness
7.4	8.5
Rim Thickness	**Rim Diameter**
8.6	230



Interior

Lip

Exterior

Stylistic

Lip

Tool
dentate

Technique
stamped

Configuration
Oblique Left

FDB

Tool
dentate

Technique
stamped

Configuration
Oblique Right

Interior

Tool
plain

Technique
plain

Configuration
Plain

SDB

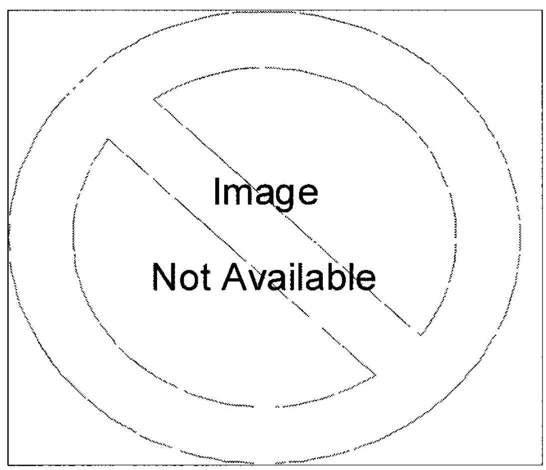
Tool
dentate

Technique
drag-stamped

Configuration
Horizontal

Nature of Delimiters
Absent

Ochre Wash
Absent



Image

Vessel Number 51 Catalogue Number 13H31F414-1

Technological

Temper Type	Temper Quantity	Temper Size
3	Medium	Large

Consistency of Fabric	Coil breaks
Laminated	Absent

Surface Modification

Rim Exterior	Rim Interior
wiped	combed
Body Exterior	**Body Interior**
wiped	combed

Shape

Lip Form
complex

Castellation
uncastellated

Rim Orientation
outflaring

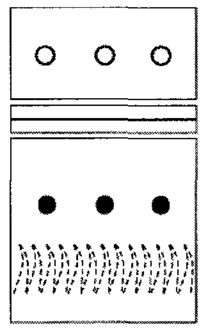
Exterior Rim Profile
straight

Interior and exterior wall relationship
converging

Interior Rim Profile
straight

Metric Attributes (mm)

Lip Thickness	Body Thickness
6.8	8.6
Rim Thickness	**Rim Diameter**
7.1	190



Interior

Lip

Exterior

Stylistic

Lip

Tool
pointed

Technique
incised

Configuration
Horizontal

FDB

Tool
plain

Technique
plain

Configuration
Plain

Interior

Tool
plain

Technique
plain

Configuration
Plain

SDB

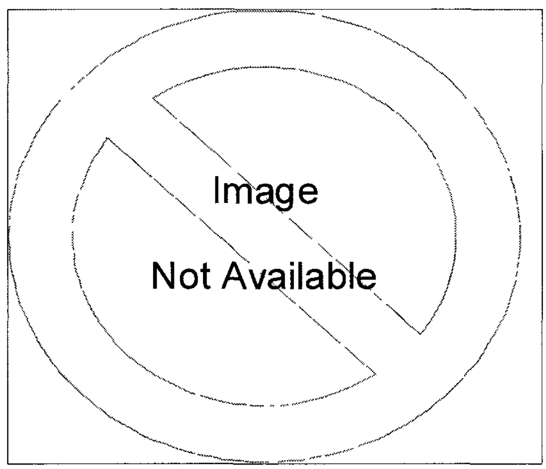
Tool
dentate

Technique
rocker-stamped

Configuration
Vertical

Nature of Delimiters
FP

Ochre Wash
Absent



Image

Vessel Number 52 Catalogue Number 13H21X6-11

Technological

Temper Type	Temper Quantity	Temper Size
1+3	Large	Large

Consistency of Fabric
Chunky

Coil breaks

Surface Modification

Rim Exterior	Rim Interior
smoothed	combed

Body Exterior	Body Interior
smoothed	combed

Shape

Lip Form
convex

Castellation
uncastellated

Rim Orientation
outflaring

Exterior Rim Profile
convex

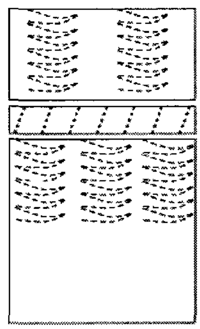
Interior and exterior wall relationship
diverging

Interior Rim Profile
straight

Metric Attributes (mm)

Lip Thickness	Body Thickness
10.7	9.9

Rim Thickness	Rim Diameter
9.8	240



Interior

Lip

Exterior

Stylistic

Lip

Tool
dentate

Technique
stamped

Configuration
Oblique Right

FDB

Tool
dentate

Technique
rocker-stamped

Configuration
Horizontal

Interior

Tool
dentate

Technique
rocker-stamped

Configuration
Horizontal

SDB

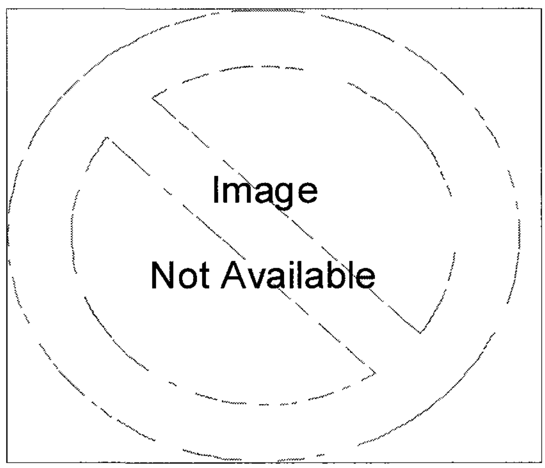
Tool
No SDB

Technique
No SDB

Configuration
No SDB

Nature of Delimiters
Absent

Ochre Wash
Absent



Image

Vessel Number 53 Catalogue Number 13H29G42-1

Technological

Temper Type	Temper Quantity	Temper Size
1	Large	Large

Consistency of Fabric	Coil breaks
Laminated	Absent

Surface Modification

Rim Exterior	Rim Interior
smoothed	smoothed

Body Exterior	Body Interior
smoothed	combed

Shape

Lip Form	Castellation
convex	uncastellated

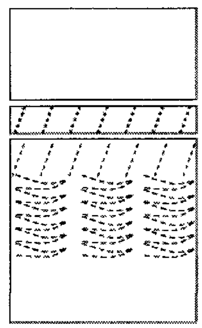
Rim Orientation	Exterior Rim Profile
outflaring	straight

Interior and exterior wall relationship	Interior Rim Profile
converging	convex

Metric Attributes (mm)

Lip Thickness	Body Thickness
7.5	11.9

Rim Thickness	Rim Diameter
10.1	230



Interior

Lip

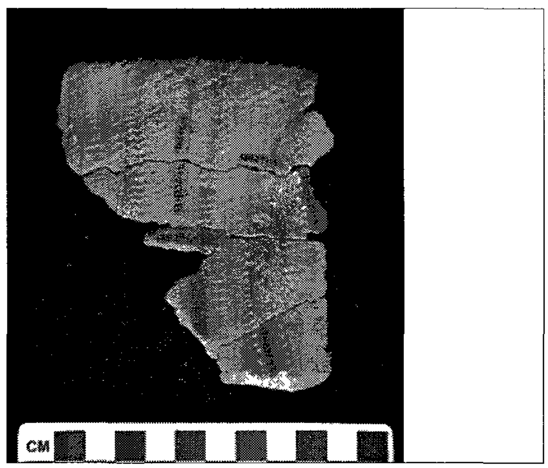
Exterior

Stylistic

Lip		FDB	
Tool	dentate	Tool	dentate
Technique	stamped	Technique	stamped
Configuration	Oblique Right	Configuration	Oblique Right

Interior		SDB	
Tool	plain	Tool	dentate
Technique	plain	Technique	rocker-stamped
Configuration	Plain	Configuration	Horizontal

Nature of Delimiters	Ochre Wash
Absent	Present



Image

Vessel Number 56 Catalogue Number 13H29B42-1

Technological

Temper Type	Temper Quantity	Temper Size
1	Large	X-Large

Consistency of Fabric
Chunky

Coil breaks
Absent

Surface Modification

Rim Exterior	Rim Interior
smoothed	wiped
Body Exterior	**Body Interior**
wiped	combed

Shape

Lip Form
convex

Castellation
uncastellated

Rim Orientation
outflaring

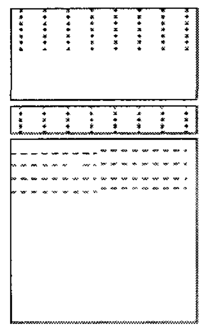
Exterior Rim Profile
convex

Interior and exterior wall relationship
thickened lip

Interior Rim Profile
convex

Metric Attributes (mm)

Lip Thickness	Body Thickness
5.9	8.3
Rim Thickness	**Rim Diameter**
5	140



Interior

Lip

Exterior

Stylistic

Lip

Tool
dentate

Technique
stamped

Configuration
Vertical

FDB

Tool
dentate

Technique
stamped

Configuration
Horizontal

Interior

Tool
dentate

Technique
stamped

Configuration
Vertical

SDB

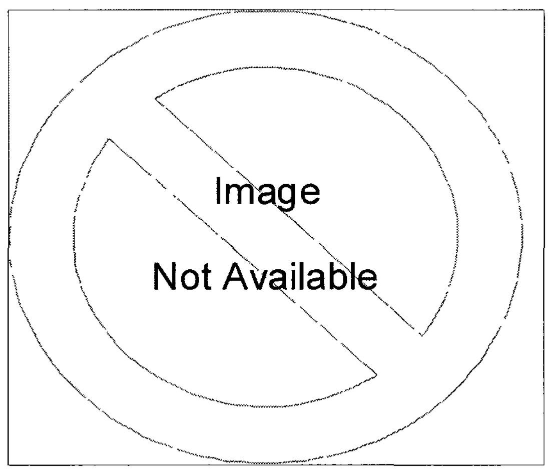
Tool
No SDB

Technique
No SDB

Configuration
No SDB

Nature of Delimiters
Absent

Ochre Wash
Absent



Image

Vessel Number 57 Catalogue Number 13H30U424-1

Technological

Temper Type	Temper Quantity	Temper Size
1	Medium	X-Large

Consistency of Fabric	Coil breaks
Chunky	Present

Surface Modification

Rim Exterior	Rim Interior
smoothed	smoothed

Body Exterior	Body Interior
combed	combed

Shape

Lip Form	Castellation
straight	uncastellated

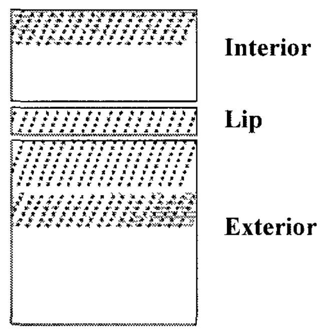
Rim Orientation	Exterior Rim Profile
insloping	concave

Interior and exterior wall relationship	Interior Rim Profile
diverging	convex

Metric Attributes (mm)

Lip Thickness	Body Thickness
7.7	8.9

Rim Thickness	Rim Diameter
7.8	230

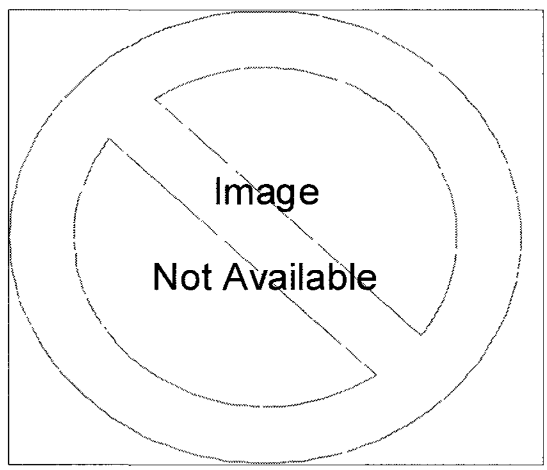


Stylistic

	Lip	FDB
Tool	dentate	dentate
Technique	stamped	stamped
Configuration	Oblique Right	Oblique Right

	Interior	SDB
Tool	dentate	dentate
Technique	drag-stamped	drag-stamped
Configuration	Oblique Right	Oblique Right

Nature of Delimiters	Ochre Wash
Absent	Absent



Image

Vessel Number 58 Catalogue Number 13H29F41-4

Technological

Temper Type	Temper Quantity	Temper Size
1+3	X-Large	X-Large

Consistency of Fabric
Chunky

Coil breaks
Absent

Surface Modification

Rim Exterior	Rim Interior
smoothed	wiped

Body Exterior	Body Interior
smoothed	combed

Shape

Lip Form
complex

Castellation
uncastellated

Rim Orientation
outflaring

Exterior Rim Profile
concave

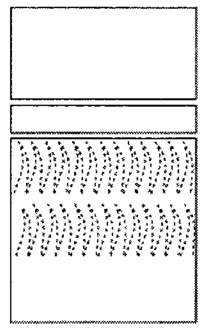
Interior and exterior wall relationship
converging

Interior Rim Profile
convex

Metric Attributes (mm)

Lip Thickness	Body Thickness
7.3	9

Rim Thickness	Rim Diameter
8.3	180



Interior

Lip

Exterior

Stylistic

Lip

Tool
plain

Technique
plain

Configuration
Plain

FDB

Tool
dentate

Technique
rocker-stamped

Configuration
Vertical

Interior

Tool
plain

Technique
plain

Configuration
Plain

SDB

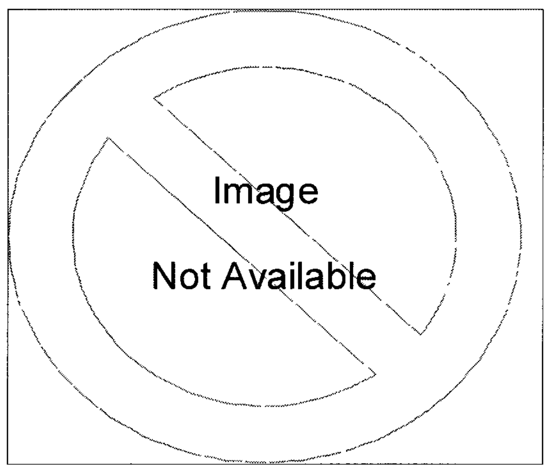
Tool
dentate

Technique
rocker-stamped

Configuration
Vertical

Nature of Delimiters
Absent

Ochre Wash
Absent



Image

Vessel Number 59 Catalogue Number 13H29N44-1

Technological

Temper Type	Temper Quantity	Temper Size
1	X-Large	X-Large

Consistency of Fabric	Coil breaks
Crumbly	Absent

Surface Modification

Rim Exterior	Rim Interior
smoothed	smoothed

Body Exterior	Body Interior
smoothed	smoothed

Shape

Lip Form
convex

Castellation
uncastellated

Rim Orientation
everted lip

Exterior Rim Profile
concave

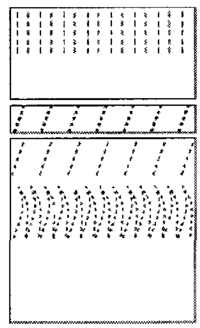
Interior and exterior wall relationship
converging

Interior Rim Profile
convex

Metric Attributes (mm)

Lip Thickness	Body Thickness
9	13.3

Rim Thickness	Rim Diameter
11.3	240



Interior

Lip

Exterior

Stylistic

Lip

Tool
dentate

Technique
stamped

Configuration
Oblique Right

FDB

Tool
dentate

Technique
stamped

Configuration
Oblique Right

Interior

Tool
dentate

Technique
stamped

Configuration
Vertical

SDB

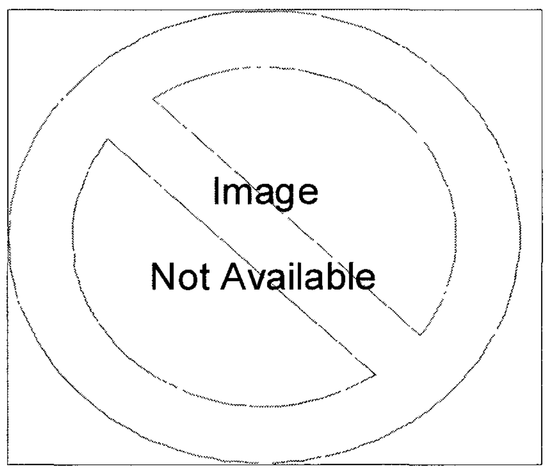
Tool
dentate

Technique
rocker-stamped

Configuration
Vertical

Nature of Delimiters
Absent

Ochre Wash
Absent



Image

Vessel Number 60 Catalogue Number 13H30C412

Technological

Temper Type	Temper Quantity	Temper Size
1	X-Large	X-Large

Consistency of Fabric	Coil breaks
Crumbly	Present

Surface Modification

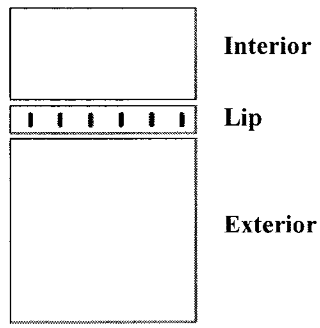
Rim Exterior	Rim Interior
wiped	smoothed
Body Exterior	**Body Interior**
wiped	indeterminate

Shape

Lip Form	Castellation
convex	uncastellated
Rim Orientation	**Exterior Rim Profile**
outflaring	concave
Interior and exterior wall relationship	**Interior Rim Profile**
converging	convex

Metric Attributes (mm)

Lip Thickness	Body Thickness
8.1	9.4
Rim Thickness	**Rim Diameter**
9.3	170

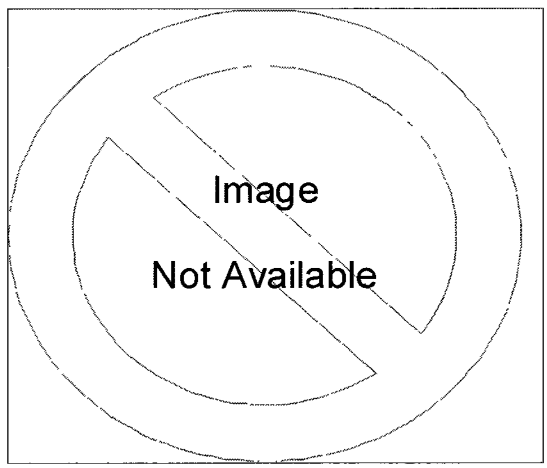


Stylistic

Lip		FDB	
Tool	linear	**Tool**	No FDB
Technique	stamped	**Technique**	No FDB
Configuration	Vertical	**Configuration**	No FDB

Interior		SDB	
Tool	plain	**Tool**	No SDB
Technique	plain	**Technique**	No SDB
Configuration	Plain	**Configuration**	No SDB

Nature of Delimiters	Ochre Wash
Absent	Absent



Image

Vessel Number 61 Catalogue Number 13h21h8-2

Technological

Temper Type	Temper Quantity	Temper Size
1+3	Large	Medium

Consistency of Fabric	Coil breaks
Well-Knit	Absent

Surface Modification

Rim Exterior	Rim Interior
textured	smoothed

Body Exterior	Body Interior
textured	wiped

Shape

Lip Form
straight

Castellation
uncastellated

Rim Orientation
outflaring

Exterior Rim Profile
convex

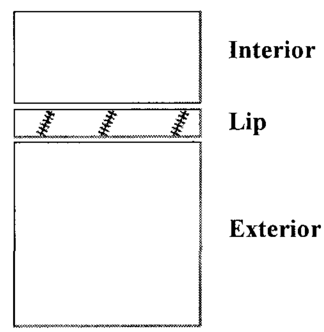
Interior and exterior wall relationship
diverging

Interior Rim Profile
concave

Metric Attributes (mm)

Lip Thickness	Body Thickness
6.4	6.8

Rim Thickness	Rim Diameter
7	200



Stylistic

Lip

Tool
cws

Technique
stamped

Configuration
Oblique Right

FDB

Tool
No FDB

Technique
No FDB

Configuration
No FDB

Interior

Tool
plain

Technique
plain

Configuration
Plain

SDB

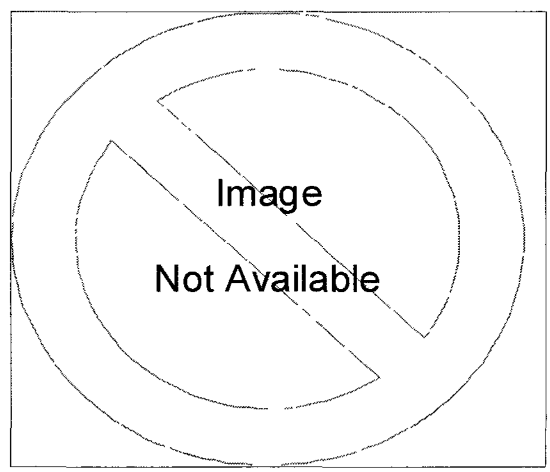
Tool
No SDB

Technique
No SDB

Configuration
No SDB

Nature of Delimiters
Absent

Ochre Wash
Absent



Image

Vessel Number 62 Catalogue Number 13H41A413-1

Technological

Temper Type	Temper Quantity	Temper Size
1	Medium	Large

Consistency of Fabric
Intermediate

Coil breaks
Absent

Surface Modification

Rim Exterior	Rim Interior
smoothed	smoothed

Body Exterior	Body Interior
smoothed	combed

Shape

Lip Form
complex

Castellation
uncastellated

Rim Orientation
outflaring

Exterior Rim Profile
convex

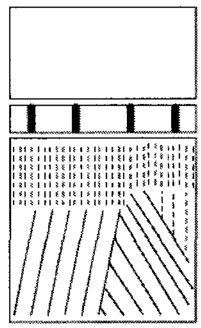
Interior and exterior wall relationship
converging

Interior Rim Profile
concave

Metric Attributes (mm)

Lip Thickness	Body Thickness
4.8	6.3

Rim Thickness	Rim Diameter
6.2	200



Interior

Lip

Exterior

Stylistic

Lip

Tool
linear

Technique
stamped

Configuration
Vertical

FDB

Tool
dentate

Technique
stamped

Configuration
Vertical

Interior

Tool
plain

Technique
plain

Configuration
Plain

SDB

Tool
linear

Technique
incised

Configuration
Horizontal Differenc

Nature of Delimiters
Absent

Ochre Wash
Absent

Image

Vessel Number 63 Catalogue Number 13H38F425-3

Technological

Temper Type	Temper Quantity	Temper Size
1+3	Medium	X-Large

Consistency of Fabric	Coil breaks
Chunky	Absent

Surface Modification

Rim Exterior	Rim Interior
smoothed	smoothed

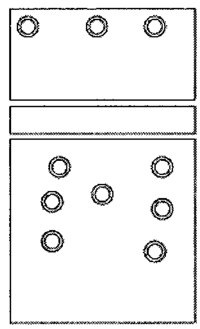
Body Exterior	Body Interior
smoothed	smoothed

Shape

Lip Form	Castellation
convex	uncastellated
Rim Orientation	**Exterior Rim Profile**
vertical	convex
Interior and exterior wall relationship	**Interior Rim Profile**
converging	concave

Metric Attributes (mm)

Lip Thickness	Body Thickness
5.4	9.9
Rim Thickness	**Rim Diameter**
7.7	180



Interior

Lip

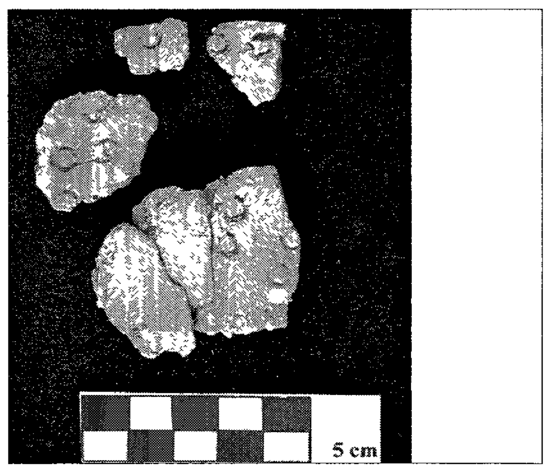
Exterior

Stylistic

Lip	FDB
Tool	**Tool**
plain	annular
Technique	**Technique**
plain	stamped
Configuration	**Configuration**
Plain	Horizontal

Interior	SDB
Tool	**Tool**
annular	annular
Technique	**Technique**
stamped	stamped
Configuration	**Configuration**
Horizontal	Horizontal

Nature of Delimiters	Ochre Wash
Absent	Absent



Image