

**ANALYSIS OF TEXTILE IMPRESSIONS FROM POTTERY
OF THE SELKIRK COMPOSITE**

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ABSTRACT

The boreal forest regions of Saskatchewan and Manitoba are characterized by Late Woodland period archaeological assemblages. Although the pottery associated with these assemblages exhibit textile impressed exteriors, little is known about the associated textile industry. In part, this is due to the lack of archaeological textiles. In order to describe the textile structures employed by these people, it is necessary to study their textile-impressed pottery. Two complexes within the Selkirk Composite, Pehonan/Keskatchewan and Kame Hills are known through several intensively excavated sites and a large number of pottery recoveries. Using textile attribute studies, data on 47 impressed vessels from 17 sites were collected. Supplemented by ethnographic and historical reports from neighbouring regions, textile structures are identified for both complexes. The most represented textile structure is twining. These identified structures verify the homogeneity of the Selkirk Composite. There are enough structural variations, however, to support the regional expressions of each complex. The impressed textiles are utilitarian in nature and played an integral part in pottery manufacture. Selkirk potters were expert craftpersons. This is reflected in their pottery and in the way they employed the textiles. Although the analysis is limited to textiles used in pottery construction, cursory textile comparisons indicate the Selkirk textiles have more similarity to those produced historically by Algonquians to the south.

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CHAPTER ONE

1.0 INTRODUCTION

1.1 General Introduction

The textile industry found among pre-contact peoples of the boreal forest and parkland regions of Saskatchewan and Manitoba has been little studied and is poorly understood. There are several reasons for this. First, although they had important textile industries, ethnographic and historical records pertaining to them are scant. Secondly, due to the climatic and soil conditions of these regions, textiles have not survived within the archaeological context. The only means available to derive information about pre-contact textiles within the boreal forest and parkland areas is, therefore, from textile impressions found on pottery.

Pottery from these two regions has been extensively studied and analyzed. However, emphasis has been placed on pottery classification and stylization, focusing on the lip and neck regions of vessels. Body sherds have been treated more generally; often they are merely classified as being "smoothed" or "fabric-impressed."

1.2 Purpose of the Study

The aim of this research is to use pottery in order to identify textile structures which were used by Selkirk peoples. This research is based on the analysis of textile-impressed pottery from two regional variants of the Selkirk composite; one located in the southern boreal forest of central Saskatchewan and the other in the northern boreal forest of Manitoba (Figure 1.1). By describing and analyzing the structures represented in the textile-impressed pottery found in these regions, both qualitative and quantitative information can be derived to assist a better understanding of textile manufacture within this cultural group.

Drooker (1989:1) has noted that few structured, comprehensive studies of textile-related evidence from a given time period or geographical location have been undertaken. The purpose of this research is to study pottery from two intensively investigated regions. Vessels from the Southern Indian Lake sites of northern Manitoba and those recovered from the Nipawin region of east central Saskatchewan will be used for comparative study. The latter have been assigned to the Pehonan complex (Meyer 1981,1984) and Keskatchewan complex (Gibson 1994) of the Selkirk composite and the former to the Kame Hills complex (Dickson 1980) of the same composite. The pottery of these two Selkirk complexes is by no means identical. There are regional variations between and possibly within the assemblages. It is hoped that the present study will assist in determining the distinctiveness of the pottery assemblages of each complex.

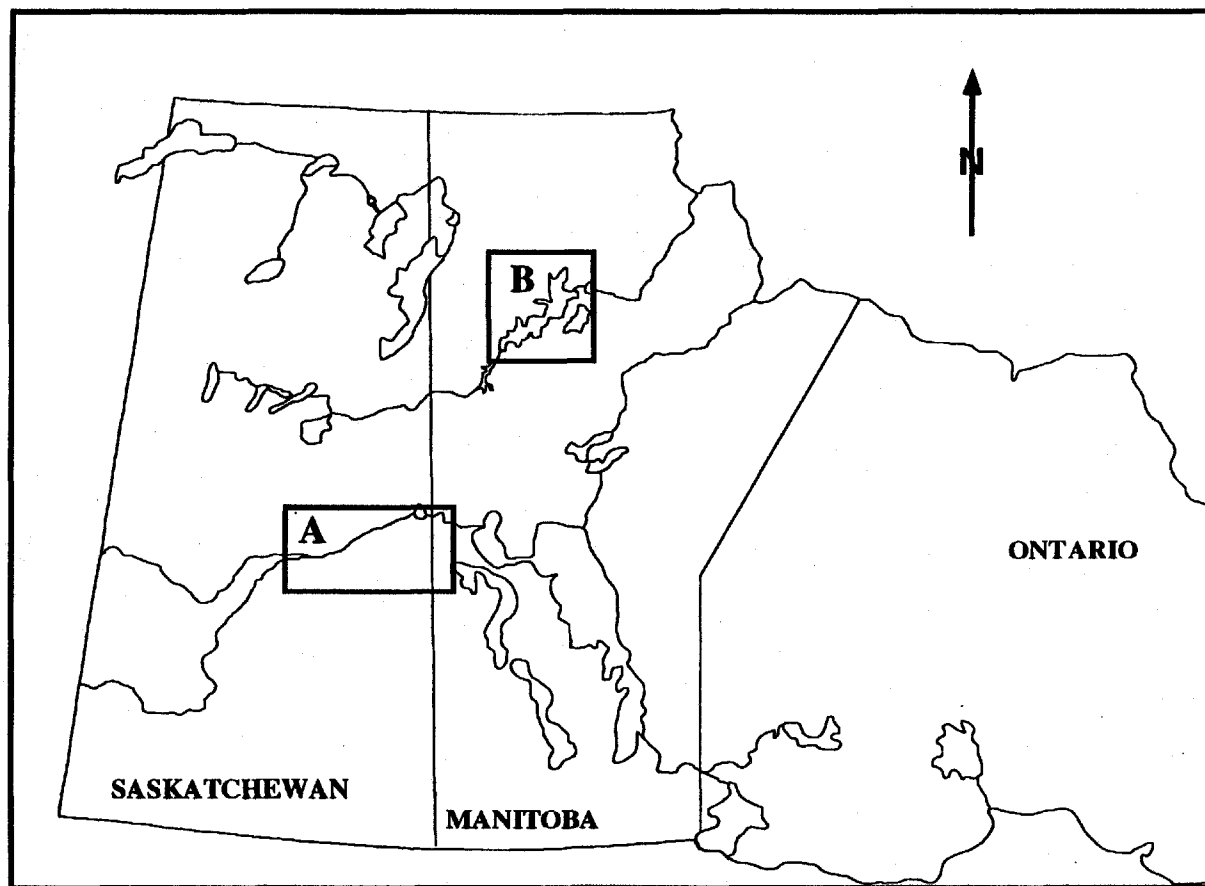


Figure 1.1. Location map of study regions. Box A indicates the Pehonan/Keskatchewan complex and Box B indicates the Kame Hills complex.

1.3 Research Objectives

This research describes and illustrates the textile patterns within the Selkirk composite as revealed by pottery impressions and investigates the possible relationship of textiles to the pottery manufacturing process. The present study of widely distributed expressions of the Selkirk composite has three objectives. The first is to broaden what is known of the material culture by identifying associated textiles. The second is to employ the textile structures to assess the variability or homogeneity within two Selkirk complexes. The third is to help define the distinctiveness of this cultural tradition in relation to neighbouring groups.

There has been detailed interpretation and description of the Selkirk composite and its ceramics; however, very little information can be found in the literature which deals with the analysis of the textile impressions. Saylor (1978:49-54) attempted to reconstruct the structures found on textile-impressed pottery from Wanipigow Lake, north of Winnipeg. However, he did not make plasticine or latex casts of either the impressions found on the pottery or a weave sample but simply compared the pottery impressions to examples of weave patterns (Saylor, personal communication 1993). Therefore, his interpretation must be regarded as tentative.

Syms (1974:1-3) has argued that the study of textile impressions on pottery is necessary for determining how vessels from the Northeastern Plains and the adjacent portions of the Eastern Woodlands were made. It has long been assumed that pottery of the Northern Plains has been made by the paddle-and-anvil technique. Reiterating

observations made by Quimby (1961) and Winfree (1971), Symms (1974:2) argues that the assumption of manufacture using the cord-wrapped or fabric-wrapped paddle-and-anvil techniques cannot be supported in the study of small sherds. Continuous or discontinuous textile impressions may only be differentiated by using large sections of intact or reconstructed vessels. Evidence of impressions which appear to represent continuous small, twisted strands precludes the cord-wrapped or fabric-wrapped paddle-and-anvil techniques.

In her analysis of a vessel from the Bushfield West site, Hanna (1993:31) suggests that a combination of paddle-and-anvil and mold techniques may have been used, based on several features exhibited on the interior and exterior of the vessel. The interior of the Bushfield vessel shows a regular series of shallow depressions which are characteristic surface marks resulting from the use of paddle-and-anvil technique. She states, however, that when a globular body is formed in this manner, the vessel becomes unstable in the shoulder area. The body can then be placed in a mold that will provide support until the shoulder and neck are formed. The continuous textile impressions on the exterior of the vessel suggest that a piece of twined fabric was used as a parting agent between the mold and the clay.

Goltz (1989, 1991, personal communication 1994) has also argued for a reevaluation of manufacturing techniques used in the production of pottery. He has independently developed a similar technique to that described above in his experimental reproduction of woodland pottery of the northeastern United States. He begins a vessel by coiling, the same process used for making Laurel pottery. Once the base is made, he

inverts the vessel form into an interlinked (also called sprang; see Appendix) bag and proceeds to build and shape the vessel within the confines of the bag. The interlinked bag is supported by a deerskin "bag" suspended from a frame. By scraping the interior of the vessel with a bone tool, Goltz can maintain control while producing an expertly even, thin-walled vessel.

Simon (1979) replicated many of the pottery manufacturing techniques recorded for the southern Alberta/northern Montana region. The analysis was based heavily on historical accounts of Blackfoot pottery production compiled by Ewers (1945:289-299). Although the accounts are diverse, Simon (1979:3) found that the primary method of manufacture was by molding, using a rawhide mold or a hole in the ground. Through experimentation, Simon found that molding pottery is a viable manufacturing technology. In contrast to the previous descriptions, Simon (1971:38) found that the vessel form had to be modified after removal from the mold. She found it advantageous to press the clay above the base in a little to help support the weight of the walls.

By examining the textile-impressions on pottery from the Southern Indian Lake and the Nipawin regions, the present study provides more conclusive evidence regarding the role of textiles in the manufacturing processes of Selkirk pottery.

1.4 Justification

Meyer and Russell (1987:22) suggest that Selkirk pottery was derived from interactions of two or more regional cultural groups.

Potential cultural contributors to the initial formation of Selkirk include late Laurel which immediately preceded Selkirk in the boreal forest, as well as Blackduck on the south and Avonlea on the southwest.

Maslowski (1984:51) states that perishable artifacts such as basketry, textiles, cordage and sandals have proven to be of greater diagnostic value in determining pre-contact or historic affiliations and boundaries than have lithic artifacts. By examining widely distributed examples of textile-impressed Selkirk pottery, the present study will help to define the distinctiveness of the Selkirk cultural tradition.

Very little has been done to determine the nature of the textile attributes exhibited on Selkirk pottery vessels. This is due, in part, to the lack of expertise in textile studies and also to the lack of sufficiently large sample sizes. The pottery used in this research was selected from two highly productive and comparatively well studied areas within each region. However, it was necessary to include pottery from several sites in order to obtain a substantial sample size for the two complexes. It is hoped that examining textile attributes will increase our knowledge of the material culture of Selkirk peoples.

1.5 Limitations of the Study

One limitation of this study was the difficulty in obtaining interpretable and clear textile impressions. In order to determine the precise nature of the structure and technological use of textiles impressed on ceramic vessels, a significant portion of the vessel must be intact. Partially reconstructed vessels or large intact sections are a necessity. Due to the nature of some site assemblages or excavation

methods, there may not be appropriately sized samples for analysis. A vessel is sometimes represented by only a small sherd.

Although it is the goal of this thesis to identify the nature of the textiles used, complications are evident. A common practice of Selkirk potters was to smooth the exterior walls of their vessels before the clay was completely dry. This could have been done by rubbing a piece of tanned buckskin across the surface of the vessel or by paddling the vessel to obliterate the textile impression (Meyer, personal communication 1994). In this case, the textile is difficult to identify because only a portion of the weave is registered in the impression.

As well, there are many inherent problems in analyzing casts taken from pottery vessels. King (1978) outlines the problems associated with such a study. These will be addressed in the chapter on methodology.

1.6 Definition of Terms

Definitions for fabric and yarn structure classifications are derived, for the most part, from Emery (1966). Some definitions have been added to expand upon descriptions given. Sources for these variations will be noted. Emery (1966:xvi) defines fabric as a generic term for all fibrous constructions, while a textile refers specifically to woven fabric. Kuttruff (1988:10), however, uses the term textile to include "those fabrics interworked from elements or sets of elements whether or not they are of woven construction." For the purpose of this study, I have adopted the latter term "textile" instead of "fabric" when referring to "textile-impressed" pottery.

1.7 Overview of Following Chapters

The following chapter will describe the methodology employed for this study. Chapter 3 presents a review of literature related to ethnographic and archaeological textile studies, as well as historic and ethnographic accounts of textile use in northern boreal forest regions. A brief overview of the Selkirk composite is given in Chapter 4, in order to better understand the chosen regional complexes. Chapter 5 includes the results of the textile analysis related to the Saskatchewan sites. The results of the textile analysis of the Manitoba sites will be presented in Chapter 6. A summary and discussion of the two tested complexes will be given in Chapter 7. Conclusions are presented in the final chapter as well as recommendations for future research.

CHAPTER TWO

2.0 RESEARCH DESIGN AND METHODOLOGY

2.1 Introduction

This chapter presents the research hypothesis and methodology developed to describe textile attributes which are exhibited on Selkirk textile-impressed vessels. First, the research objectives and hypothesis are presented and discussed. This is followed by the specification and rationale of the sample population. Measurement criteria and other information obtained for each vessel are then presented, as are the procedures used to analyze the data.

2.2 Research Hypothesis

As mentioned in Chapter 1, the overall objective of this research is to ascertain what textile structures can be determined from Selkirk textile-impressed pottery. The research hypothesis proposed is that textiles had a functional purpose in relation to pottery manufacture. Specifically, it is to determine if Selkirk vessels could have been constructed using some form of mold. Most researchers agree that textiles would have facilitated the removal of partially dried vessels from the molds. They may have supported the vessels during subsequent

shaping and finishing processes and/or helped to prevent rapid drying and the consequent cracking of the clay (Hanna 1983:31; Kuttruff and Kuttruff 1992:5; Simon 1979:53-54)

Textile manufacture requires at least three levels of decision making. Each level affects the others and ultimately affects the resulting fabric characteristics, which in turn determines performance in various end uses. These three decision making levels are: 1) fiber selection and processing; 2) yarn construction or structure; and 3) fabric construction or structure (Kuttruff 1986:125; Kuttruff and Kuttruff 1992:7). As in Kuttruff's (1986:125) study, this research can deal only with textiles used in the manufacture of predominantly utilitarian pottery vessels. Therefore, certain fabric characteristics such as high levels of flexibility, strength, and durability would be desirable while others would be avoided. Although only a portion of the total Selkirk textile industry may be represented, this study of textile impressions will contribute significantly to our present knowledge of boreal forest textiles.

It is generally accepted that the Mississippian period salt pans were constructed using some form of mold and that fabrics facilitated the removal of the vessels from the mold (Kuttruff and Kuttruff 1992:5). Drooker (1989,1990,1992) proposed that textiles impressed on salt pans at Wickliffe Mound, Kentucky were constructed for other purposes prior to use in the pottery manufacturing process. She (1989:82-88) tested her hypothesis by considering a series of questions which examined the functional qualities of fabrics in the manufacturing process. Some questions were relevant to this research and are paraphrased below:

1. If fabrics were constructed specifically for pottery manufacture, it is believed they would be of a purely functional type. These would consist of fabrics constructed from simple, standardized structures which would not require a large investment of time or labour. The fabrics would have to be sturdy, flexible and strong. It would be expected that the fabrics would consist of plied yarns, would be of a relatively large scale and relatively unworn. Fabric size and strength would have to correlate with vessel size as the fabrics would have to be strong enough to allow the lifting of a large vessel. The fabric structures and materials would also have to be consistent with easy removal from the clay surface (e.g., not fine and fuzzy), and reuse.

Negative results would imply that the textiles were not made specifically to function in the pottery making process. For example, if the textile is not sturdy, it would not be effective in lifting heavy vessels. Positive results would tend to indicate particular qualities for which the textiles were at least selected, if not actually constructed, and perhaps serve as a clue to their function in the pottery making process.

2. It is important to consider if the textile impressions served a purpose related to vessel use. Could textile impressions have enhanced vessel function? For instance, if they are located on the bottoms of vessels where direct heat might be applied, the resulting impressions would distribute heat more evenly. If they are located on the sides and/or near the rims, the textile impressions may improve gripability. Functional qualities would be evident by the fabrics being consistent in depth of impression and/or in scale.

In general, negative or inconsistent observations would imply that the textiles were applied to the pottery for purposes other than to enhance utility. Positive observations would be inconclusive, demonstrating only that the textiles could have served a functional purpose, not that they necessarily did.

3. By analyzing the visibility, neatness and orientation of textile impressions on the vessels, it may be possible to be determined if the textile impressions were intended to visually enhance the vessels. Because several vessel forms are represented, it is important to observe if textile attributes and/or visibility, neatness and orientation of the textile impressions correlate with some vessel forms but not with others.

Negative results would imply that the decoration of the vessel was not the primary function of the textiles. Drooker (1989:84-85) notes it is impossible to know the actual aesthetic goals of the potters, so it is not possible to be certain whether criteria such as "neatness" are truly legitimate. Positive observations would lead to consideration of what social function(s) such decoration might serve.

4. If not intended exclusively for pottery manufacture, it is important to determine for what possible function(s) the textiles were originally constructed. To do this, it is necessary to know what textile artifacts are known to have been made and used during the late pre-contact period. The distinctive attributes of each type of artifact (size, shape, edge finish, decoration, and textile attributes such as structure, scale, yarn type) would have to be noted. It would then be important to observe which attributes of the textiles are impressed on the pottery. The textiles from the impressions could then be sorted on the basis of

structural characteristics in order to determine if they correlate with textile attributes of known artifacts.

The size range of textiles impressed on Selkirk pottery is also important in considering the original function of the textiles. For instance, if two or more textiles occur together on the same vessel, it would indicate that a single textile did not encompass the entire vessel. Overlapping fabrics may indicate separate pieces or they may represent the two sides of a bag. If opposite sides of the same textile occur on the same vessel, it may be possible to determine the original function by noting the width of the textile.

By examining the textile impressions with consideration given to these series of observations, it may be possible to determine what role textiles had in the manufacture of Selkirk pottery.

2.3 Population and Sampling Procedures

The unit of analysis in this study was the pottery vessel. The criterion for vessel selection was large reconstructions where the presence of continuous interworking of elements could be observed. The optimal minimal sample size for analysis would have been 10 cm x 10 cm; however, the samples ranged in sizes from approximately 2.2 cm x 3.3 cm to 21 cm x 32 cm.

The population of sampled vessels consisted of textile-impressed pottery associated with the Pehonan/Keskatchewan and the Kame Hills complexes. These complexes were selected because they are represented by the greatest number of vessels recovered from controlled excavations and surveys. They were also chosen over a scatter of vessels from

different complexes in order that distinct regional characteristics could be observed. Vessels were selected from collections stored at the Museum of Man and Nature, Winnipeg, the Royal Saskatchewan Museum, Regina and Western Heritage Services, Saskatoon.

It would have been ideal if all recovered vessels could have been analyzed. Unfortunately, several factors limited the availability of the number of vessels. For instance, approximately half of the vessels (41 out of 98) recovered from the Bushfield West site are represented by single rim sherds. Another limiting factor was vessels with impressions which were too faint or obliterated by smoothing to properly analyze the impressed textile. Vessels represented by sections with exfoliated/spalled surfaces or encrusted with cooking residue also could not be included. Table 2.1 summarizes the number of vessels examined. Forty-seven vessels were analyzed. Two vessels which were examined, one from HdLw-5 and the other from HiLp-1, had interior and exterior textile impressions. The interior impressions differed structurally from those observed on the exterior and were included in the study. Therefore, the total number of impressed textiles analyzed was 49.

2.3.1 Selection of Sites in Sample

In order to observe the extent of the technology exhibited on textile-impressed pottery of the Selkirk composite, it was felt that a relatively large sample size was necessary. The Pehonan/Keskatchewan and Kame Hills complexes were chosen to determine if there was homogeneity within and between the complexes. Each complex was represented by a significantly large site. Smaller neighbouring sites supplemented the sample size. The nature of the complexes and their

Table 2.1 Summary of Selkirk sites

Site Number	Site Name	Number of Vessels
FhNa-10	Bushfield West	10
FhNa-35	Lloyd	2
FhNa-113	Municipal Camp	1
FkMh-5	The Pas Reserve	1
HcLv-6		1
HdLw-5	Look For Beaver	1
HeLs-16		1
HfLp-1	One Flake	2
HfLp-7		4
HfLp-11	Fire Island	2
HfLp-12		1
HhLp-3	Hats Come In Handy	3
HiLp-1	Kame Hills	9
HiLp-3	Isthmus	4
HiLv-6		1
HjLw-1	Bruce Taite-Vernon Anderson	3
HkLq-6	First Flooded Little Sand River Rapids	1
17 Sites	Total	47

associated sites allowed for inter- and intra-site comparisons. Data collection and analysis included measurements of selected textile attributes from each vessels from the chosen sites.

2.4 Data Collection and Analysis

Drooker (1992:37) notes that at first consideration, it might seem that analysis of textile impressions on pottery can yield little more than descriptions of textile structure types. Previous researchers, such as King (1978:90-91), caution strongly on the restrictive nature of the data available from textile impressions. Principle problems of identification include the inability to identify fibers or colours. Only small pieces of fabric can be studied, since most impressions are preserved on relatively small-sized sherds. Structures of a fabric may be observed, but the technique or method of manufacture cannot always be inferred from the structure. Often several quite different techniques will produce visually identical results. Drooker (1992:37-38) argues, however, that by employing data recovered from textile impressions with that obtained from existing textile artifacts, in conjunction with information from ethnographic and early historical accounts of textile production and use, we can begin to construct a fuller picture of the importance of textiles.

It is very difficult to observe details of textile manufacture on pottery vessels. Positive molds are necessary in order to reproduce the actual appearance of the original textile. Some researchers (Kuttruff and Kuttruff 1992:7) use modeling clay for this purpose. Drooker (1989:95, 1992:251) prefers the use of a modeling clay product called "Sculpey" which can be used repeatedly or can be hardened by oven baking.

It was decided that more permanent molds were preferable for this study. Several constraints were placed on the analysis of the sample vessels. Re-examinations of some vessels were not possible or advised due to the fragile nature of the vessel reconstructions. Selkirk vessels are noted for their thin-walled construction. Reconstructed vessels are usually comprised of several small sherds. Most have exfoliated areas around the breaks which have to be avoided. These factors place restrictions on rigorous examination. By making permanent casts, future analysis will be possible without harming the vessels. An additional benefit of creating permanent molds is that they are transportable and analysis can be done elsewhere.

Latex was used to produce most of the positive molds for this study. Introduced by Rachlin (1955:394-396), this technique provides clear detail of the textile impressions. Most researchers, however, find this method too time consuming as it requires repeated layers of application and many days to dry (Drooker 1989:95, 1992:251). Syms' (1986) modification of Rachlin's technique produces stable, long lasting molds and was adopted for this research. Several layers of latex were applied (at least four), a layer of cheesecloth was added for strength, and at least two more layers of latex were applied to each vessel. Although there are many benefits to producing molds using this method, examination of the vessel is impossible until the latex has dried and is removed.

The modeling clay product, "Sculpey", was used to produce molds for four vessels housed at the Royal Saskatchewan Museum. These vessels were reconstructed and mounted on wire frames ready for

exhibit. This necessitated a speedier alternative method for obtaining information on their textile impressions. "Sculpey" was also used to obtain molds from the interior impressions of small vessels. It should be cautioned that modeling clays or clay products should be tested on a small section of a vessel before being used, as some contain oils which stain the vessel or dissolve the glue used in the reconstructions.

For each textile impression made, the site name, site number, vessel number and vessel location were recorded. Many of the textile features found on the impressions were not clear enough to provide a photographic record. However, portions of the most distinct impressions were scanned using computerized image analysis.

Data collection included visual examination of the textile impressions. It was found that magnification did not enhance the observations. Unaided visual examination of the textile impressions was best. Various light sources enhanced the impressions making observations easier. Drooker (1992:252) found that rotating a cast under side-lighting caused different yarn elements to become prominent, depending on their orientation. In order to be sure no subtle attribute was missed, this was done for all impressions.

Textile attribute data were collected, describing any special characteristics found on the textile impressions. Kuttruff (1988:85-86) noted that as in other studies of archaeological remains, attribute analysis was often hindered by the size and condition of the textiles. This can also be reflected in the nature of textile impressions as well. Fragmentation precluded the collection of data for the textile as a whole. Smoothing of the vessel surface, the presence of residue on vessel rims

and distortions or overlapping observed on the textile impressions, often challenged accurate analysis. However, as much information as could be obtained was recorded for each sample specimen. As in Kuttruff's study, if an attribute dimension could not be recorded, the reason for this was identified as either not applicable or indeterminate. Not applicable referred to instances when an attribute dimension did not apply to a particular textile impression. Indeterminate was used when an attribute dimension appeared to be applicable to a textile impression but could not be determined with certainty or clarity (Kuttruff 1988:86).

Most recorded measurements were averages of five measurements. Sometimes, due to the size of the impression, it was not possible to obtain five measurements. In those cases, the largest number of accurate measurements were averaged together. It should be noted that the measurements do not reflect the actual attribute dimensions of the original textile. Vessels shrink upon drying and when fired. By the time clay reaches the leather-hard stage, it can shrink between 5% to 8% (Rhodes 1957:14). Further shrinkage occurs when a vessel is fired. This can be from 6.5% to 18.5% depending on the clay type and temperature (Rice 1987:89).

2.4.1 Textile Attributes Studied

When possible, the following attributes were noted for each textile: fiber, yarn characteristics (such as yarn ply, yarn twist direction and angle, warp and weft diameters) and fabric structure (twining twist direction, numbers of warp and weft elements per centimetre, finished edge structures). In addition, fabric count, fabric density and modified Textile Complexity Indices were computed from the raw measurements.

Fabric wear and manipulation were also observed. Information relative to vessel size and shape was observed as was the textile orientation relative to the vessel rim. Following is a brief discussion of each of these variables. This discussion is based on the work of Drooker (1989:96-117, 1992:39-58) and Kuttruff and Kuttruff (1992:7-19).

Fiber Type and Amount of Processing

Florian (1989:38) and Sibley et al. (1990:204) indicate that it is almost impossible to identify fibers used by pre-contact people without documentation or references to the possible choices of materials. Therefore, it is expected that textile impressions on pottery will provide a limited source of information about fiber selection and processing. Ethnographic accounts indicate boreal forest peoples utilized both vegetal and animal products as cordage. Although it is impossible to determine what fibers were actually used in the construction of the textiles used in the pottery manufacturing process, Drooker (1989:103-104, 1992:49-50) was able to determine at least whether the fibers had been highly processed. Distinctions were made for fibers with little or no shredding, coarse to medium shredding and fine to very fine shredding. As with Kuttruff and Kuttruff's (1992) study, little to no evidence of extensive fiber shredding and/or separation, such as protruding fiber, was present in the sample impressions. This may have been due to the fact that the characteristic smoothing of the vessel surfaces obliterated subtleties needed to determine fiber processing.

Number of Elements Plied Together

Spun plied yarns are formed by twisting together two or more single yarns. A single yarn, however, is the simplest form suitable for

fabric construction. It can be either unspun or single spun. The number of elements plied together was recorded for both warp and weft when possible. If this could not be determined, as with faint impressions, it was set arbitrarily to 1.

Yarn Twist

The final direction of yarn twist could be either **S** (\) or **Z** (/) (Figure 2.1). This was often difficult to determine from the impressions. If the spin or twist direction could be seen, it was recorded.

Drooker (1992:47) states that final yarn twists are often employed by many archaeologists as an indicator of cultural group identity. Although useful, care must be taken both to ensure an adequate sample size and in interpreting the results of such a study. Other factors which may influence twist direction include personal choice or habit, fiber type (some fibers, such as flax, twist naturally in a particular direction, which is often exploited by a spinner), spinning technology (thigh spinning versus spindle spinning) and cultural decisions (such as constructing yarn for mortuary fabrics differently than those for everyday wear) (Drooker 1992:47).

Angle of Final Twist

As with the yarn twist, the angle of the ply twist was recorded only when it was observed (Figure 2.2). Drooker (1992:48) cautions the amount of twist in weft yarns is often influenced by the twining twist so cannot always be assumed to be an accurate measure. Emery (1966:12) designated a yarn of "medium" twist as having an angle between 10 and 25 degrees and a "tight" twist between 25 and 45 degrees.

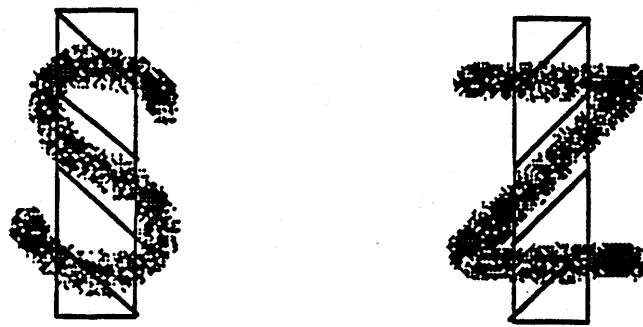


Figure 2.1. Yarn twist direction (from Drooker 1989:102).

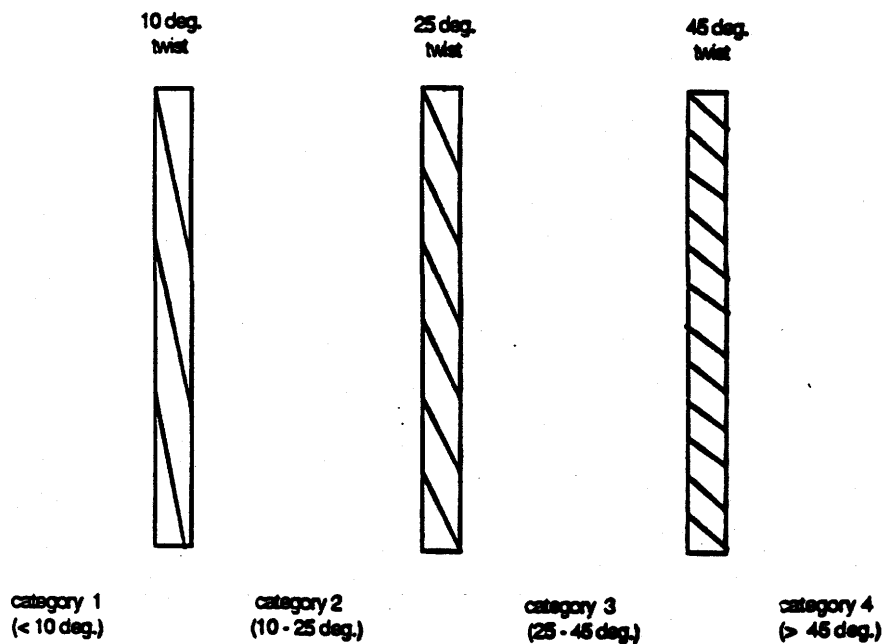


Figure 2.2. Yarn twist angle category (from Drooker 1989:102).

Yarn Diameters

The warp diameter was measured in millimetres. This was typically an average of several measurements. The weft yarn diameter was measured similarly to the warp diameter. In tightly twined textiles, it was sometimes difficult to measure a single element. It should also be noted that the twining process can twist a yarn tightly enough to reduce its diameter to less than it would be if serving as a warp.

Mean Yarn Diameter

This is determined by averaging warp and weft diameters of a given fabric. Drooker (1992:50) used this measurement for comparison with published data from other sites for which warp and weft diameters were not given separately. This measurement was not used in this study. In the samples where an element was not measured, it was generally the warp element in a weft-faced twining structure. In their descriptions of historic twined Ojibwa bags, Densmore (1929:158), Lyford (1942:77) and Whiteford (1977:59, 1991:75) indicate warps were constructed from nettle or basswood fibers and wefts were made of cotton twine or reworked wool. Although Whiteford (1991:75) states some earlier bags were made entirely from the same native fibers, it seems apparent that there was a preference for the use of certain fibers for warping elements. The same criteria was not employed for wefting elements. Therefore, it cannot be assumed the diameters of the warp and weft will have the same measurements.

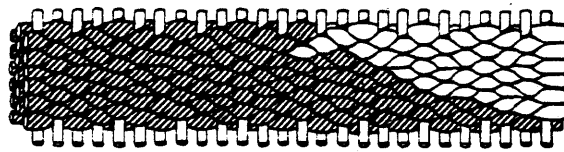
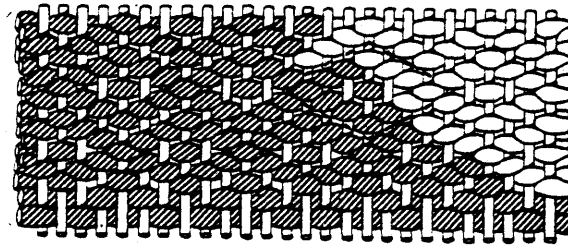
Fabric Structure

As mentioned earlier, the fundamental identifying characteristic of any fabric is its structure - the way its elements are put together. As with

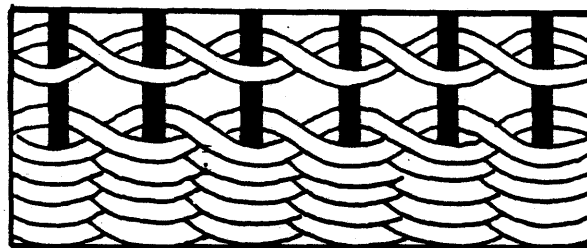
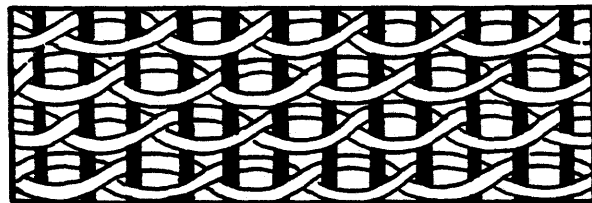
Drooker's and Kuttruff's studies, all structural categories employed in this study follow Emery (1966); her written descriptions and photographs were consulted to aid in identification. Samples of possible structures were also produced to compare with the impressions. Unfortunately, no actual textile artifacts were analyzed for comparative purposes. Two woven bags housed at the Manitoba Museum of Man and Nature were part of medicine bundles and were not available for study (Katherine Pettipas, personal communication 1993).

Weft-faced textiles are well represented in the current research. Drooker (1989:97, 1992:40) notes that weft-faced textiles pose a special problem, because unless some weft yarns are worn away, it is impossible to discern the difference between plain twining and plain interlacing (Figure 2.3). For this reason, Drooker developed the structural category "weft-faced", even though it does not correspond to a single unique fabric structure. Ethnographic accounts indicate most textile production involved the twining technique. There is no record of plain interlacing being used in the production of the large historic period textiles of the boreal forest region. Therefore, it can be assumed the weft-faced textiles represented were produced by twining.

Emery (1966:xv) and King (1978:90-91) also state that the technique by which a fabric was made could not always be identified from its structure. Almost any textile structure can be achieved by different procedures. Selvage structures often give a clue to the technique by which a fabric was produced. In the present study none of the impressions examined contained an observable selvage edge, so it was impossible to demonstrate with certainty which set of elements was



a. (top) plain interlacing
(bottom) weft-faced plain interlacing (from Kent 1983:168)



b. (top) plain twining
(bottom) weft-faced twining (from Burnham 1981:8)
Figure 2.3. Comparing interlaced and twining structures.

warp and which was weft. However, the ethnographical and historical accounts indicate northern Algonquian groups employed the weft twining rather than warp twining technique. These early accounts set the approach taken in this research.

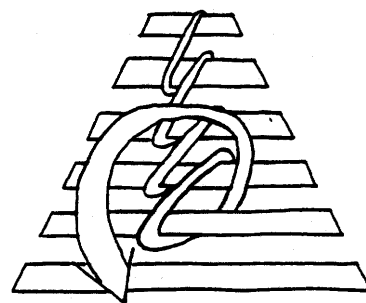
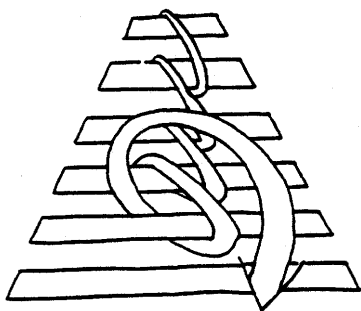
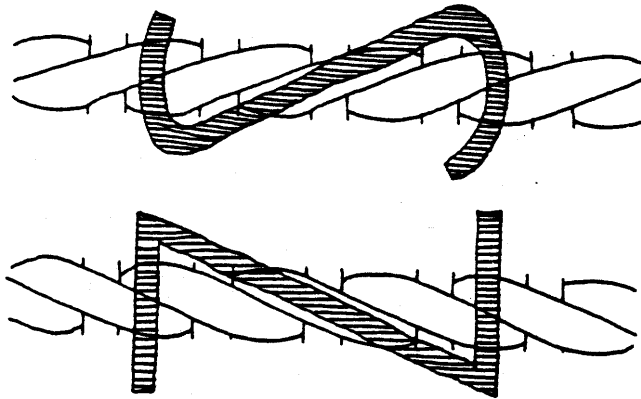
Twining Twist Direction

Twining twist direction can be **S** (\), **Z** (/), or a combination of **S** (\) and **Z** (/) twisting (Figure 2.4). A number of researchers, such as Adovasio and Carlisle (1982:844), consider this to be correlated with culture group identity. However, direction also can be related to technological considerations such as whether or not a weaver is working with warps attached to a frame, whether twining is done horizontally or vertically, and whether the twist of the twining yarn is **S** (\) or **Z** (/) (Drooker 1992:46).

Yarn Elements Per Centimetre

The number of yarn elements per centimetre, warp, weft or both, is a standardized measurement that is used to determine the fineness or coarseness (scale) of a fabric. Fabric scale is generally determined as the sum of warp and weft elements per centimetre (fabric count). However, the number of warp elements per centimetre alone (warp count) sometimes can be a good indicator of scale, because in a twined textile it is influenced not only by the size of the warp yarns but also by the size of the weft yarns.

Warp elements per centimetre were measured by counting warp yarns within as wide as possible a segment of the textile, then calculated to elements per centimetre. Unless indicated otherwise, the number of weft twining rows per centimetre was measured in a similar fashion as



clockwise (**S**)

counter clockwise (**Z**)

Figure 2.4. The direction of the twining twist (from Fraser 1989:41).

the warp ends per centimetre. The weft elements per centimetre were then calculated as twice this number as there are generally two active weft elements which are twisted around a single passive warp element. Braided twining with more than two yarns is difficult to identify by examining only a single side of a textile because it has the appearance similar to that of two-element twining over a single warp. For interlaced textiles, the number of warp elements per centimetre is equal to the number of weft rows per centimetre.

Edge Structures

Although no edge structures were observed in the sample, it should be noted that they are an important attribute. Drooker (1992:48) states they are analogous to rimsherds on pottery but perhaps even more significant. All textile objects have finished edges. Because of their relative complexity and variety, edge structures are probably the most valuable attributes for tracing ethnicity. In her studies of Coast Salish basketry, Bernick (1987:251-256) suggests that selvage types correlate with residence groups, kin groups and/or individual innovation.

Edge structures are often indicators of the function of a fabric. For example, the rim of a bag will have a sturdy finish, whereas a garment may have a fringe. Edge structures can also be used to infer the techniques used in constructing a textile. A flat textile constructed on free-hanging, separate warps can have three distinct types of edges, starting, side and terminal; whereas a textile constructed on a frame with continuous warp, potentially can have almost identical selvages on all four sides (Drooker 1992:48).

From the above raw data, taken directly from the textile impressions, some additional traits could be calculated. They are as follows:

Fabric Count

Fabric count is a measure of textile scale (fineness versus coarseness). It is defined as the number of elements per square centimetre and is calculated as the number of warp elements per centimetre plus the number of weft elements per centimetre. Fabric coarseness or fineness is dependent on both fabric count and yarn diameter. Fabric count can be used to give an approximate relative indication of the amount of time invested in a textile. The higher count fabrics require more time to construct than low-count ones in the same structure.

Fabric Density

Fabric density is defined by the proximity of its component elements. It may give some indication of its use. Opaque fabrics are likely to have different functions than non-opaque fabrics. For instance, a bag intended to store corn would be much denser than one used for washing it. In general, dense fabrics take more time to make than open fabrics, but this is also a function of textile structure and scale. It would take longer to construct a fine, dense fabric than an open coarse one.

Drooker (1990:171) states that the one of the ways to calculate weft density for a twined textile is by measuring weft diameter times the number of weft rows per centimetre. Warp density was computed as warp diameter times the number of warp elements per centimetre. A warp density of 10 indicates a textile in which the warp yarns are just

touching. The total fabric density is calculated as the sum of the warp and weft densities. Fabric densities could not be calculated for many of the textiles observed from the sample because measurements could not be made of warp elements obscured by weft-faced twining.

Textile Production Complexity Index (TPCI)

Kuttruff (1988a, 1989, 1993) developed a systematic measure for determining production complexities of pre-contact textiles from the southeastern United States. Because it is not possible to determine the exact amount of time or energy costs involved in the production of specific pre-contact textiles, the TPCI was devised as a comparative, ordinal scaled index of the number of decisions and amount of labour involved in the production of a given textile. The index takes into consideration fibers, yarns, colouration, patterning and scale. The assigned values for each textile are totaled to obtain a numerical index of complexity, with the higher values indicating greater complexity and increased time and labour costs involved in manufacture (Kuttruff 1988a:80-83; 1988b; Kuttruff and Kuttruff 1992:16).

The TPCI is based upon related literature as well as Kuttruff's personal experience and knowledge of non-industrial textile production. Although there are some studies which describe the processes and steps involved in the manufacture of textiles similar in materials or structures to archaeological textiles remains, detailed ethnographic time studies of non-loom textile production are not available (Kuttruff 1988a:80).

The TPCI does not address differences in procurement costs (of fibers and dyes) or differences in original size. These are difficult to address because of the fragmentary nature of archaeological textile

remains. The TPCI was devised as an indicator of production costs and time involved in manufacture rather than a strict tabulation of the number of production steps. Textiles generally involve the same basic production steps of manipulation of fiber, yarn, colour, patterning and scale. However within these steps, there are many different options or choices and combinations of these options which can be selected by the producer (Kuttruff 1988a:80-81).

Drooker (1989, 1990, 1992) modified the TPCI in her study of Mississippian textile impressions from the Wickliffe Mounds site. Because several factors, such as colour and fiber, cannot be determined from textile impressions, different indices were used. The first modification (Index No.1) was calculated as the ordinal value of the fabric count plus the number of textile structures present. This number could be computed for most of the Selkirk samples analyzed. The second and third could be computed for fewer of the Selkirk impressed textiles because the information could not be obtained from the impressions. Modified Index No.2 was calculated as Index No.1 plus the average yarn ply number. Index No.3 added the warp yarn twist category to the calculations obtained for Index No.2.

Drooker (1992:52) and Kuttruff and Kuttruff (1992:17-18) believe these indices are useful for making both intra-site and inter-site comparisons of pre-contact textile remains. They are potential indicators of social status. They may also be used in determining the relative economic value of different types of textiles within a given site or of textile assemblages from different sites, reflecting allocation of time, resources and effort.

Condition of Each Textile

Evidence of wear was noted during the analysis of the pottery impressions. Wear was indicated through missing or broken elements and fabric distortion. Fabric distortion was evidenced by overly irregular twining rows that may have been forced out of their original position by stress applied during use of the textile. Fabric distortion was noted when the angle of intersection between active and passive elements was considerably off the original 90 degree angle (Kuttruff and Kuttruff 1992:27).

Layering of Textile

Layering was noted in this sample. Overlapping textiles may help indicate how they were used in the pottery manufacturing process. One would expect layering or folding if a large flat textile was placed in a curved, basin-shaped mold in order to facilitate the lifting of a vessel.

2.4.2. Vessel Attributes Studied

Drooker (1992:52-54) notes that a number of vessel attributes have direct relevance to interpreting the nature of textiles impressed upon them. These are as follows:

Vessel Size

Vessel diameter can be used to estimate the minimum width of textiles used in pottery manufacture. For example, if edges do not appear in the textile impression of a large vessel, it can be concluded that the textile was wider than the diameter of the vessel to which it was impressed.

The correlation between vessel size and the fabric structure may provide clues as to the function of textiles in the pottery making process.

For instance, it would be assumed that relatively sturdy textiles would be necessary to lift large diameter, heavy vessels out of their molds.

Fabric Orientation Relative to Vessel Rim

This observation is relevant in determining how textiles were used in vessel manufacture. The theory that vessels were made inside bags or baskets can be tested by determining whether warp elements were consistently oriented perpendicular to the rim. This trait was observed in small molded flowerpot-shape vessels from Mexico (Drooker 1992:53).

Exterior Versus Interior Impressions

Location of textile impressions was noted. Differences between textile structures found on the interior and those on the exterior may indicate different functions in the pottery manufacturing process. Concave molds may have been used as well as convex.

2.5 Summary

The objective of the thesis is to determine the textile structures exhibited on Selkirk pottery from two complexes. Based on the research goals and the research hypothesis, several projections are made to determine the function of textiles in the manufacture of Selkirk pottery. Since this study is concerned with identifying the attributes associated with textile structures, it was necessary to define the attributes in as much detail as possible. In addition to the raw data, other traits were observed in order to determine how vessel characteristics influenced the nature of the textiles impressed upon them.

CHAPTER THREE

3.0 TEXTILE STUDIES: NEW WORLD ARCHAEOLOGY AND BOREAL/SUBBOREAL EXAMPLES

3.1 Introduction

This chapter explores literature that examines the history of textile studies in North America. The purpose of this review is to place the current study within the context of what is known about the contemporaneous textile industry of the boreal forest. This discussion of relevant literature is divided into two parts. First there is a brief review of the progress of textile studies and how these relate to the study of textile-impressed pottery. This is followed by a summary of textiles described in ethnographic sources, predominantly in northern regions. A brief review of literature relevant to the study regions of central Saskatchewan and northern Manitoba is included here.

3.2 Archaeological Textile Studies

While it is known that weaving in the New World is at least 10,000 years old, the study of textiles is a young field. It is suspected that mat-making, netting, and other textile techniques are far older (Kuttruff 1980:40). King (1976:11) postulates that the basic textile

techniques of cordage manufacturing, twining, looping, knotted netting, oblique interlacing and possibly other single and multiple element construction methods were brought with early migrants into the New World. Adovasio and Andrews (1980:63) concur, adding that observations made from existing textiles and textile-related artifacts from the eastern United States and South America conclusively indicate that twining is the oldest documented technique in the hemisphere and further, that cordage production was established across the length and breadth of the New World by the eighth millennium B.C. at the latest.

Due to the nature of textiles, however, examples of pre-contact work survive only under favorable conditions such as aridity, extreme cold or unique soil conditions. The majority of textile recoveries in North America are those found in association with burial mounds, caves or rock shelters in the southern United States. Textiles have also been preserved by other means. Church (1987:156) describes textile fragments preserved by charring and those preserved by contact with copper. They may also be preserved by water saturation (Croes 1976). Impressions of textiles, however, may be found on metal artifacts as a result of corrosion (Vollmer 1975) or on burned clay fragments (Adovasio and Andrews 1980). However, the major source of information on pre-contact textiles is found on textile-marked potsherds.

Brief histories of archaeological and ethnographical textile studies are presented by King (1974:9-16, 1976:9-12). In these reviews, King illustrates how the study of textiles is a fairly young field. The first publications describing archaeological textiles appear in the late 1800s, but it was not until the 1970s that analysis became more formalized,

with better data collection techniques, measurements and presentation of data (e.g., Adovasio 1977; Drooker 1989; Hurley 1979; Kuttruff 1988; Scholtz 1975). Most information is derived from ethnographic, as well as archaeological findings; however, Kent (1974:31) cautions that there may be no difference except a date in a given tradition between what we call archaeological and what we call ethnographical.

The earliest comprehensive analysis of archaeological textiles was made by Holmes (1884:393-425). He was the first to publish information on North American pre-contact textiles derived from impressions of pottery. His work provides detailed illustrations and descriptions of textiles from the eastern United States. By using ethnographic sources and by experimentation, Holmes attempted to describe the fibers used, the items produced and their function, as well as attempted to reconstruct pre-contact weaving techniques. In later articles, Holmes (1896, 1901) discussed textiles in relation to other forms of material culture and the use of textiles in pottery making and embellishment. Although Holme's publications convey important information, Drooker (1989:22, 1992:9) notes that they lack any sense of the significance of regional and temporal variation.

Miner (1936) was the first to do descriptive, and Willoughby (1938) to do classificatory, studies of the various textile structures produced by eastern North American cultural groups (Church 1987:155). The purpose of these more systematic investigations was to assist in the recognition of cultural differences and regional trends (Drooker 1989:22, 1992:11).

Various studies have been conducted using information gleaned from pottery. Rachlin (1960:80-89) attempted to identify a sequence for the evolution of Protohistoric Cree textiles from Archaic to modern times by analyzing textile-impressed ceramics in relation to the historic weaving complexes of Algonquian and Siouan peoples. Using Rachlin's technique as a model, Johnson (1962) studied pottery from different sites in Kentucky in order to determine whether a relationship existed between Woodland and Mississippian textile-impressed pottery. Drooker (1989:23, 1992:11) notes that from Miner's and Rachlin's data, as well as from additional archaeological evidence reported during the past 30 years, the number of known complex structural variations have significantly increased for Mississippian fabrics.

Scholtz (1975) completed a detailed structural analysis of textile remains, such as cordage, braids, mats, baskets, bags and fabric fragments, from 43 Ozark Bluff sites in Missouri and Arkansas. These artifacts were stored in a museum and lacked intersite provenience. Comparisons were therefore made with other textile objects described in the literature for the Southwest and Eastern Woodlands. Emery's (1966) classification schemes were found to be inadequate for accurate description of some techniques and required expansion to accommodate the total variations in the collection. Scholtz's report included detailed drawings and structural measurements of the studied textile articles. Through her comparisons, Scholtz was able to determine similarities and differences between these artifacts and those from related cultural groups.

By the 1980s, textile studies no longer consisted of only descriptive and illustrative interpretations of analyzed textiles or textile-related artifacts. Hinkle (1984) studied 154 textiles from ten Ohio Hopewell mound sites in order to investigate the process of textile manufacture, both on a technological level and decision-making level. The goal was to define ethnic and/or political units within southern Ohio and the degree of interaction among those units.

Kuttruff (1988a, 1988b, 1993) developed an ordinal index of production complexity to rate textiles found in sites of the southeastern United States. This research explores the use of textile attributes and production complexity in order to compare textiles from high status burials at Spiro with those from low status Caddoan burials of the Ozark rock shelters. The complexity index was designed to study status variables as well as the labour expenditure required for cloth manufacture. This is a new approach and is still in the experimental stages (Kuttruff 1988:167).

Drooker (1989, 1990, 1992) used attribute analysis to determine the functional categories of 1,449 fabrics impressed on pottery at Wickliffe Mounds, Kentucky. By modifying the Textile Production Complexity Index (TPCI) introduced by Kuttruff (1988a, 1988b) to suit the limitations of textile-impressed pottery, and by comparing samples to existing fabrics, Drooker was able to determine textile production and possible use for fabrics identified. Kuttruff and Kuttruff (1992) applied this process to determine textile production and use of fabrics impressed on pottery from Mound Bottom, Tennessee.

3.2.1 Methods for Studying Textile Structures

Due to the different interpretations that may be applied to apparently similar textile attributes, it is important to have cohesive and compatible reference sources. Although it has sometimes become necessary to supplement her data with additional information, Emery's textile classification system is still considered the authority on weaving terminology. The fundamental identifying characteristic of any fabric is its structure -- the way its elements are put together (Drooker 1989:96, 1992:40). Emery defines the components of fabric structures (with their major variations) and structures that are necessary to fabrics. Her work also includes classification, description, illustration and discussion of terminology (Kuttruff 1988:30).

Other comprehensive studies have been made by Adovasio and Hurley. Textile and basketry production are thoroughly detailed by Adovasio (1977) and his associates (e.g., Adovasio and Andrews 1980; Adovasio and Carlisle 1982:840-845). Some of their studies involve the analysis of textile-impressed clay recovered from hearths (Chapman and Adovasio 1977). A complete cordage analysis is described by Hurley (1979). In his manual, Hurley provides a case study in the analysis and interpretation of late Woodland pottery from Wisconsin.

3.3 Ethnographical and Historical Evidence For Textiles in the Boreal/Subboreal Region

A textile industry was well established among aboriginal peoples throughout what is now Canada. Strings and ropes were required for almost everything the people made -- moccasins, snowshoes, fishing

lines and traps (Goodchild 1984:179). However, unlike other areas of North America, there has been very little attention given to the art and material culture for much of this region. In the introduction to their Subarctic symposium, Krech III and Hail (1991:1-5) speculate that focus may be lacking due to the perceived dearth in quantity and variety of artifacts in the Subarctic compared to other regions, as well as a lack of analytical interest among anthropologists, historians, art historians and other scholars interested in richer iconographical traditions elsewhere. In both regards, the Subarctic has been overshadowed by the adjacent Northwest Coast and the Arctic, for which interest in traditional as well as contemporary art and material culture has, for decades, been intense.

This does not imply that the Subarctic has been entirely neglected. Krech III and Hail (1991:1) cite Morice's 1894 survey that detailed Northern Athapaskan material culture. James Isham, a chief factor at Prince of Wales Fort in northern Manitoba, made observations of the local Cree material culture during his stay in 1743 (Rich 1949). Rogers (1983:91) also notes that published reports that deal with or at least refer to the Northern Ojibwa consist, for the most part, of accounts made by traders, missionaries, geologists and travelers.

Krech III and Hail (1991:1) believe it is in the writings of the first anthropologists to visit the Subarctic that the roots of an in-depth, sustained interest in the material culture first took hold. In a tradition started in the eastern portions of the region by ethnographers such as Skinner (1912) and Speck (e.g., 1915), who studied northeastern Algonquians, and in the west by Osgood (e.g., 1937), who detailed the material culture of northern Athapaskan groups, anthropologists slowly

intensified their interest in questions of artifactual distribution, manufacture, function and iconography. This is seen, for example, through Honigmann's (1956) observations of the Attawapiskat Swampy Cree material culture and Rogers' (1967) on the Mistassini Cree.

While the cumulative interest over the years in Subarctic artifacts is impressive, it still pales by comparison with that for neighbouring regions (Krech III and Hail 1991:1). The only Algonquian culture which has been extensively studied is that of the Ojibwa from the Great Lakes region. Various aspects of their material culture have been investigated by Densmore (1929, 1974), Kinietz and Jones (1942), Landes (1971), Lyford (1942), Whiteford (1991) and Yarnell (1964).

Very little is known about the material culture of the northern Algonquian-speaking people. This is due, in part, to their early contact with Europeans (prior to 1670) and adoption of European goods. Few customs were recorded of the Northern Ojibwa and the Western Woods Cree until Skinner (1912) took note of the extent to which their culture reflected Euro-American influences (Honigmann 1981:217; Rogers and Taylor 1981:231). Smith (1981:256-270) indicates that the lack of ethnographic material hampers our understanding of the northern groups such as the Western Woods Cree.

Brasser (1976:11) states that artifacts pre-dating 1850 are extremely rare in museums. He notes that the greater part of collections originate from twentieth century native communities. As such, he believes they document recent cultural change and are not representative of truly traditional cultures. King (1976:9) and Kuttruff (1988:31) also caution that information obtained from later nineteenth and twentieth

century ethnographic studies of textile production may or may not be directly applicable to pre-contact textile production. King (1976:10) notes there are no hard-and-fast rules about what constitutes an ethnographic textile since changes and diffusion have been taking place since crafts began. Indeed most recent studies of material culture are studies of the acculturation process.

Changes have been observed within northern Algonquian groups. These do not always represent acculturation but rather the adoption of new traits for traditional purposes. Thistle (1986:35) notes that material culture change did not occur in wholesale fashion among the Cree prior to 1774 and White (1984:192) believes that the adoption of European material objects did not necessarily endanger the Indians' own cultural values. All trade items were used by the native peoples in their own manner. Karklins (1992:42-49) states that although certain trade items such as beads, ribbons and metals were readily accepted by the Woodland Cree, these items were used merely for adornment purposes and replaced previously used materials such as shells or quills.

Thistle (1986:35) states that most technological innovations adopted by native groups were modified to fit their existing perceptions and social systems, and many European goods were modified for purposes other than those for which they were produced in Europe. For example, the yarns used for early braiding and weaving are of considerable interest. Woolen yarn was not introduced as a direct article of trade to North America until some time after woolen yarn goods were available (Burnham 1981:36). There were many textile fibers used in pre-contact times but the yarns used for European trade woolens had

great appeal and were quickly adopted. It was not long before plain European woolens were given rebirth in textiles by the tedious process of fraying out the fibers from pieces of cloth, re-spinning them, and re-weaving the strands into new patterns and shapes (Brasser 1976:38; Burnham 1981:36; Gilman 1982:106; Whiteford 1991:75). Ray (1974:154) states that trade blankets were among the most sought after article, suggesting that it was old blankets that were unraveled. Densmore (1929:33) indicates that this was the case for the Chippewa (Ojibwa), who were "very thrifty in their use of trade goods."

It is also possible that there was considerable interchange of ideas on textile techniques between native peoples and early Europeans (Barbeau 1972:25; Sturtevant 1976:325). Burnham (1976:356-365, 1981:36) has carefully evaluated Marius Barbeau's (ca., 1937) study of the "braided" Assomption sashes. There has been considerable discussion as to the origin of this complex braiding technique practiced in Quebec. There is evidence for the widespread use of braided sashes back into the eighteenth century, as they were generally associated with the fur trade. It is possible they were popular far longer. There is ample pictorial evidence for the use of braiding in many other decorative forms -- sashes, bandoliers, garters, armbands, headbands and bags among many of the native peoples of the eastern to central United States and Canada (Barbeau 1972:7-14:21-22; Burnham 1976:360), suggesting this weaving style was highly developed prior to contact.

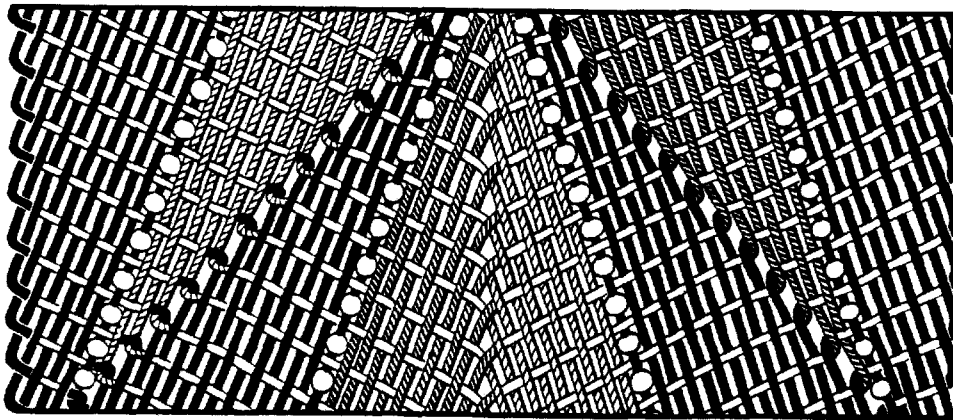
The complex pattern observed in the sashes was made possible by a technique where the yarns, as they interlace, link with each other and make a turn to produce a colour change (Figure 3.1a). Burnham believes

this linking and turning braiding technique did not occur outside of North America. However, a similar process called sprang (Figure 3.1 b) has a wide distribution in the Old World. It has a long history in northern Europe, but has survived in isolated rural pockets in eastern Europe, North Africa, Egypt, Iran, Afghanistan, Pakistan and possibly South America (Barber 1990:122-124; Collingwood 1974:38-39; Kent 1983:70-75). The connection between this northern European technology and the North American braiding technology remains unknown. It is possible that the Quebec women adopted native braiding concepts and elaborated upon the process to the point of making it their own (Barbeau 1972:25; Burnham 1976:359-360, 1981:36).

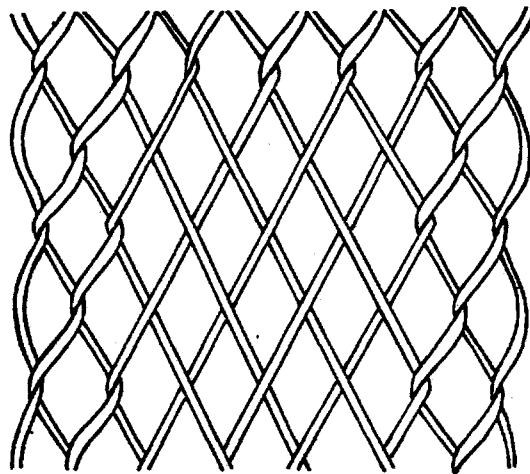
There is historical evidence for the evolution and diffusion of other aspects of material culture. Some examples are directly related to the changing socio-economic environment created during the colonial period, as documented in Brasser's (1975) study of the basket decoration of the Coastal Algonquians. He was able to trace the origin of wood splint basketry in the Northeast to Scandinavia.

Other studies address the movement of ideas or people. This is seen in Whiteford's (1991:74-83) description of decorative bag styles used by the Anishinabe (Ojibwa) of the western Great Lakes forest region. The earliest bags were woven by hanging a set of warp strands over a horizontal stick or cord and twining a pair of weft strands through and around them (Figure 3.2). When the twining was complete, the stick or cord was pulled out and a seamless bag was ready for use.

Whiteford (1991:75-76) states that shortly after the middle of the nineteenth century, a completely different kind of twined bag appeared

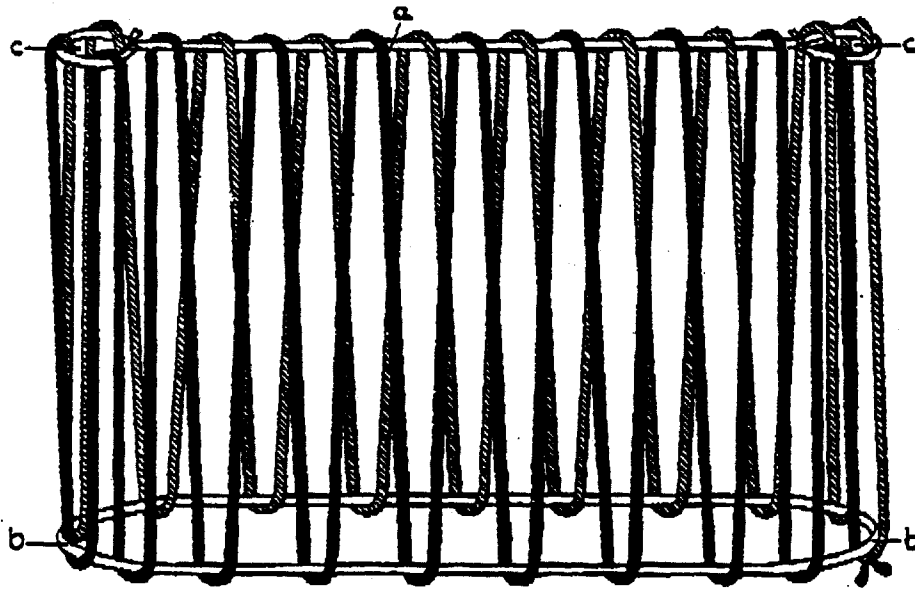


a. example of braiding and interlinking technique
(from Burnham 1981:46)

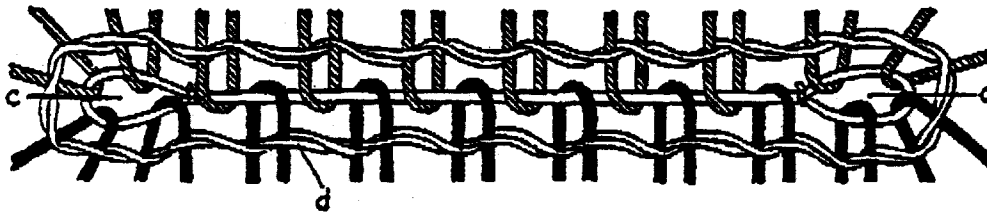


b. example of interlaced sprang (from Collingwood 1974:198)

Figure 3.1. Comparison of North American braiding and interlinking technique with the European interlaced sprang technique.



a.



b.

Figure 3.2. Replication of early Woodland frame (from Douglas et al. 1968:42). It is believed this style was used to make Osage yarn bags. (b) Technique employed to make bags.

among the Anishinabe and many of their neighbours. These bags were not only woven differently, they were made with different materials and had different designs. Whiteford (1991:75-76) describes the construction of these bags as (Figure 3.3):

twined on warps hung on a cord passed around two upright poles or sticks. When the weft strands had been twined through the warps and circled the poles many times, an open tube was formed. It was lifted from the support poles and the upper edges were sewn together to form the bottom of the bag. The bottom seam is a distinctive feature of these yarn bags.

Unlike the alternate-warp, spaced-weft twining techniques employed for the finer examples of the earlier bags, the wefts of these later forms were worked in compact plain and twill twining that produced a weft-faced textile (Whiteford 1991:75). A similar method of manufacture was noted among the Natchez of the lower Mississippi Valley during the mid 1700s, suggesting a possible southern influence (Whiteford 1977:55).

3.3.1 Fiber Material

The native peoples of North America took advantage of the various plant and animal resources available to them. A wide variety of fibers were utilized in archaeological textiles. Fibers varied according to the available resources. Indigenous fibers, such as the inner bark of trees and bast fibers were commonly used. Plant fibers were more commonly used outside those areas of more complex socio-political organizations, but wild animal hair and other products were more widely used than is generally thought. Ethnographic reports record the use of the hair and/or wool of buffalo, mountain goat, rabbit, opossum, moose, caribou, elk,

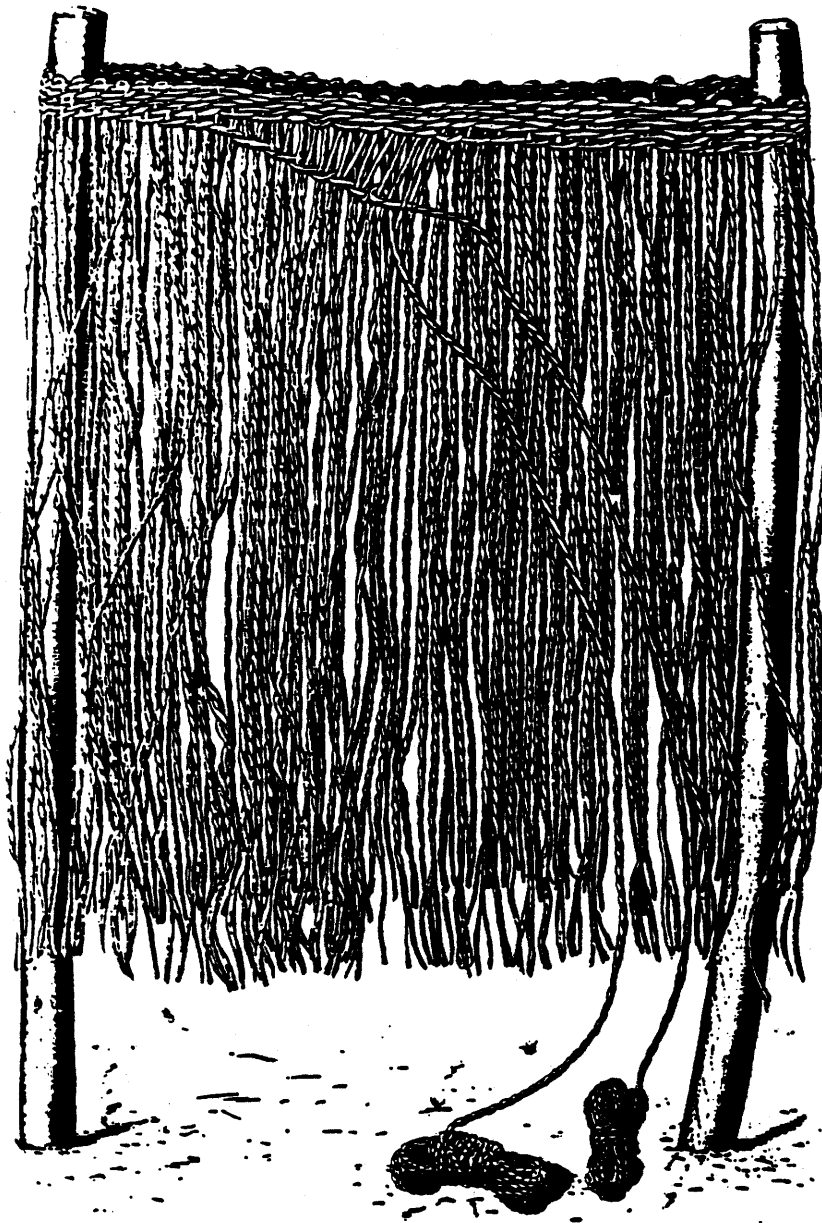


Figure 3.3. Two stick frame (from Lyford 1953:79) employed historically by the Ojibwa to twine tube-like bags.

bear, deer, otter, porcupine and beaver (King 1976:11). Of these animal fibers, only human hair and the dog hair/wool used in archaeological horizons of the Southwest, and probably in the Puget Sound area, could be called domestic. Everything else was gathered from nature (Kent 1975:31).

Comprehensive references to fiber use have been written by Whitford (1941, 1943) and Densmore (e.g., 1928, 1929). Densmore has done extensive studies of the Chippewa (Ojibwa) of the western Great Lakes region. She states that twine was one of the most important articles in the economic life of the Chippewa (Densmore 1974:378). It was made chiefly from the inner bark of the basswood (*Tilia americana*), although slippery elm bark (*Ulmus fulva*) was also used for this purpose. Twine, made from the dry stalks of nettle (*Urticastrum divaricatum*), was believed to be as important as that made from basswood bark (Densmore 1929:20-153, 1974:378). White cedar (*Thuja occidentalis*) and spruce (*Picea rubra*) were also used as cord (Densmore 1974:37; Lyford 1942:44-46). Gilmore (1985:140) notes milkweed (*Asclepias syriaca*) and Indian hemp (*Apocynum cannabinum*) were also utilized for obtaining fine cordage. Moose sinew was coarse and was used for heavy work, whereas deer sinew could be split into exceedingly fine strands and was used for fine sewing and bead work (Densmore 1929:30).

It is not known in detail which varieties of materials the northern forest people used for fibers or to what extent particular materials were used. Honigsmann (1956:28) states that lashing entered into many techniques and different lines suited specialized purposes. Honigsmann

(1981:219) describes the West Main Cree as having the full complement of lines and cords, made from rawhide, dressed hide, sinew, willow bark and spruce root. His (1956:28-29) review of cordage for the Attawapiskat people is much more thorough. The Attawapiskat Cree secured cordage from rawhide, babiche, fully tanned skin, sinew, sealskin, furred rabbit hide, foetal animal pelts, fish skins, willow bark, willow root, spruce roots and grass. The most common cordage was willow bark line and the one most highly recommended was spruce root line. The latter was used for sewing birch bark baskets and canoes.

Leighton (1985:82) indicates that the roots of black spruce (*Picea mariana*) and white spruce (*Picea glauca*), as well as willow bark (*Salix* species) were employed by the Woods Cree of east-central Saskatchewan for string and lashing. Leighton (personal communication 1993) has stated there was no evidence that nettles were utilized by the Woods Cree. It was not known if fibers were ever used for weaving.

In his research on the ethnobotany of the Chipewyan of northern Saskatchewan, Marles (1984: ii) states that snowshoe construction is the only technological art employing plant material. He (1984:99) does state, however, that rope, twine and netting were once made from the inner bark of the willow. Tamarack (*Larix laricina*) roots and white spruce roots were peeled, split and used to stitch birch bark canoes (Marles 1984:92-93).

Osgood's (ca.1937, 1940) earlier studies classified manufacturing of lines as a basic industry and his observations of northern Athapaskan peoples were broader in scope than the ethnobotany study of Marles. Babiche, sinew and tanned skin line were employed by most groups. The

Tanaina also used skin lines from beluga or bear hide and the Ingalik made fish skin line (Osgood 1966:78, 1970:116). Lines were also obtained from willow bark, willow root and spruce root. Use of sedge (*Carex* species) and nettle lines was only noted for the Ingalik (Osgood 1970:114-116).

3.3.2 Cord Manufacturing Techniques

The material and methods used for making cordage were often the same as those employed to produce cords or fibers for the making of baskets, mats or blankets. Sometimes the material for cordage was taken from the plant or animal and used with virtually no processing. Burnham (1981:2) notes that early accounts of spinning techniques refer to the twisting of the fibers between the hand or the rolling of fibers on the thigh. Spindles and whorls were not known to exist in the northern forest regions of North America. Their use, however, has been documented by Northwest Coast groups such as the Tlingit, Salish, Chilkat and Kwakiutl (Samuel 1982:62-64, 1987:25).

Densmore (1929:153) and Lyford (1942:45) quote Skinner's (1921) observations of thigh spinning as seen among the Menomini. Densmore (1929:153) observed that the Chippewa (Ojibwa) used this same spinning process to produce cord from basswood bark. She found the entire process was dexterous and surprisingly rapid.

Rogers (1967:38) observed the Mistassini used the two spinning processes mentioned above in order to twist caribou sinew. The sinew was cleaned, soaked in water and then separated into threads. Each thread was twisted in either of two ways. In the first method, one end of the sinew might be placed in the operator's mouth and the other end

rolled between the palms of the hands. In the second method, the operator twisted the sinew on his or her thighs while in a kneeling position. One end of the sinew was held with the palm of the left hand against the left thigh. The other end of the thread was rolled, always in the same direction, between the palm of the right hand and the right thigh

Cordage served many important purposes. In addition to being employed as warps in rush mats, burden straps and bags, it was used in sewing birch bark containers and canoes. Fibers were also used in tying together tripods designed to support kettles in cooking, in tying house poles together, in attaching floaters and sinkers to fish nets, in netting for snow shoes, and in making fish traps, nets and lines (Lyford 1942:46).

3.3.3 Textile Technology

Ethnographic evidence indicates that textiles made by the native peoples of Canada were constructed by non-loom techniques. The true loom with heddles controlling warp sets did not exist in this region. Kent (1975:31) believes the loom appeared in the Southwest around 700 A.D. along with the cotton plant, as an introduction from Mexico. She argues that there is no good evidence for the use of a true loom in conjunction with non-domestic fibers or dog hair in pre-contact North America.

Loom weaving was concentrated in certain key areas of the Western Hemisphere; the Andean region, Mesoamerica and the intermediate areas of Central America and the southwestern United States. King (1976:12) believes its appearance is explained by diffusion from Mesoamerica or the Andes. It is interesting to note that in the southeastern United States, loom weaving does not appear to have

existed despite the area's close proximity to the southern influences. Instead, intricately twined and netted textiles are more commonly represented (see Drooker 1989, 1990, 1992).

Twining, braiding, netting and looping are more commonly associated with the textile industry of the Subarctic region. The textiles produced were manufactured by hand or by attaching free hanging warps on a frame. Frames were employed by northern Algonquians to make blankets. The Chippewa (Ojibwa) also used frames to make mats. (Densmore 1929:154,159; Lyford 1942:88-89, 123-125).

Densmore (1929: Plate 68,87) illustrates the use of two versions of a hole-and-slot heddle loom (Figure 3.4). One was employed to make belts, the other to hold woven bead work. The bead work frame consisted of warp threads secured by a double piece of birch bark with holes made for the threads to go through. In the mid 1700s, Isham noted the similar use of a bow loom with warps strung through a rectangular piece of birch bark. It was used for the making of powder horn straps, belts and garters (Rich 1949:107-109). Some of the terms applied to variants of this device are rigid heddle, two-way loom, tray loom, lap loom, ribbon loom, tape loom, belt loom, garter loom or gallus loom (Sturtevant 1976:326). Sturtevant (1976:339) claims some generalizations could be made from the distribution of this loom. From his observations, Sturtevant suggests that the loom described by Densmore and Isham, is the only type recorded for the Great Lakes and the northern North American Indians. He believes its appearance is almost certainly due to French Canadian influence as it is the only type recorded for France. This argument could be strengthened by

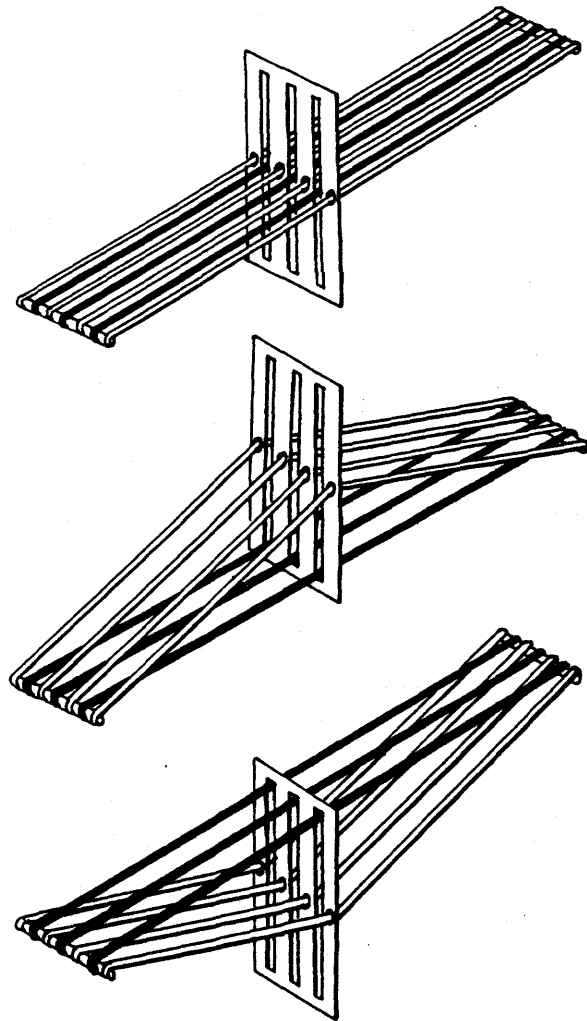


Figure 3.4. Rigid heddle loom (from Burnham 1981:20).

Densmore's (1929:192) description of earlier versions of bead frames which resemble those used for quill work (Figure 3.5). It should be noted that only among North American groups is the loom used for woven bead work. Sturtevant (1976:339) contends this is an innovation after the introduction of trade beads.

3.3.4 Textile Artifacts

Textile objects produced in the northern regions generally served functional purposes. Although it is not known how extensive the textile industry was in the boreal forest region, textile items that can be attributed to this area include robes/blankets, leggings, jackets/coats, fishing nets and snowshoes. Sashes and garters are also known to have been manufactured by the Chippewa (Ojibwa) to the south.

As with the Chippewa (Ojibwa), most northern groups used hides for making garments. Hides, especially those of caribou, were the major materials used for clothing (Rogers and Leacock 1981:177). Fresh, tanned or smoked, skins were utilized to cover the body as well as the dwellings of the people. Smaller skins were converted into a variety of bags and pouches and the fresh skins were cut into rawhide thongs (Brasser 1976:17).

Due to the environment of the boreal forest, there was no incentive for the development of a kind of utilitarian weaving that would depend on rapid production. For instance, if a blanket or a garment was needed, the skin of an animal was a much readier source of material than converting native fibers into woven cloth (Burnham 1981:2).

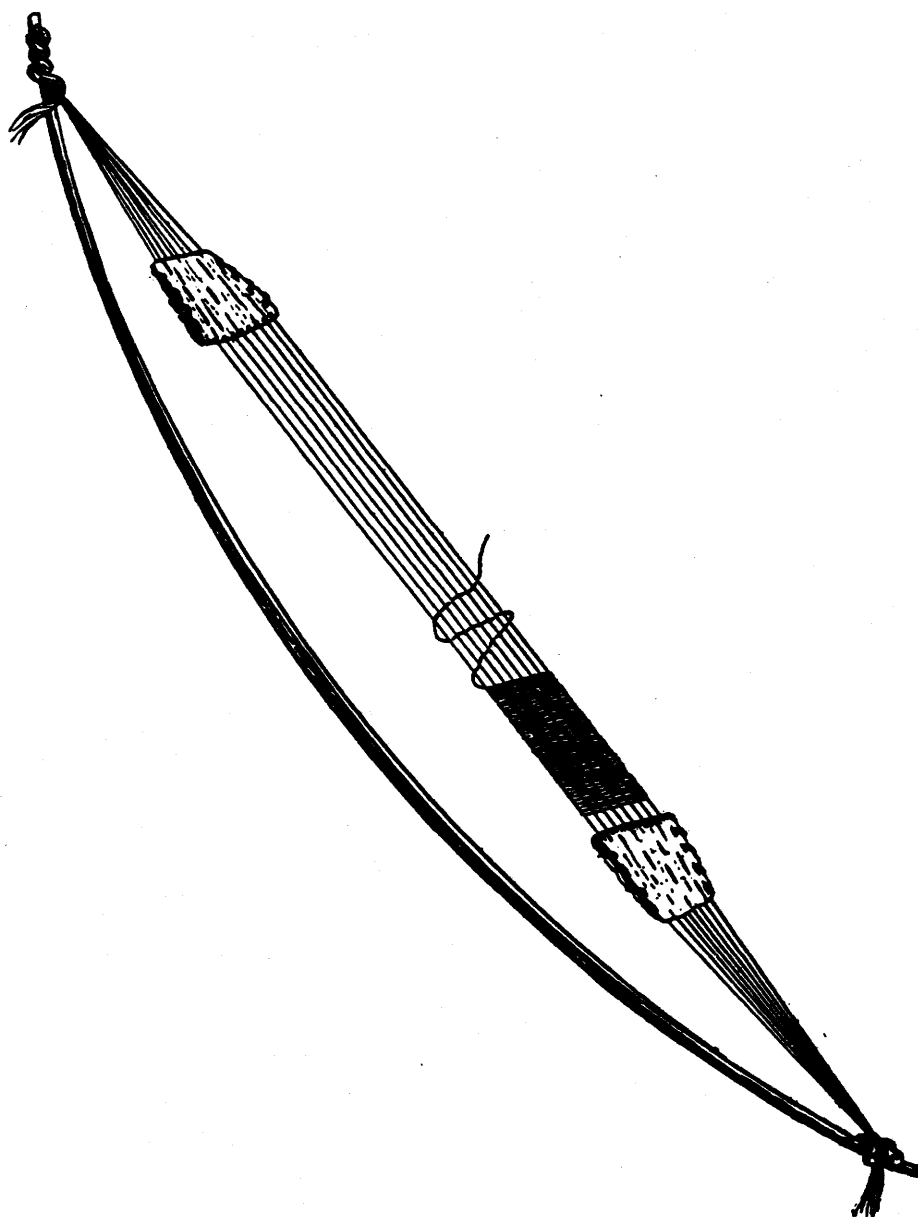


Figure 3.5. Bow loom (from Orchard 1984:57).

Clothing

There was limited use of fiber and animal products in the woven construction of certain garments. Densmore (1929:31, 1974:378) and Lyford (1942:45) state that at one time fine nettle fibers were woven into a cloth that was used for Chippewa (Ojibwa) women's underskirts. Densmore (1929:30) describes the construction of these garments as "woven in a tubular form like the yarn bags."

In Skinner's (1912:17,19) notes on the Eastern Cree, he describes coats with attached hoods made of woven rabbit skins. Men's versions were made like parkas and were pulled over the head. Women's coats differed from those used by the men in that they were laced up the front. Woven rabbit skin moccasins were also worn in winter in traveling over smooth ice as they prevented the feet from slipping.

Skinner (1912:17) observed an interchange of cultural traits among the peoples of Fort Albany. The typical rabbit skin garments of the Eastern Cree were the coat, hood and blanket (Figure 3.6). The Northern Saulteaux, migrating into the territory of the Eastern Cree, borrowed the art of rabbit skin weaving from them. In addition to making coats, they invented leggings, clouts, moccasins and mittens of the same material. The Cree of Albany and Moose Forts, in their turn, adopted these forms from the Saulteaux. Skinner (1912:35-36) describes in detail the manufacturing processes involved in the making of these garments. In his observations of the Attawapiskat Cree, Honigmann (1956:45-47) also observed the use of woven rabbit skin robes, coats, leggings and mittens. No mention was given to the construction of these garments.

Rogers (1967:59-60) notes that rabbit skin jackets, at the time of his field work among the Mistassini Cree, were worn only by children. The jackets were made in separate pieces which were sewn together. Each piece was woven using the same looping technique (Figure 3.7) employed in the manufacture of rabbit skin blankets. The body section was woven in either one or two pieces. If two rectangular pieces were used, they were first sewn together along two parallel edges. Openings were left for arm holes. The pieces were then sewn together along one end leaving an opening for the neck. If one piece was used, holes were left for the arms as it was woven. The piece was then folded in half, and the edges were sewn together. Sleeves and hood pieces were made separately, sewn together, and attached to the body (Rogers 1967:60).

Rogers and Leacock (1981:233) state that the Northern Ojibwa did not rely on rabbit skins until after the establishment of the Hudson's Bay Company (1821-1900) which altered faunal resources and consequently restricted trade goods. They could no longer rely exclusively on moose and caribou hides or European cloth, but began to depend on hare skins, a material that had been worn primarily by women and children.

Robes/Blankets

The making of rabbit skin robes has been practiced over wide areas of North America. They are well documented among Algonquian groups of the boreal forest region and Osgood (1966:77, 1970:71, 1971:660) noted their use among the Tanaina, Han and Kutchin as well. His informants, however, could not furnish any details of their manufacturing process.

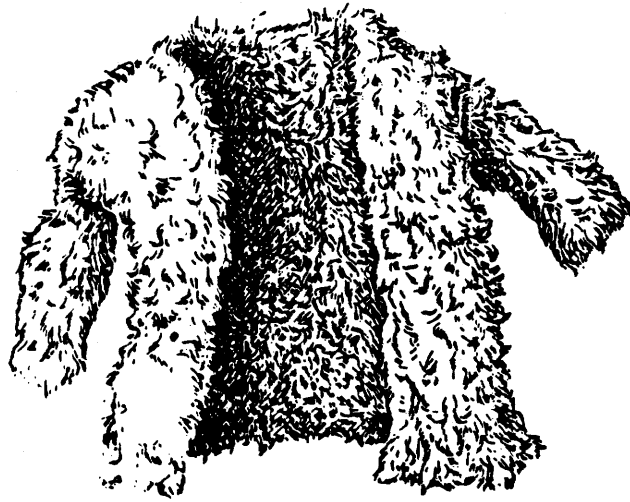


Figure 3.6. Rabbit skin coat (from Skinner 1912:17).

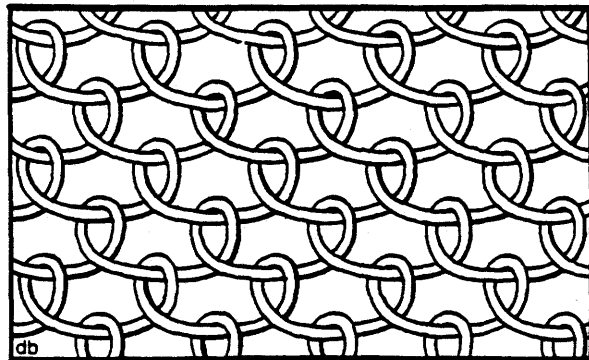


Figure 3.7. Looping technique (from Burnham 1981:3).

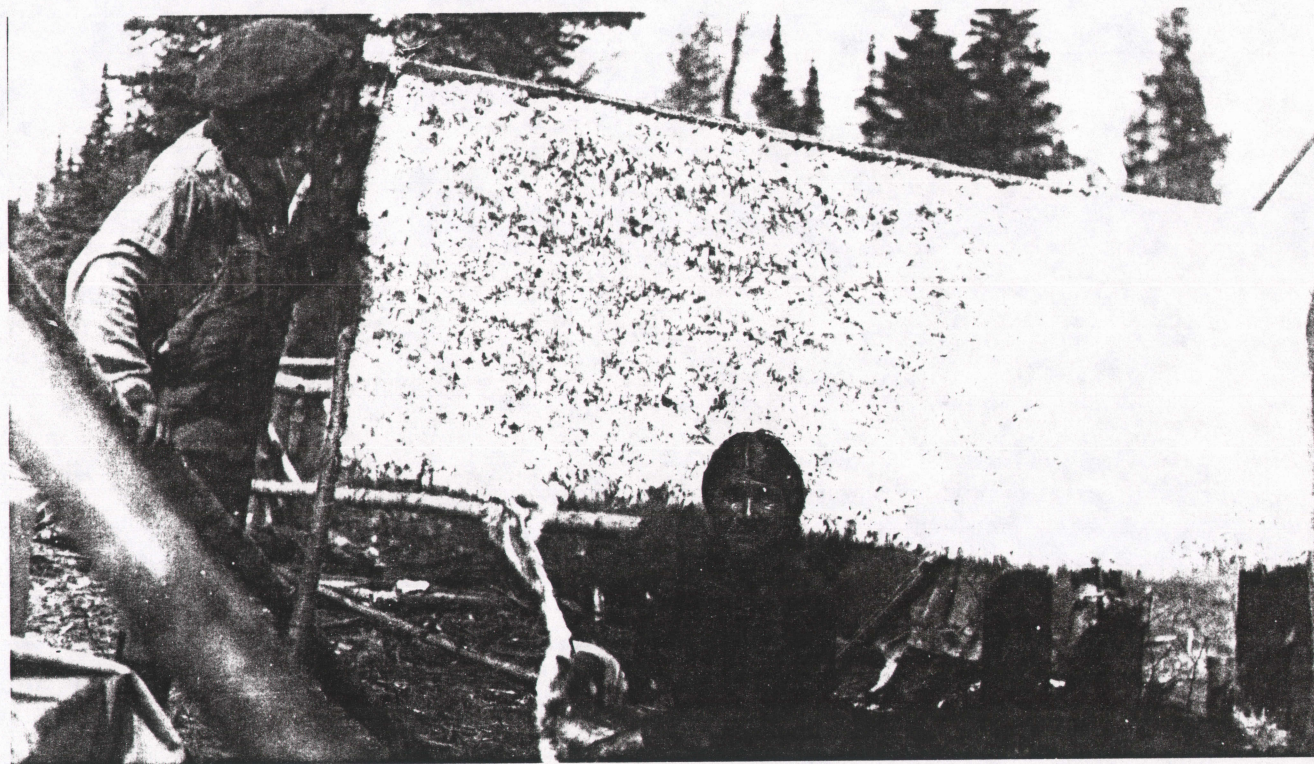


Figure 3.8. Mrs. Nepenskun of Moose Factory, Ontario making a rabbit skin blanket, 1923-30. (Courtesy of the Sam Waller Museum, The Pas, Manitoba.)

Honigmann (1956:28), Lyford (1942:101-102), and Rogers (1967:64) describe the processes involved in the construction of these blankets among Algonquian groups. Several sizes of rabbit skin blankets were made (Figure 3.8). The largest was comprised of one to two hundred skins, whereas fifty to seventy skins provided a single blanket. The blankets were constructed on a three-pole frame of narrow, twisted strips of hare skin. The pelts were prepared by being cut, spirally into long cords. The finished line was twisted to strengthen it. A looping technique was employed in which the strip of hide was conveyed on a wooden or bone needle (Figure 3.9). The thickness of the blanket was determined by the width of the strips and the weight depended on the degree of tension employed in the weaving. The time required to weave a large blanket of two hundred skins was approximately six days (Burnham 1981:3; Rogers 1967:64). Honigmann (1956:29) states that fox pelts were sometimes used the same way.

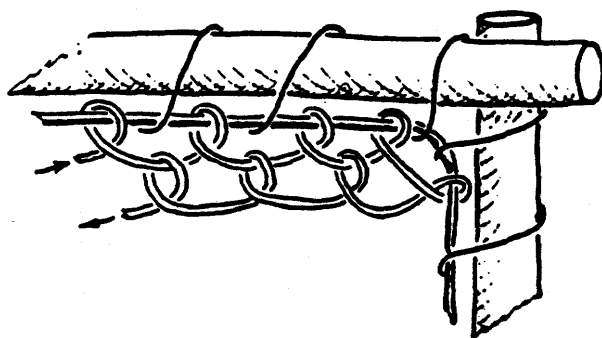


Figure 3.9. A frame with an example of the looping technique used to make rabbit skin blankets (from Rogers 1967:40).

Densmore (1929:161) describes two radically different methods of weaving rabbit skin blankets which were used by the Chippewa (Ojibwa) in northern and northeastern Minnesota. For the one method, although the pelts were prepared the same way as described above, the weaving was done on a warp of cotton twine. A space of about half an inch was left between the rows of rabbit skin. The other sort of blanket was woven "like the netting on snow shoes."

Bags

Bags of various sizes and materials are found throughout North America. In this northern region, specific materials were employed depending on the purpose of the required bag. The peoples of the Great Lakes region were well known for their excellent craft work exhibited in the construction of textile bags. The Athapaskans of the Subarctic also produced a variety of textiles; primarily open-worked netting and looped structures to manufacture fish bags, storage containers, food pouches and hunting bags (Burnham 1981:4).

Textile storage and carrying bags are among the most interesting of the Chippewa (Ojibwa) crafts. Densmore (1929:157-158) and Lyford (1942:77-87) describe the materials used, the types of textile structures employed and the purpose of the completed bag. Twined structures were the most common technique employed by the Chippewa (Ojibwa). The bags were generally made by the process previously described by Whiteford (1977, 1991). Although nettle bags were the oldest of the woven bags, bark from cedar, basswood and slippery elm was also employed for making bags to store wild rice and for holding personal

belongs. Bags made from woven tamarack roots were used for storing medicinal herbs as well as wild rice.

Lyford (1942:81) believes the early pre-contact yarn bags were probably made of spun buffalo wool/hair. When commercial yarns and woolen goods became common, these people substituted them for their native fibers. It is interesting to note that nettle fiber and basswood bark continued to be used as the warp.

Skin bags were also made by the Chippewa (Ojibwa) for many different purposes. Whole skins of the turtle, snake, mink, beaver and other small animals were used to make such items as Midé bags and pipe bags. Selected portions of skins from large animals were also used. Parfleche bags were used to some extent by Plains groups for storage, but were not made by the Woodland Ojibwa (Lyford 1942:102).

Skin containers appeared to have been more commonly employed among the boreal forest peoples than textile containers. Scant references are made to the manufacture of textile bags within this region Rogers (1967:37-39) describes in detail the variety of skin containers and their uses.

Skinner (1912:51) mentions that "netted" carrying bags were used to transport clothing and utensils among the Eastern Cree. Although the observed bags were made of commercial twine, he mentions that they were formerly constructed of twisted bark string. Honigmann (1956:30) states the Attawapiskat used "woven spruce root vessels" for cooking. He also notes the use of netted bags fashioned from willow bark line which were used to carry meat and other items. According to

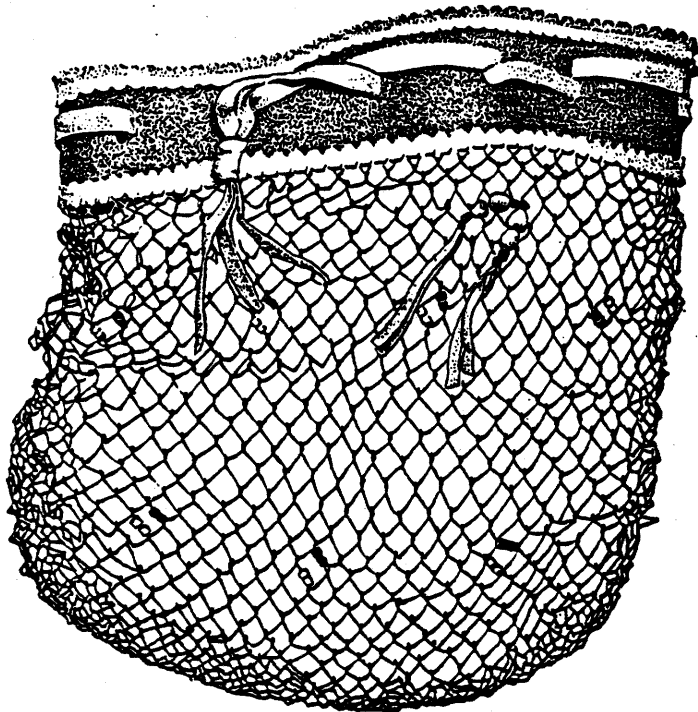
Honigmann, these containers correspond to the netted (looped) babiche bags employed by some Athapaskans (Figure 3.10a).

Strong, light, flexible, open bags of various sizes were characteristic of the Athapaskan peoples of the western Subarctic regions. The mesh was made of fine strips of babiche, worked in the same looping technique employed for the coats and blankets. These bags were used as hunting bags as well as for carrying and storing materials. The bags were occasionally decorated, and the looping sometimes had extra twists inserted to enhance the appearance of the bag (Figure 3.10b). The top of the bags were often finished with fine beads, silk ribbon and/or a band of quill weaving (Burnham 1981:4; Osgood 1970:71, 1971:74).

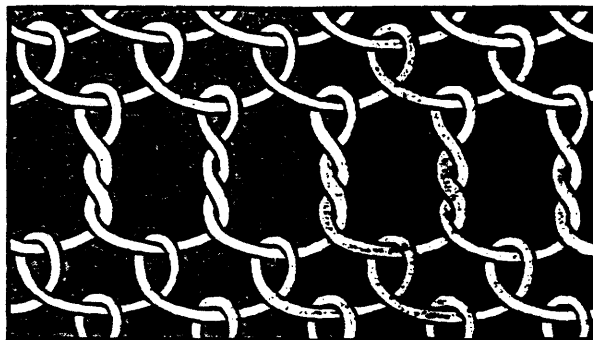
Baskets

Densmore (1929:162) noted that basketry was not a highly developed art among the Chippewa (Ojibwa), as a birch bark container answered the purpose of a general carrier and was made more easily than a basket. This is probably the case for the boreal forest region as well. Very few accounts refer to the construction or use of basketry beyond the Great Lakes area.

The Chippewa (Ojibwa) practiced wicker, plaiting and coiling techniques using willow branches, basswood bark, black ash (*Fraxinus nigra*), red ash (*Fraxinus* species), cedar root and sweet grass (*Hierochloe odorata*) in their basket making (Densmore 1929:162; Gilmore 1985:139; Lyford 1942:60-64; Smith 1932:419-420). The earliest forms of Chippewa (Ojibwa) baskets had covers and many were made with handles (Densmore 1929:162).



a. looped “netted” bag (from Osgood 1971:75)



b. looping technique with an extra twist (from Burnham 1981:4)

3.10. Looping technique employed to make bags.

Marles (1984:78,99) indicates that a form of basket made from willow twigs and another using sweet grass may have been manufactured among the Chipewyan of northern Saskatchewan. Although this information is based on the lexicon for these items, his sources had not seen the actual objects.

Osgood (1966:76, 1970a:67, 1970b:113,115) observed that spruce root baskets were employed by northern Athapaskan groups. He (1971:73) also notes the Han wove baskets from tamarack root and the Ingalik (1970:114-115) made grass baskets.

Mats

Woven mats appear to have been manufactured only by the southern Algonquian groups such as the Chippewa (Ojibwa) and the northern Athapaskan groups such as the Kutchin, the Han, and the Tanaina (Osgood:1966:77, 1970:67, 1971:66). Densmore (1929:154-157), Kinietz and Jones (1942:525-537), as well as Lyford (1942:88-95), detail mat making techniques of the Chippewa (Ojibwa). The southern peoples used bulrushes (*Scirpus validus vahl*), cedar bark, and cattail (*Typha latifolia*) reeds to construct their mats, whereas the northern peoples employed willow rods woven together and grass in order to make mats. These were generally constructed on a frame using the twining technique (Figure 3.11). Mats served several functions; they were suspended as inner doors, used as floor covers, were used to sit on, employed as sides for dwellings and a looser twined version served as a rack for drying berries (Densmore 1929:157, Osgood 1966:77).

Instead of woven mats, Rogers (1967:65) noted that small hides were used by the Mistassini to sit on. Moose head skins or several

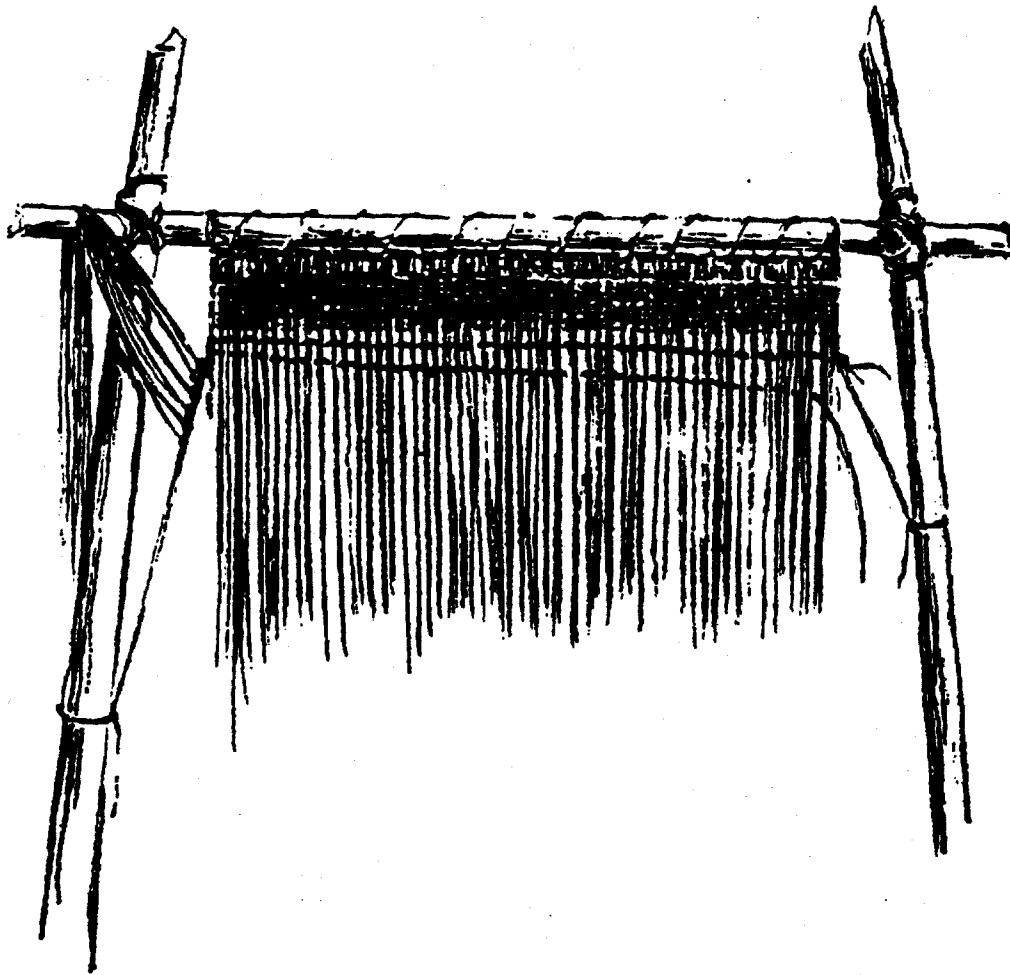


Figure 3.11. Unfinished twined mat on a simple frame (from Kinietz and Jones 1942:530).

caribou head skins were sewn together to make mats. These were commonly used during the winter moves when temporary camps were erected on the snow.

Nets

Densmore (1929:154) and Rogers (1967:79,85) describe in detail the construction of nets. Fish nets were employed by almost all peoples of the Subarctic region. Rogers (1967:79) notes that nets were also employed by the Mistassini for the capture of otter, beaver, and some birds. Nets varied in size depending on their function. If employed for hunting, they could be several feet long with meshes approximately three, or more, inches wide. Nets were used in the capture of ptarmigan, partridge, and possibly snow goose, as well as fish. The completed net for catching birds was about 10 feet wide and 12 feet long. Fishing nets varied in length but were generally about 100 feet long and several feet wide (Rogers 1967:79,85; Skinner 1912:27).

Once twine became commercially available, it was readily employed for net making. In earlier times, nets were made out of strong fibers of locally preferred materials such as nettle, willow root and spruce root. Osgood (1970:67) notes that the Kutchin prepared nets from babiche in which to catch muskrats and sometimes beaver. He argues that babiche nets were unsatisfactory because they rotted in water. He also notes they were not much good for fishing because the fish slipped too easily through the wet skin.

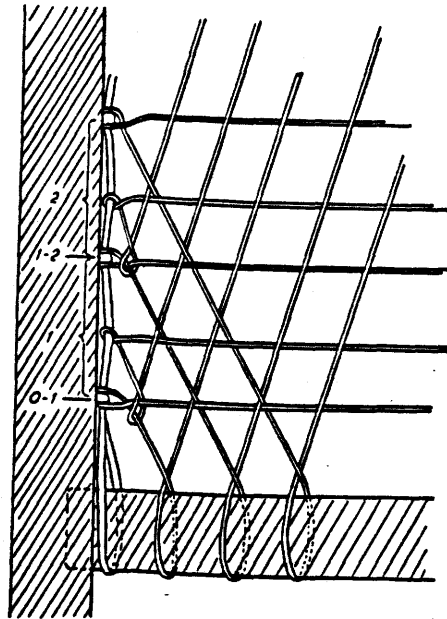
There is some question about the use of nets by northern Algonquian peoples. Although Skinner (1912:128,137) observed the use of nets for fishing among the northern Ojibwa, his informants argued

that they were not aboriginal, but European in their origin. Honigmann (1956:37) found his Attawapiskat informants were uncertain about the origin of fishing nets. He did note that the net shuttle used was European. Rogers and Taylor (1981:232) expand on this controversy by stating that in the late 1600s, the Hudson's Bay Company sent net makers to the bay to provide the local people with gill nets; however, even as late as about 1800, they did not make extensive use of the nets.

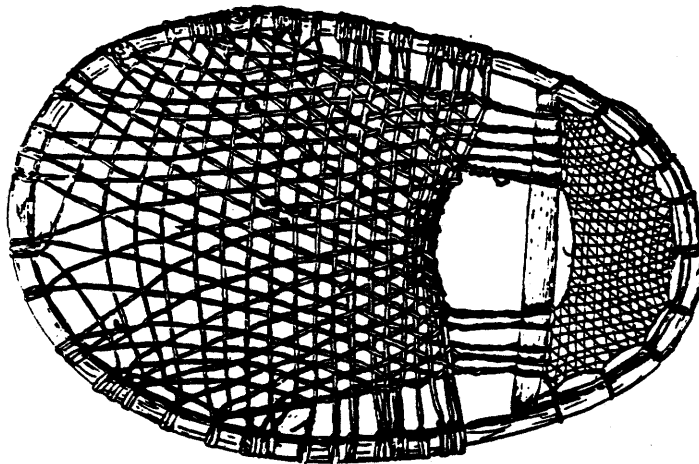
In contrast to the uncertainty of northern Ojibwa net fishing, Cleland's (1982:761-763) accounts indicate the importance of the inland shore net fishing of the northern Great Lake Ojibwa. The importance of the fishery was noted by the earliest European contacts with the upper Great Lakes people during the early seventeenth and eighteenth centuries (Cleland 1982:762).

Snow Shoes

Snow shoes were worn by all people of the boreal forest region. Netted snow shoes were of five styles; the elbow, bear-paw, swallow-tail, beaver-tail and pointed. Osgood (1940) and Rogers (1967) have provided detailed descriptions of these items. The frames for snow shoes were usually made out of birch, a wood that is light, tough and resilient. The babiche lacing was interwoven by working backwards, forwards and diagonally across the frame in a well defined sequence that made a hexagonal mesh. Each line passed over another line and under the following one in each of the three directions of the hexagonal pattern (Burnham 1981:5) (Figure 3.12). The babiche was woven when it was wet and then shrank upon drying, to produce "a strong and very firm fabric" (Burnham 1981:5).



a. interlacing used in making snow shoes (from Osgood 1970:78)



b. example of a snow shoe worn by the Eastern Cree (from Skinner 1912:45)

Figure 3.12. Snow shoe construction.

Sashes and Bands

The only documentation for the weaving of sashes and garters in this region is found among the Chippewa (Ojibwa) of the Great Lakes area. Densmore (1929:160-161) describes the process of "netting the belt." Lyford (1942:65-76) expands on this topic by describing other methods employed in the construction of the belts prior to the introduction of the commercially woven sashes. Techniques used included "braiding", "netting" and "finger weaving".

Spinners and Weavers

As in most hunting and gathering societies, a traditional division of labour and craft work by sex was maintained by boreal forest peoples. Women prepared skins and made clothing and dwelling covers, in addition to rawhide, bark and ceramic containers. It is generally believed they did all the weaving, quill work and snow shoe webbing. Men produced equipment for the hunt and for ceremonial activities. They carved bowls, spoons, snow shoe frames, paddles, pipes masks and cradle boards as well as constructed dwellings, canoes and toboggans (Brasser 1976:19). Through cooperative specialization, each family could produce what was necessary for its survival.

With regard to cordage production and some textile manufacture, the roles of the sexes was sometimes mixed. Women generally did all the weaving, but sometimes men assisted in producing lines. Osgood (1970:104,113-114) observed that the Ingalik men made the babiche line and also dug and prepared most of the spruce root line. He notes that the men used spruce root line more than women, but the women did better work with fine line than men. With regards to gender roles, women dug

and split the roots which they used for making baskets while the men dug the roots for canoes as well as for fish traps.

It is not known to what extent sex roles played a factor in determining who manufactured nets. Cleland (1982:763) states that although the Great Lakes Ojibwa women produced the fiber and manufactured the cordage, there is good evidence that men made the fish nets. Several nineteenth century notations are given in Cleland's article about observations made of men manufacturing the fishing nets. Rogers' (1967:85) observations of the Mistassini, however, indicate that women were the makers of fishing nets.

3.4 Summary

The analysis of textiles is a relatively young field. Although the first publications describing archaeological textiles appeared in the 1800s, it was not until the 1970s that analysis became more formalized. Data collection, recording techniques and presentation of data became more standardized and comprehensive. Textile studies no longer consisted of merely descriptive and illustrative interpretations of analyzed textiles or textile-related artifacts. Current studies employ attribute analysis to identify textile production costs and possible uses for fabrics.

Most information obtained for the analysis of textiles and textile-related artifacts is derived from ethnographic and/or archaeological findings. Given that there are no detailed accounts of a textile industry specific to the study regions, inferences must be made based on the knowledge of surrounding cultural groups. Rogers (1967:1) writes that

material culture of any people with a particular technology and subsistence pattern reflects the environment in which they live. By studying the material cultures of similar neighbouring groups, it is possible to illustrate the potential textile technology of the study regions.

CHAPTER FOUR

4.0 THE SELKIRK COMPOSITE

4.1 Introduction

The Selkirk composite is a widespread archaeological manifestation which is present in the boreal forest regions of northwestern Ontario, Manitoba and Saskatchewan and is assigned the Late Woodland period (Figure 4.1). First defined by MacNeish (1958), Selkirk taxonomy has since been reassessed and expanded upon to incorporate regional variations and possible boundaries. Aspects of this composite have been detailed by many writers such as Hlady (1970, 1971), Meyer (1978a, 1978b, 1981, 1984), Meyer and Russell (1987) and Syms (1977). For brevity, this chapter will therefore provide a concise overview of the Selkirk composite, with attention to its current interpretation. In order to better understand the chosen study regions and their relationship to each other, as well as to the rest of the composite, a description of the complexes and their pottery will be provided. Finally, discussions regarding Selkirk origins and the possible ethnic identity of the pottery makers will be presented.

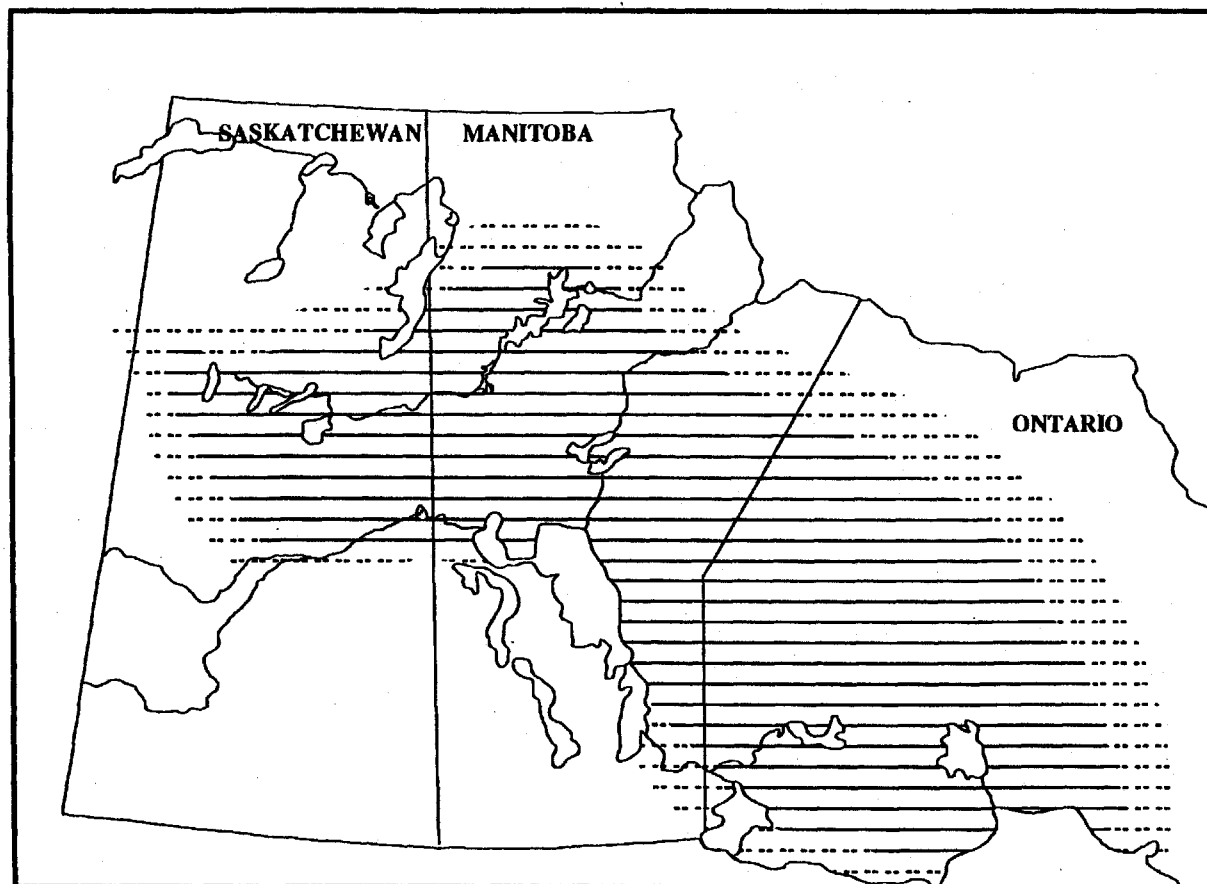


Figure 4.1. Map showing distribution of Selkirk Composite. Map adapted from Meyer and Hamilton (1994:124) in collaboration with Scott Hamilton.

4.2 The Selkirk Composite: An Overview

MacNeish (1958) defined the Selkirk "focus" as a result of archaeological surveys and excavations in southeastern Manitoba during the summers of 1951, 1952 and 1953. MacNeish defined this focus on the basis of small, side-notched and triangular projectile points and globular pottery vessels. The pottery was characterized by constricted necks and, usually, excurvate rims, as well as a smoothed textile-impressed exterior finish.

In the mid 1950s, MacNeish also identified the Late Woodland pottery of northern Manitoba and Saskatchewan as Selkirk (Meyer and Russell 1987:3). Subsequently, through the examination of several sites in northern Manitoba, Hlady (1970, 1971) realized the pottery from this area differed from the Selkirk pottery of southeastern Manitoba. Hlady assigned the northern pottery to the Clearwater Lake phase to distinguish it from that described for the south. Hlady (1971:22) also introduced his definition of the Clearwater Lake Punctate type to describe much of the the northern Selkirk-related materials.

By the mid 1970s, therefore, the classificatory scheme originated by MacNeish began to be questioned. Archaeologists were becoming aware of assemblages which were clearly Selkirk-related, but did not exactly fit with existing descriptions. In an attempt to clarify the Selkirk situation, Gary Dickson organized a symposium on the topic at the 1977 annual meeting of the Association of Manitoba Archaeologists. Papers were presented on Selkirk-related materials in Manitoba, Saskatchewan, and Ontario. Presentations included an introduction to fabric impressions (Saylor 1978:49-54), cluster analysis of Southern Indian Lake pottery

(Kelly 1978:65-72), a Saskatchewan perspective on the Clearwater Lake phase (Meyer 1978:27-42) and an overview of Selkirk ceramics recovered from the Lake of the Woods (Rajnovich et al. 1978:43-48). Discussions led to some consensus and a baseline of then-current knowledge about Selkirk was established (Meyer and Russell 1987:20).

Subsequently, Selkirk taxonomy has been influenced by the scheme which Syms (1977:5-8) introduced for organizing the late pre-contact materials from the northeastern plains. His concepts of the complex and the composite have been especially important. Syms (1977:70-71) definition of a complex is:

the total expression of a number of assemblages left by the same group over a sufficiently narrow time period that the cultural expressions undergo only minor changes. A complex has both cultural and historical validity. It represents the remains of a group with a shared lifestyle, the same overall tool kit, the same technological skills and preferences, and the same typological and technological attributes.

These regional complexes may in turn be grouped into a geographically more extensive "composite". Syms (1977:71) defines a composite as consisting of:

a number of complexes which share a set of traits, both technological and stylistic, that may be conceived as being sufficiently similar to indicate a common and recent ancestry but sufficiently different that micro evolutionary changes have taken place.

Meyer (1981:27) felt that various regional Selkirk complexes could be established. These regional expressions all share similar non-

ceramic tool assemblages as well as Selkirk ware pottery. Sufficient variation is present in the ceramic styles, however, to prompt the recognition of regional complexes. In 1987, Meyer and Russell published an overview of Selkirk, recognizing five regional complexes comprising a larger Selkirk composite.

Subsequently, in their review of the Late Woodland taxonomy, Lenius and Olinyk (1990:77-103) proposed that two composites be introduced: Selkirk, for the northern materials and Rainy River, for the southern materials originally described by MacNeish. The main difference in the ceramics of these two composites is that Selkirk composite ceramics exclusively use the punctate design element on the vessel exterior, while oblique and horizontal designs are absent. The Rainy River composite pottery, however, almost always excludes the use of punctates and is characterized by oblique or horizontal design elements on the vessel exterior or by undecorated vessels.

Those complexes which are now recognized as composing the Selkirk composite include Clearwater Lake, Kame Hills, Pehonan, Kisis and, perhaps, Grass River (Figure 4.2). These complexes represent the extent of current archaeological knowledge. It is possible that a number of other regional Selkirk occurrences may eventually be described as distinct complexes (Meyer and Russell 1987:4,20,21).

4.2.1 Selkirk Complexes

4.2.1.1 Clearwater Lake Complex

The Clearwater Lake "phase" was originally defined by Hlady (1971) to describe pottery assemblages found in northern Manitoba. Meyer (1981:27) introduced the term "complex" in order to define

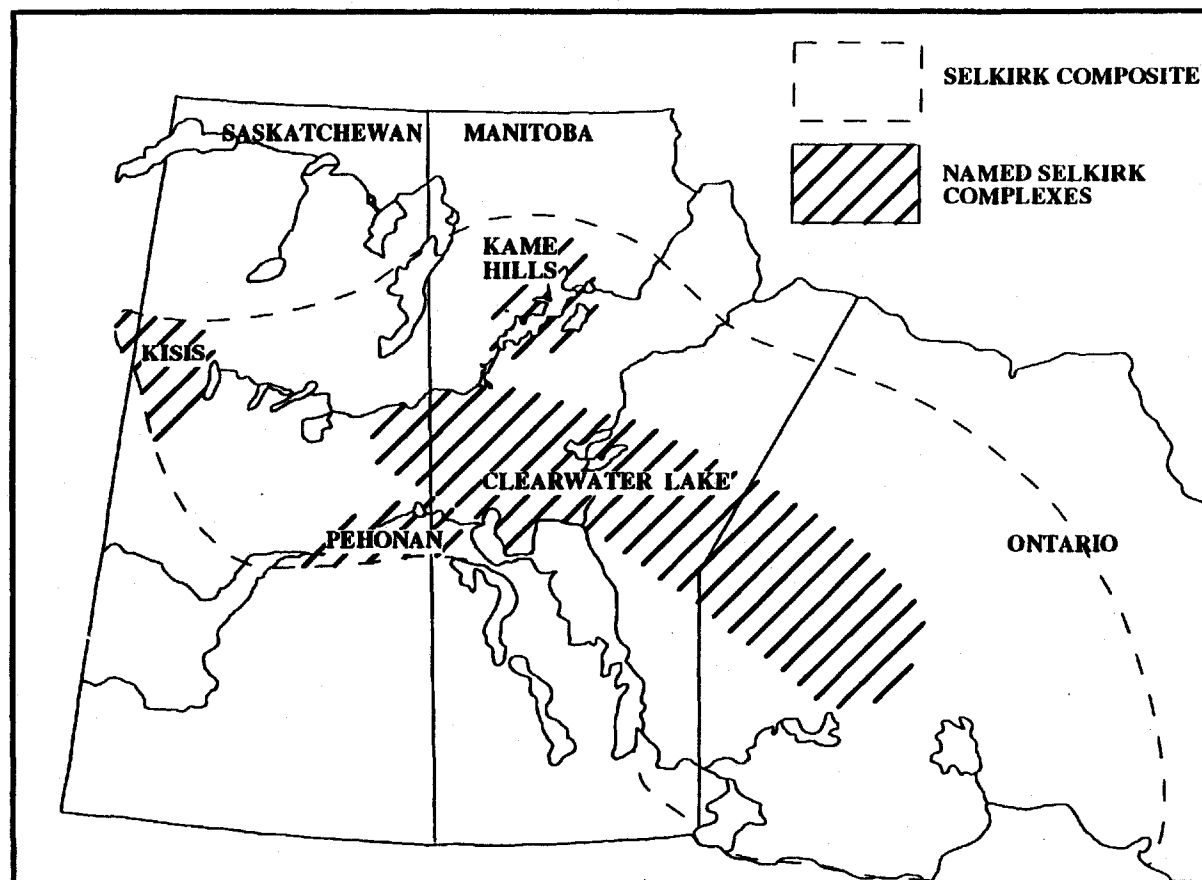


Figure 4.2. Map showing location of the complexes which make up the Selkirk Composite. Adapted from Meyer and Russell (1987: 5).

territorial distinction for this regional variant of the Selkirk composite. Clearwater Lake Punctate type pottery is characteristic of the Clearwater Lake complex. This complex is known to extend across the boreal forests of northern Manitoba and Saskatchewan and into adjacent Ontario. The type site for this complex is located on the lake of the same name, located 17 kilometres north of The Pas, Manitoba. The lake is only 38 kilometres from the Saskatchewan-Manitoba boundary (Hlady 1971:21; Meyer 1978a:29).

Clearwater Lake Punctate type pottery is relatively homogeneous. Vessels are often globular with constricted necks and slightly excurvate rims (Figure 4.3). The most distinctive characteristic of this pottery is the presence of a single row of punctates that encircles the neck exterior. The punctates are almost always round although oblong ones sometimes occur. Interior bosses are formed by this process. The lips are usually flat and the flat surface, or the lip corners, may be decorated in a variety of ways -- by cord-wrapped tool impressions, incisions and punctates (Meyer 1978a:32, 1981:27). The ware is thin, varying from under 5 mm to 10 mm in thickness. Temper consists of crushed granite and is sometimes quite coarse. Sherds reveal a laminated appearance and frequently break into layers. The exterior surfaces of all Clearwater Lake Punctate pottery are textile-impressed. These impressions were normally smoothed before the clay was completely dry (Meyer 1981:27). The degree of smoothing was highly variable. Some vessels exhibit portions of a textile structure while other vessels have almost completely obliterated textile-impressions where the impression are smoothed to the point of little recognition.

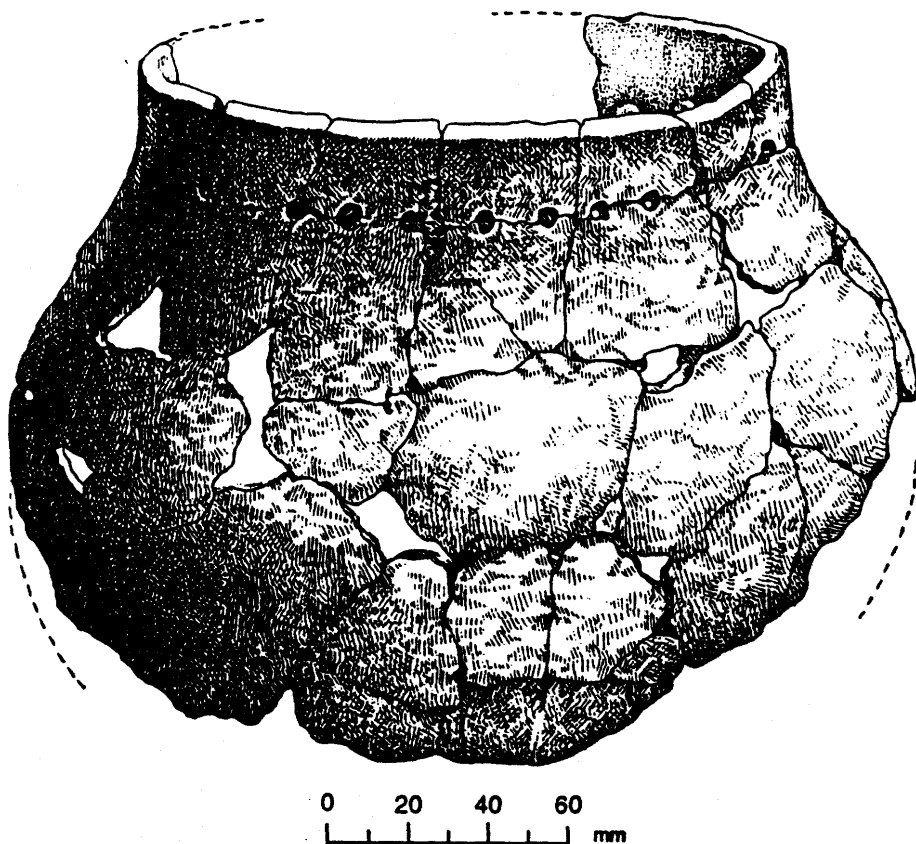


Figure 4.3. Clearwater Lake Punctate Type-pottery from northern Saskatchewan. (Drawing by Phyllis Lodoen, from Meyer 1993:62, courtesy of the Saskatchewan Archaeological Society.)

Clearwater Lake Punctate pottery has been recovered from almost all Selkirk sites. The most northerly known occurrence of Clearwater Lake Punctate pottery in Saskatchewan is at Black Lake (Minni 1975:57). The most southerly occurrences of Clearwater Lake Punctate type pottery in Saskatchewan appears to be in the Nipawin area; however, they are not as numerous as the non-Clearwater Lake Punctate recoveries which reflect southern contacts (Meyer 1978a:31, 1978b:7-8, 1993:64-65; Meyer and Epp 1987:336; Meyer and Hamilton 1994:123,125).

The easternmost extent of Clearwater Lake in northern Ontario is not well known, although Clearwater Lake assemblages have been described as far east as the Albany River (Meyer and Russell 1987:12). Although ceramics have been recovered from the Hudson Bay Lowlands, these finds have been small and fragmentary. The territorial extent clearly is reflecting the extent of archaeological knowledge (Hamilton, personal communication 1994). Meyer and Russell (1987:12) postulate that Clearwater Lake occurrences in northern Ontario may eventually be recognized as composing a distinct complex within Selkirk. Hamilton (personal communication 1994) agrees, citing evidence of pottery that exhibits mixed traits between Selkirk and Blackduck.

A primary characteristic of Clearwater Lake assemblages is the limited range of lithic raw materials. The predominant use of quartz in some components is evidence of this (Hlady 1971:25; Meyer 1993:63). Projectile points are usually small and triangular, the majority being side-notched points (Figure 4.4). Also characteristic are endscrapers,

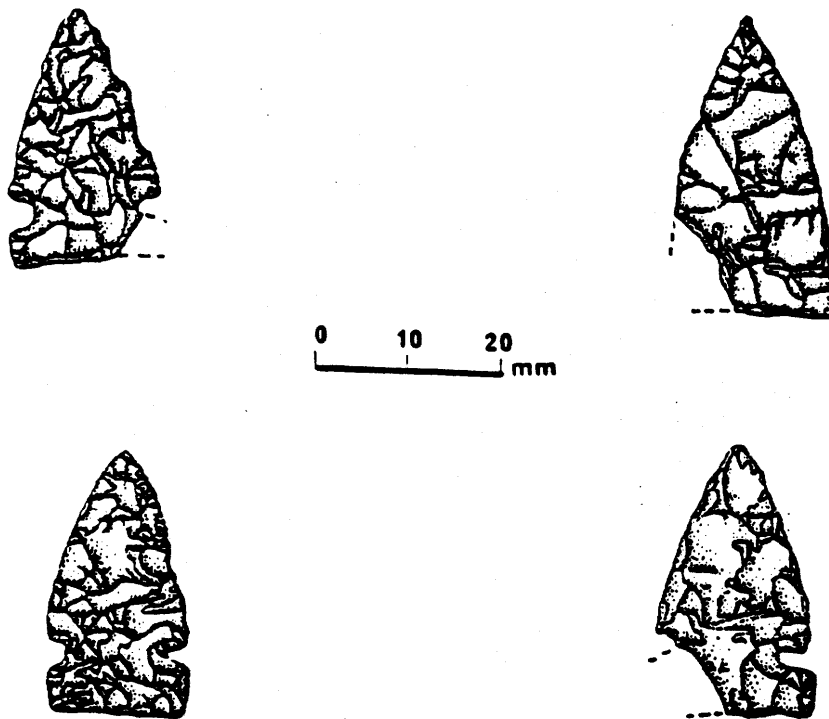


Figure 4.4. Projectile points associated with Selkirk composite.
 (Drawing by Phyllis Lodoen, from Meyer 1993:63, courtesy of the
 Saskatchewan Archaeological Society.)

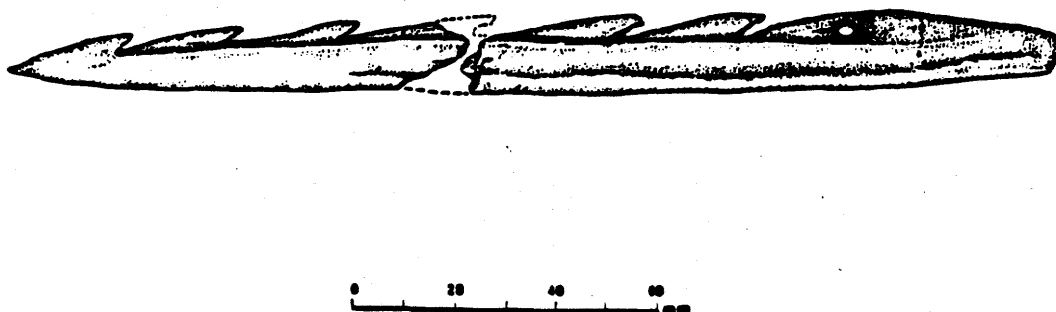


Figure 4.5. Bone harpoon point. (Drawing by Phyllis Lodoen, from
 Meyer 1993:63, courtesy of the Saskatchewan Archaeological Society.)

sidescrapers and spokeshaves as well as biface knives. Ground celts, adze blades, net sinkers, slate abraders, hammerstones and chipping hammers are present. Bone or antler tools are well represented and there is quite a variety--barbed harpoon points (Figure 4.5), awls, fleshers, snow shoe needles, antler flakers, hideworking tools, bone tubes, arrow shaft straighteners, beads, pendants, canine teeth showing work for attaching and moose jaw scraper or snow knife (Hlady 1970:114, 1971:24; Meyer 1993:63; Meyer and Russell 1987:11). Red ochre has been found in Clearwater Lake sites as raw pigment, as well as encrusted on the interior surfaces of a few pot sherds (Hlady 1971:25).

Dates are problematic for Selkirk complexes. In particular, the boreal forest site deposits are very shallow, generally lacking stratigraphic separation of successive occupations. As well, the soils are acidic, resulting in rapid decomposition of bone and antler, with the result that these materials are not consistently available for radiocarbon dating. While charcoal is present, the repeated passage of forest fires makes this material suspect for dating purposes (Meyer and Russell 1987:4). Clearwater Lake complex dates are not numerous; however, existing calibrated dates indicate that Clearwater Lake begins as early as the A.D. 1300s and extends into the A.D. 1600s (Meyer and Russell 1987:12).

4.2.1.2 Kame Hills Complex

This complex was defined on the basis of a large-scale archaeological project in the Kame Hills region of Southern Indian Lake between 1968 and 1975. Twelve sites were revealed. The largest and most intensively investigated was the multi-component Kame Hills site.

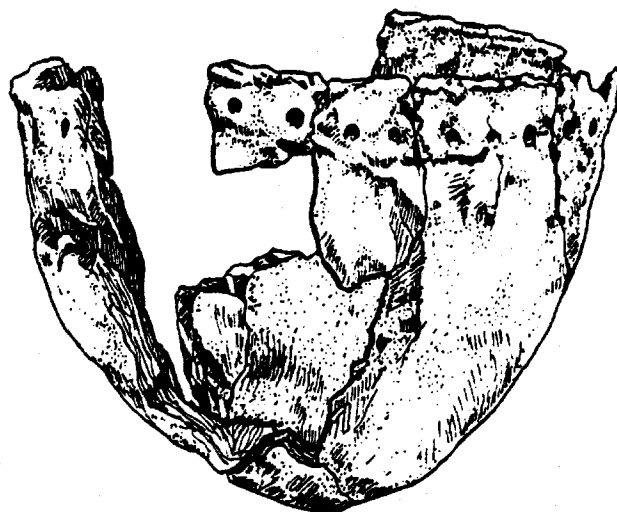
Although Shield Archaic, Laurel, Taltheilei and Blackduck materials were present, the major occupation was Selkirk. Of 132 vessels identified, 129 were classified as Selkirk (Dickson 1980:43, 1983:5,39; Meyer and Russell 1987:12).

Dickson (1980:150-151) found that the artifacts recovered from the Kame Hills locality were closely related to the Clearwater Lake material; however, they were distinct enough to establish a new complex. The pottery shared similar paste and temper characteristics. A few vessels appeared to have sand or organic material as temper. Temper was present in small to moderate quantities and was often visible on the surface of the sherds. The paste was very blocky and very laminated. Exfoliation was common. Dickson (1980:57,1983:39) believes that the method of manufacture included both the paddle-and-anvil technique and fabrication in and around fabric molds. He suggests that smaller vessels were usually modeled from lumps of clay (Dickson 1983:39).

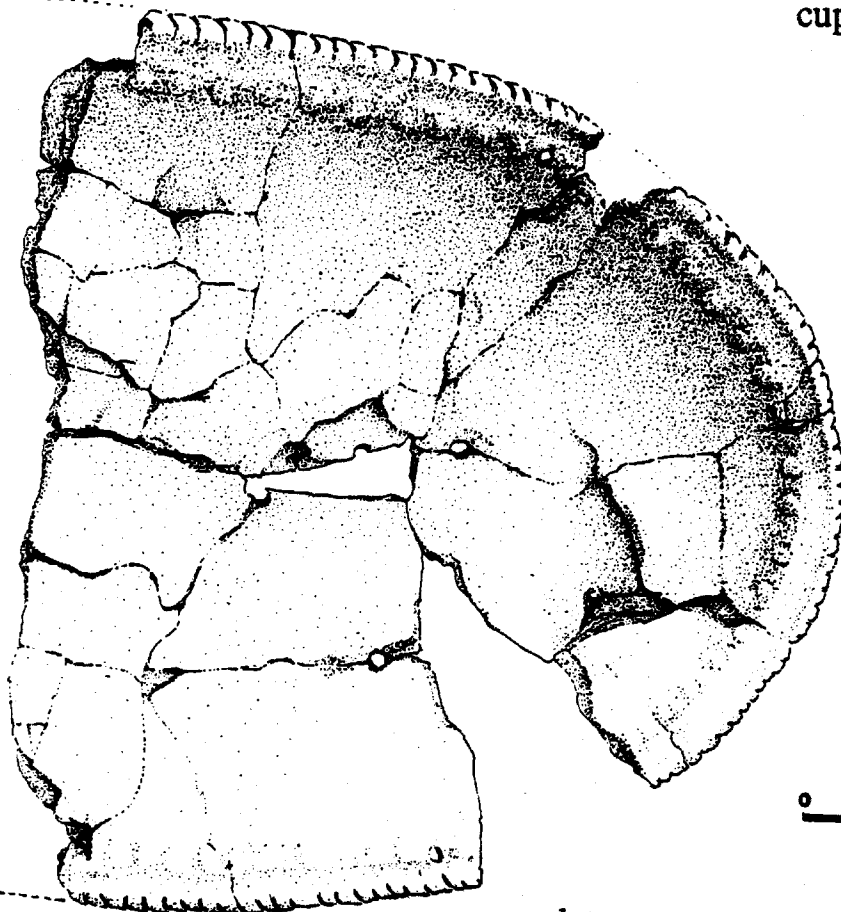
The ceramics, however, were distinctive in the variety of vessel forms represented and in the combination of attributes. Four vessel forms were identified - pots, plates, bowls and cups (Figure 4.6). In addition, a special bowl form, a pipe bowl was noted (Dickson 1980:43, 1983:40,48). Although plates are numerous, pots outnumber them at all sites except at the Kame Hills site where there are 63 plates and 54 pots (Dickson 1983:46). It should be noted the true nature of the "plate" forms is not known. It is believed they served as food platters; however, they could also have been used as lamps. Residue analysis of carbon remains adhering to the vessels has revealed fish oil. Since fish oil was



pipe bowl (natural size)



cup (natural size)



plate

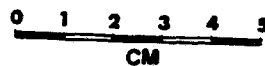


Figure 4.6. Vessel forms found in Kame Hills assemblages (from Dickson 1980:46,49,61, courtesy of MHRB).

widely utilized, this information does little to clarify the nature of these vessels (Mary Ann Tisdale, personal communication 1994).

A few reconstructed vessels indicate that there are several sizes of each type of vessel. For instance, pots vary from one with a capacity of 0.7 L to one with a capacity of 10.7 L. The maximum depth (inside), diameter (inside) and orifice diameter (inside), respectively, for these vessels were 9.9 cm x 11.6 cm x 10.6 cm. and 24.2 cm x 30.0 cm x 21.8 cm (Dickson 1983:421).

Kame Hills vessels differ from those of the Clearwater Lake complex in other ways as well. Multiple rows of exterior punctates are quite common (Figure 4.7) and textile impressions often extend over the lip into the interior of the vessel. Although decoration includes cord impressions, cord-wrapped tool impressions, incising and punctates, several Kame Hill vessels had impressions made on the lip with a stripped black spruce (*Picea mariana*) twig. This produced a distinct impression which was named "piceated" (Dickson 1980:60, 1983:44,46).

The tool assemblage of the Kame Hills complex is similar to other Selkirk assemblages, although chithos and wedges may also have been a part of the tool kit (Dickson 1980:150). Bone tools are not common. Dickson believed this paucity of bone tools helped define the Kame Hills complex; however, Meyer and Russell (1987:15) noted that organic artifacts should not be expected to preserve well in the acidic soils of the boreal forest. The presence of chithos, a type of scraping tool, may indicate interaction with northern groups. Meyer (1993:60-61) indicates that these tools are distinctive to the material culture of northern Athapaskan peoples.

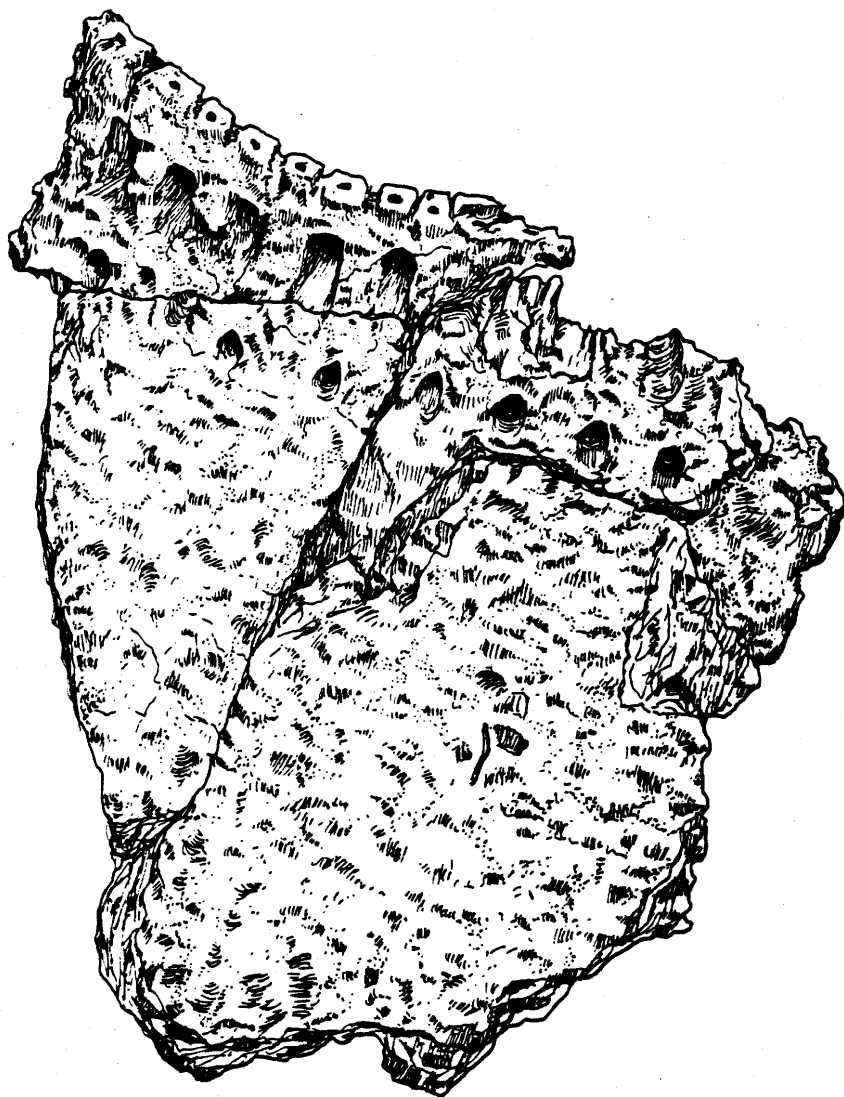


Figure 4.7. Kame Hills vessel (natural size) exhibiting multiple rows of punctates (from Dickson 1980:62, courtesy of MHRB).

Geographically, the Kame Hills complex is concentrated on and around Southern Indian Lake. The extent of its distribution is presently unknown. The above project, called the Churchill Diversion Archaeological Project, was motivated by emergency heritage resource rescue considerations. Since the completion of this project archaeological research in northern Manitoba has been sporadic (Kroker 1990:40). Kroker (1990), however, provides a summary of archaeological investigations which have been conducted in this region. Since 1990, Riddle (1994) has re-investigated the same region as the earlier project. The results of his survey indicate previously unknown sites which contain sizable and significant inventories of archaeological materials (Riddle 1994:1).

Dickson (1980:150) considers the Kame Hills complex to have begun as early as A.D. 850 and ended at about A.D. 1750. Upon reviewing the dates, Meyer and Russell (1987:15) believe it is possible that this complex began as early as the A.D. 1000s, however the majority (10) of the Kame Hills complex dates have calibrated ranges beginning in the A.D. 1200s and later.

4.2.1.3 Pehonan Complex

The Pehonan complex was introduced by Meyer (1981) to describe pottery recovered in the course of archaeological reconnaissance in the Saskatchewan River valley near Nipawin during 1976. It was apparent that some aspects of these assemblages were different from Clearwater Lake Punctate pottery. The most obvious were vessels which exhibited angular shoulders and decorated shoulders (Meyer 1981:24). Meyer (1984:43) noted three styles of pottery at

Pehonan sites: (1) Clearwater Lake Punctate, which is no different than that described by Hlady (1971), (2) Francois Punctate, originally described by Alice Kehoe (1964), as having decorated lips, punctates around the neck and decorated or very angular shoulders, and (3) Nipawin Horizontal, which is characterized by horizontal lines of cord-wrapped tool impressions extending from the lip to the shoulder.

Between 1981 and 1985, large-scale archaeological surveys and excavations were conducted in the Nipawin region as a result of a proposed hydroelectric project. On the basis of recoveries from six sites which contained Pehonan components, Meyer (1984:43) reassessed the Pehonan complex. Very little Nipawin Horizontal had been recovered. Its presence, Meyer felt, was due to trade, southern contacts or the incorporation of "foreign" women into Nipawin groups and so he rejected it as an integral part of the Pehonan complex. In fact, the pottery from the southernmost Selkirk sites of the Saskatchewan River valley exhibits a number of features that appear to reflect influence from cultural groups on the parklands and grasslands (Meyer 1981:3, 1993:64-65; Meyer and Hamilton 1994:123). Therefore, despite abandonment of the Nipawin Horizontal type, Meyer (1984:43) continued to consider the Pehonan complex a valid construct. He noted that it is represented by pottery which contain features not characteristic of Clearwater Lake. These include the presence of decorated shoulders, angular shoulders, slightly incurvate or externally thickened rims and the significant frequency of interior punctates. This latter feature is rare to absent in Clearwater Lake assemblages (Meyer 1984:43; Meyer and Russell 1987:16-17).

Despite thorough investigations of Pehonan components in the course of the 1981 to 1985 Nipawin project, little was added to the known inventory of Selkirk lithic and bone artifacts. Adze blades of hard shale were common. Bone and antler artifacts include unilaterally and bilaterally barbed harpoon heads, side-notched arrowheads (very rare), awls, possible gorges and button-like objects (Meyer and Russell 1987:17; Quigg 1983:172-174). Red ochre was also present. A small pendant made of local clam shell was recovered from the largest site, Bushfield West. Trade items were also represented in the assemblages. These included dentalium, Knife River flint debitage, obsidian flakes and the rare presence of check-stamped sherds. A small fragment of iron and an equally small fragment of sheet copper were also recovered from the Bushfield West site. It is very likely these items arrived in the Nipawin area in the A.D. 1600s through native trading networks (Meyer and Russell 1987:17,19).

Geographically, Meyer and Russell (1987:17) suggested that Pehonan components occur throughout the southern fringe of the forests of central Saskatchewan and into the parkland. Meyer and Hamilton (1994:125) more recently state, however, that although Pehonan is very well represented in the boreal forest, right to the edge of the parklands, expansion out of the forest was very limited. They do note that given its general restriction to the forest, Selkirk had considerable influence on adjacent northern Plains cultures.

Dates for the Pehonan complex are generally later than those previously described for the Kame Hills complex. The earliest possible date is in the A.D. 1200s; however, Meyer and Russell (1987:17)

estimate the beginning dates are more likely in the mid to late A.D. 1300s. The Pehonan complex appears to date through to about A.D. 1700, although none of the Pehonan sites in the Nipawin region can be considered contemporaneous with the fur trade period (post A.D. 1700) (Meyer and Russell 1987:17).

4.2.1.4 Kisis Complex

The Kisis complex is the furthest west representative of the Selkirk composite, extending as far as the Saskatchewan-Alberta border, and potentially the latest expansion (Paquin 1994: abstract). First proposed by Millar (1983:96), the Kisis complex was originally based on materials recovered from three sites on the Kisis Channel in the Buffalo Narrows area of northwestern Saskatchewan. Millar (1983:104) did not distinguish the pottery from the Clearwater Lake Punctate type, although he did note a difference in the lithic assemblage.

Millar (1983:103) did not recover any side-notched points in his investigations. Bone tools, however, were well represented. Several exotic materials were recovered, all in a very small number, but were indicative of trade or mobility. These materials included Knife River flint, Beaver River quartzite, petrified wood and a single specimen of Swan River "silicified limestone" (Millar 1983:104) - presumably Swan River chert. A fragment from a white clay pipe bowl and two small fragments of iron indicated access to some European goods. Other than these three trade items, the assemblage appears to be typical of the Selkirk Composite. There were no musket balls, beads, kettles, etc. that were common during even the earliest period of European contact (Millar 1983:104).

A larger surface collection of pottery from the outlet of McCuster Lake was described by Smith (1984). Of the seven vessels represented in this collection, six portray Selkirk characteristics. Smith originally assigned this pottery to the Francois Punctate type of the Pehonan complex. Although similar, it has distinct features which are absent in Pehonan. One vessel has an abrupt angular shoulder (Figure 4.8). The exterior of this vessel also has crushed temper pressed into the exterior surface of the vessel while the pot was still damp (Smith 1984:30). The shoulder of another vessel is decorated with a complex set of pinches, cord-wrapped tool impressions, and punctates (see Paquin's reassessment below). An isolated shoulder sherd, unassignable to vessel, bears a similar decoration of pinching with punctates and incising (Meyer and Russell 1987:19).

In 1983 and 1984 Virginia Scanlon, a student of Dr. Millar, conducted excavations at the Ice House site which was one of the sites identified in Millar's study. This site produced considerable amounts of pottery, lithics and faunal remains. While the material has not been reported, Meyer and Russell (1987:19) indicate it is similar to that from McCuster Lake.

A graduate student from the University of Saskatchewan, Todd Paquin, is currently analyzing the pottery recovered from these previous studies, in addition to ceramics excavated in 1991. A total of 60 vessels are represented. Paquin acknowledges that Millar, Smith and Scanlon were correct to some degree in their assessment of the ceramics from the Kisis region. He notes, however, that they had only worked with limited



Figure 4.8. Kisis vessel from McCusker Lake. (Courtesy of Todd Paquin).

amounts of ceramic materials, without having the opportunity to examine each other's collections (Paquin 1994:4).

Upon examination, the majority of the vessels studied fall within the technology generally identified as Selkirk. They exhibit smoothed textile-impressions on their exterior surface which may carry over to the lip surface, a globular body shape, with subtle to prominent shoulders, a constricted neck, and vertical to excurvate rims. A single row of punctates is often impressed around the neck or rim circumference. The vessel walls are generally thin, often laminated with a tendency for exfoliation, and tempered with moderate amounts of coarse crushed grit (Paquin 1994:4).

Paquin (1994:6-7) found some discrepancies between the original definition of Kisis complex ceramics and the results produced through vessel reconstructions. It was noted by Smith (1984) and Scanlon that several pot sherds exhibited decorated angular shoulders. After reconstructing several profiles which included these decorated sherds, it became apparent that they were actually decorated rim angles, not shoulders. It is the rim angles which are now considered diagnostic for the Kisis complex type pottery. Kisis vessels usually have a decorated lip consisting most often of cord-wrapped tool impressions made on the outer lip corner or alternating on the inner and outer lip corners. The rim, itself, is convex to straight in curvature, leading to the rim angle. The angle inflects quite sharply, with the point of maximum neck constriction found immediately beneath the angle. The lower neck and upper shoulder region appear to be quite long with a gentle change in curvature, leading into a prominent round shoulder. The examined rim

angles are decorated with a single row of fingernail pinches, which may either alternate with oval punctates or be immediately above a row of oval punctates (Paquin 1994:6).

Paquin (1994:7) notes there are three known vessels which incorporate crushed grit temper as a decorative element within the technology. He questions whether this is diagnostic of the Kisis complex or the idiosyncratic work of one potter. It could be noted that this decorative practice has also been observed on pottery from the Southern Indian Lake region.

The Kisis complex is not yet well known. It is considered to date to the late prehistoric/protohistoric periods in the western forests of Saskatchewan. This could be considered the period from about A.D. 1600 to 1750.

4.2.1.5 Grass River

Hlady (1971:28-29) recognized a second Selkirk-related phase as a result of pottery recovered in the Grass River region of northern Manitoba. He described the Grass River Fabric-impressed "ware" associated with this phase as being essentially the same as that of Clearwater Lake, but was characterized by vessels exhibiting prominent ribbed textile-impressed exteriors (Hlady 1971:22; Meyer and Russell 1987:3). In short, the vessel exteriors were never smoothed. Hlady (1971:18) noted that the tools associated with the Grass River phase did not differ from those of Clearwater Lake.

Meyer (1978b:9) and Dickson (1980:52-53) have been skeptical of the existence of the Grass River "phase" and its accompanying pottery. The pottery appears to be Selkirk ware in all respects. Only the

surface finish is different. To be recognized as a Selkirk manifestation, separate from Clearwater Lake, other distinctive ceramic attributes must be described (Meyer and Russell 1987:12). However, Meyer and Russell (1987:12) also suggest that while the concept of a Grass River ware has no logical basis and must be rejected, the concept of a Grass River "phase" should be reconsidered. There may be a distinctive Selkirk complex in the boreal forests of northeastern Manitoba and adjacent Ontario. The hallmark of the Grass River complex, therefore, would be the presence of a high frequency of Grass River style impressed vessels.

4.3 Selkirk Origins

Meyer and Russell (1987:21) state that if the origins of Selkirk were known, then we would understand its various archaeological manifestations much more completely. At the time, they identified two proposals relating to the origins of Selkirk. One proposal involves the in-movement of Selkirk from elsewhere while the second treats Selkirk as the product of an indigenous development.

The in-movement model was introduced by MacNeish (1958:79) in reference to the Selkirk of southeastern Manitoba. MacNeish argued that although Selkirk shared many traits with the preceding Blackduck, it did not develop out of that culture. Instead, MacNeish proposed that this group moved in from the north or northeast (MacNeish 1958:79; Meyer and Russell 1987:21-22).

Meyer and Russell (1987:21) believe Wright (1968) may have been the first to introduce the idea of an indigenous development of Selkirk. Although others adopted this theory, Rajnovich (1983) provides

the most serious consideration of Selkirk origins, presenting several hypotheses relating to the origin of Selkirk. She believes it to be an indigenous development, where Selkirk evolved out of Laurel in northern Manitoba. It then expanded west, south and east. She also postulates that Clearwater Lake Punctate type pottery was the earliest form of the Selkirk ceramic technology and that the other types evolved from it (Rajnovich 1983:58).

In the period around A.D. 1000, there were two major cultural groups in central-northern Manitoba -- Late Laurel and Blackduck. Meyer and Russell (1987:24-25) believe it is very likely that the Late Laurel peoples composed the population which produced Selkirk pottery. However, there was almost certainly a strong cultural influence exerted by the Blackduck peoples. This is evident in the non-ceramic assemblage characterized by thin side-notched and triangular flake points and small adze blades. The ceramics also share many features. The globular vessel form was adopted, as was the exterior textile impression, although it was done with a new kind of fabric (Meyer and Russell 1987:24-25).

Meyer (1993:57) states that sites with distinctive Selkirk pottery are found throughout the same area as the preceding Laurel, but many of the sites are much larger. By A.D. 1250, peoples making Selkirk pottery are thought to have occupied an area extending from the Churchill River in northern Manitoba southeastward into northwestern Ontario.

Although there are not a large number of Selkirk dates, Selkirk does appear to be earliest in north-central Manitoba where it dates from at least A.D. 1100 (Meyer and Hamilton 1994:119; Meyer and Russell

1987:13,15). As mentioned previously, Selkirk assemblages in neighboring regions have produced later dates. It seems that between A.D. 1250 and A.D. 1500, Selkirk expanded to the west, east and southeast out of northern Manitoba. For instance, Selkirk sites in the Nipawin area of eastern Saskatchewan date no earlier than the late A.D. 1300s (Meyer and Russell 1987:17). Similar dates have been obtained for Selkirk assemblages in southeastern Manitoba and in adjacent Ontario (Meyer and Hamilton 1994:119,122; Rajnovich 1983:54). By A.D. 1500, Selkirk had become well established on the Churchill River system in Saskatchewan. Although the pottery of the latter system is very similar to that of adjacent northern Manitoba, some Saskatchewan River vessels exhibit a number of features that appear to reflect influence from cultural groups on the parklands and grasslands (Meyer and Epp 1990:336-337; Meyer and Hamilton 1994:123). In southern Manitoba at this time, Syms (1977:140) has also documented the presence of features in the regional pottery that are considered to reflect forest influences (Meyer and Hamilton 1994:125).

4.4 Ethnic Affiliations

It cannot always be assumed that a particular cultural group can be associated with archaeological manifestations. However considering the distribution of groups at the time of contact, it seems very likely that Selkirk is the product of northern Algonquians, including those who became known as Crees in the historic period. The Selkirk culture has long been considered of Cree origin (Gibson 1993:95-112; MacNeish 1958:47-49; Meyer 1987:187-196, 1993:69; Meyer and Hamilton

1994:127; Meyer and Russell 1987:25-26; Syms 1977:108; Wright 1971:20-24). Meyer (1993:69) notes that there are no other ethnic groups that would be likely candidates, although it is possible that some of the woodland (northern) Assiniboine who were closely allied with the Cree may have adopted the same material culture

4.5 Summary

Pottery of the Selkirk composite has been studied since the 1950s. Through comparative and regional analysis and with more in-depth research, we are gaining insights into its diversity and geographical distribution. Although the Selkirk composite is characterized by vessels with one row of punctates around the circumference of the neck, several regional variants have been recognized in the form of complexes. These complexes extend from the boreal forests of Manitoba into Saskatchewan and northeastern Ontario.

It is believed that the makers of Selkirk pottery originated in the central forests of Manitoba and expanded outward from there. It is highly probable that these people were also the ancestors to the historic Woodland Cree groups who inhabited the same region.

CHAPTER FIVE

5.0 PRESENTATION OF FINDINGS FROM PEHONAN AND KESKATCHEWAN SITES

5.1 Introduction

This chapter describes the findings of the research conducted on pottery from various Pehonan sites in order to test the hypothesis and research goals. First, a description of selected sites is given. A recent proposal regarding the reevaluation of the Pehonan complex is briefly presented. It is included as it is directly related to the selected sites. Finally, a description of the findings will be presented. This includes the results of the analysis of textiles impressed on Pehonan pottery, including fiber, yarn, fabric, and structure as well as fabric scale, density and complexity. Frequencies and percentages as well as minimum, maximum and mean values are calculated for the sample. Vessel and textile characteristics are also given, including vessel size, fabric wear and orientation of fabric on the vessel.

5.2 Review of Selected Saskatchewan River Sites

Sites were selected on the basis of the presence of reconstructed or partially reconstructed vessels recovered from controlled excavations. Vessels from a number of sites were included in the data base to ensure the representativeness of observations made in the study.

All selected Saskatchewan sites (Figure 5.1) were located on the now inundated alluvial terraces, Bushfield's Flat and Lloyd's Flat. Bushfield's Flat was formerly situated approximately ten metres above the shoreline of the Saskatchewan River. These sites were impacted by the construction of the Nipawin Hydroelectric dam. Dam construction was completed in 1985 and created a reservoir which extends 65 kilometres upstream from the town of Nipawin. Bushfield's and Lloyd's Flats were inundated by the reservoir (Meyer 1990:1; Gibson 1994:1). Archaeological evidence suggests this locale was an important aggregation point over a long period, both in pre-contact and historic times (Meyer et al. 1992:217-220). There were at least five pre-contact Selkirk sites in the vicinity, as well as the Francois-Finlay, Fort Nipawi and Thorburn fur trade posts (Burley et al. 1982:244).

The Pas Reserve site, located in Manitoba is also located along the Saskatchewan River (Figure 5.1). It was included in this study because its vessels closely resemble those of the Bushfield West site and are believed to belong to the same complex (Gibson, personal communication 1994).

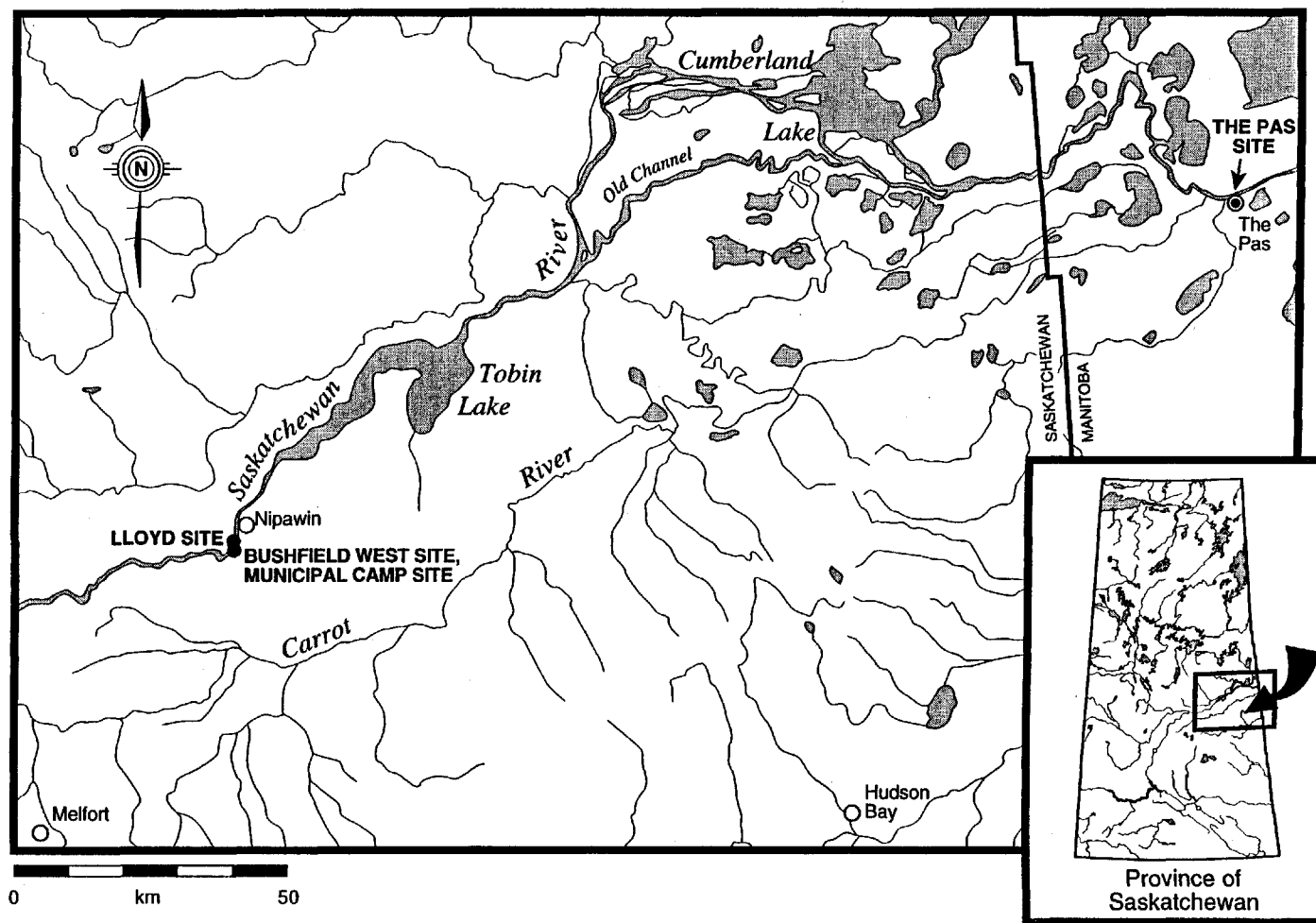


Figure 5.1. Map showing selected Saskatchewan River sites. (Map courtesy of Shelley McConnell.)

5.2.1 Bushfield West Site (FhNa-10)

The Bushfield West site was discovered in the early 1960s on the northwest end of a river terrace known as Bushfield's Flat (Figure 5.1). First recorded in 1976 by Saskatchewan Research Council (SRC) archaeologists, it was recommended for a large scale operation after a 1981 site assessment and salvage excavation (Burley et al. 1982:237, Gibson 1994:1). Between 1982 and 1984, extensive excavation and intensive site assessment were undertaken resulting in the exposure of approximately 625 square metres of productive occupation (Gibson 1994:5).

The archaeological remains exposed on the Bushfield West site appear to reflect the spring aggregation activities of bands which were separated during the winter. Interpretations of artifact clusters found within exposed tent areas indicate various activities took place. These include food preparation, clothing repair, animal butchering and various kinds of ceremonial activity (e.g., sweat lodge) (Gibson 1993:103-111; 1994:34).

The Bushfield West site was selected for this study because it is the largest site and contained the most pottery recoveries. It was originally considered as one of the "type sites" for the late Pehonan complex (Burley et al. 1982:246). Nearly 10,000 sherds were collected representing 98 vessels. Forty-nine were recovered from *in situ* context. Most *in situ* pottery recoveries were discovered in clustered association with other sherds, rather than as isolated specimens. This not only simplified reassembly but enabled vessel forms to be accurately depicted

as more than half of the vessel reconstructions include the rim, neck and shoulder portions (Gibson 1993:101;1994:8) (Figure 5.2).

Gibson (1994:77) interpreted ceramic recoveries from the Bushfield West site to represent heavy cooking, utility and boiling pots. The heavily encrusted cooking vessels could be directly correlated with the presence of a large quantity of smashed bone and large, well-used hearths. The utility and boiling pots were possibly used for non-food processing such as boiling liquids or for storage. Gibson (1994: 94) notes that vessel form is somewhat variable. The average orifice diameter is only 14 cm, yet the vessel range is between 6 and 25 cm. The boiling pots tend to be small in size and the cooking pots tend to be the largest. However, two reconstructed cooking pots measure under 10 cm in orifice diameter. Ten vessels were selected for this study from the *in situ* recoveries. Vessels representing heavy cooking, utility and boiling pots were included in this sample.

Unusual stylistic motifs on some of the pottery recovered indicated that some form of contact with other native groups was made by the inhabitants of Bushfield West. The presence of exotic shell (e.g. dentalium), metals (e.g. one piece of iron and one piece of brass or copper), and uncommon lithic materials (e.g. obsidian) also indicate that the occupants were involved in long-distance trading networks (Gibson 1993:102;1994:8). It should be noted that Meyer et al. (1990:69-73) found the shell recovered from a neighbouring Pehonan site, the Bushfield East site, was not in the Pehonan occupation, but belonged to a nineteenth century grave.

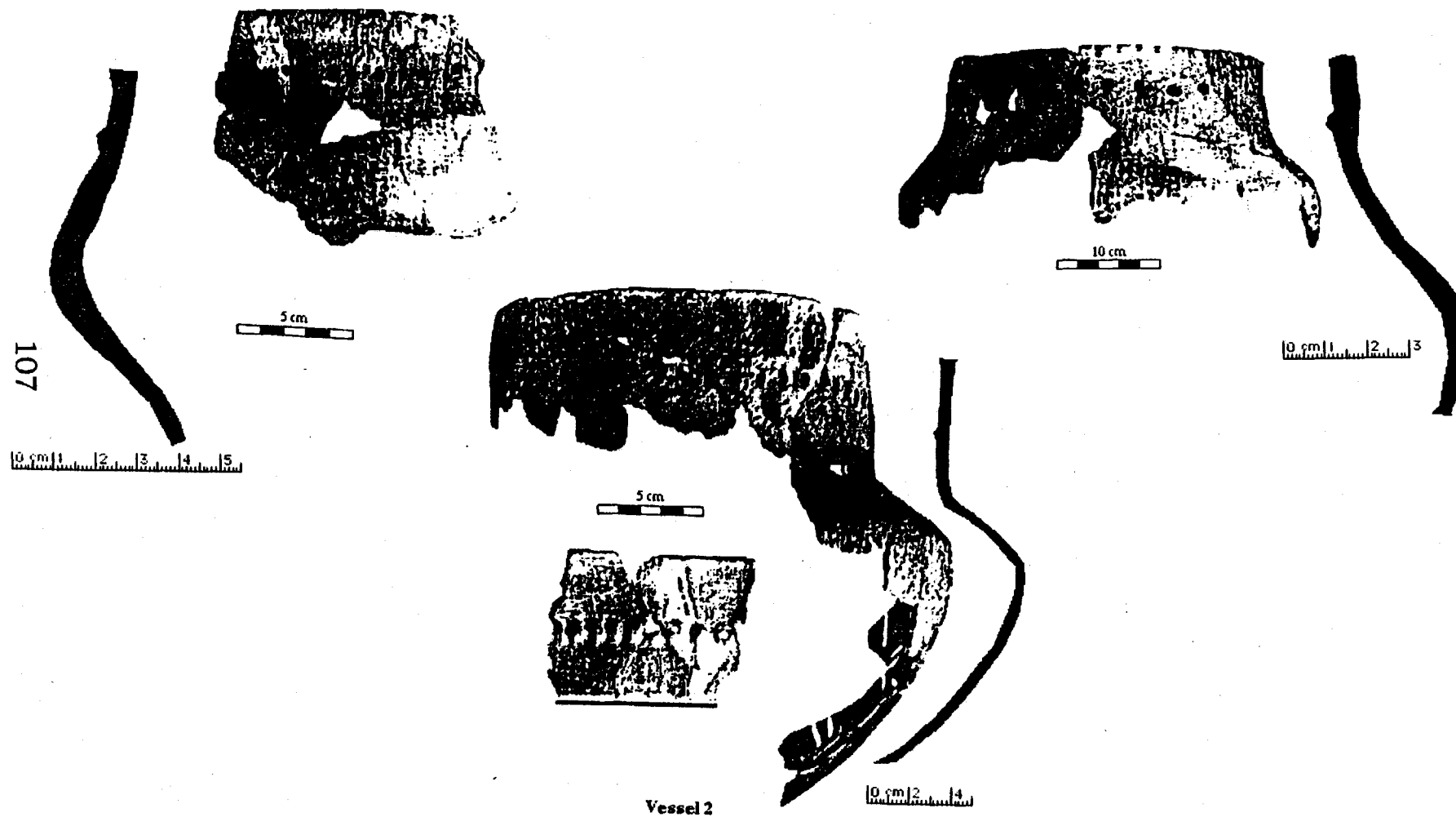


Figure 5.2. Examples of Bushfield West vessels. (Courtesy of Western Heritage Services.)

Three radiocarbon dates have been obtained from cultural materials recovered from the site; however, radiocarbon based chronologies have proven to be imprecise when dating relatively recent archaeological components. Taken from a broad perspective, the paleosol was probably established approximately 500 years ago (about A.D. 1500) and was presumably habitable for a number of years. Gibson (1993:100) states that artifacts and features found on top of the paleosol appear to be a number of decades younger, perhaps dating to A.D. 1600. The encampments were seasonal in duration and were revisited for an unknown number of years. A major flood inundated Bushfield Flat soon after the last occupation, perhaps making it inhospitable. Within a few decades, European traders established trading posts at the south end of the flat (Gibson 1994:32-33).

5.2.2 Lloyd Site (FhNa-35)

The Lloyd site was discovered in 1976 during the Nipawin archaeological surface survey. It occupied the extreme southern portion of the alluvial terrace and was located about four kilometres south of the town of Nipawin (Figure 5.1)(Quigg 1983:67,74). In 1981, the SRC carried out a site assessment with limited salvage excavation. Extensive excavation was recommended as testing revealed that this site had some intact late pre-contact occupation. The resulting 1982 mitigation constituted the final heritage resource conservation measure to be conducted at the Lloyd site as it lay within the dam site location. The site was completely destroyed by late 1982 (Quigg 1983:67,76).

One hundred and five square metres were excavated between 1981 and 1982. A substantial quantity of cultural remains were

recovered, with more than 17,000 specimens being excavated. These included fire-cracked rock, formed tools, potsherds, faunal specimens, lithic debitage and cores. Concentrations of archaeological material provided evidence that a variety of cultural activities took place at the site. These materials, with a hearth and refuse piles, indicate the presence of a campsite where food preparation, butchering and tool preparation occurred (Quigg 1983:76-77, 84, 111). Pits containing fire-cracked rock may be evidence of the use of boiling pits, or more likely, sweat lodges (David Meyer, personal communication 1995).

A significant variety of faunal remains were recovered with a total of 24 species identified (Quigg 1983:179). This diversity is characteristic of the southern edge of the boreal forest (Quigg 1983:194). The presence of mammal foetal remains, as well as the type of bird and fish remains, indicate that the site was occupied in the late spring and early summer (Quigg 1983:200-201).

The tool assemblage associated with the Lloyd site is typical of that associated with the Pehonan complex. Almost all lithic material was locally available except for a few pieces of Knife River flint (Quigg 1983:108, 204). Although bone gorges were recovered from the site, no barbed harpoon points were found. Quigg (1983:191-192) speculates that the site occupants could have used weirs and dip nets for fishing.

A minimum of 10 distinct vessels were represented by the recovered 828 potsherds. Four vessels could not be sufficiently reconstructed to determine whether they had distinct Pehonan characteristics (i.e., shoulder treatment). Their exterior surface treatments and punctates, however, are characteristic of Clearwater Lake

Punctate vessels. Three vessels are considered to belong to the Pehonan complex (Quigg 1983:167-168). Two of these vessels have been included in this study. An additional feature not found in Pehonan vessels was the shell temper used in one vessel (Quigg 1983:169).

There remained 717 body sherds excluding those sherds reconstructed for the purpose of defining the 10 identified vessels. Because the sherds were too small (the majority being less than two square centimetres), Quigg (1983:166) found that determining weave patterns from impressions could not be accomplished in any great detail. Many of the impressions were shallow and the majority were also smoothed prior to firing. It should be noted that the impressions did not differ significantly among the vessels (Quigg 1983:166).

Four radiocarbon dates were taken from the site. From estimations based on the dates, it is believed the Lloyd site was occupied in the mid to late A.D. 1400's. Although two shell casings and a lead musket ball were recovered from the plough zone, it is believed they reflect historic or contemporary hunting activities (Quigg 1983:176-177).

5.2.3 Municipal Camp Site (FhNa-113)

Unlike the other sites on Bushfield Flat, which were situated along the margins of the lower terrace, the Municipal Camp site was located almost 200 m south of the terrace edge. For this reason, the Municipal Camp site was slightly elevated above the other late pre-contact sites on Bushfield Flat (Meyer 1990:1). Initial assessment of the site was conducted in 1983 with excavations and further assessments occurring in 1984 and 1985. As a result, 54.5 square metres were excavated along with an additional 28 assessment units, each 50

centimetres square (Meyer 1990:3). The assessment units provided evidence that there were two occupations, one was believed to be Selkirk and the other was thought to be of Middle pre-contact age (Meyer 1990:5).

Meyer (1990:3) notes that from the beginning of their work at the Municipal Camp, the remains seemed to be different than those of neighbouring Selkirk sites. This was evidenced by an unusual pottery vessel and some elaborate bone tools. Also found were some red paint material, a fragment of a bone whistle or flute, a piece of worked steatite and a small slab of schist. Although the styles of projectile points and end scrapers were consistent with those of regional Selkirk sites, the frequency of lithic tools was different than that of neighbouring sites (Meyer 1990:7).

Faunal remains also differed radically from those at the neighbouring Lloyd site. Fish and bird remains were absent, as were moose and bison. However, the faunal remains at the Municipal camp did include some large ungulate foetal bone fragments. These foetal elements reflect a late winter or spring occupation (Meyer 1990:8).

Although only one vessel was recovered from Municipal Camp, it is unique (Figure 5.3). This vessel has the typical paste characteristics and surface treatment (smoothed textile-impressed exterior) exhibited by other Pehonan vessels. However, it has double crosses incised at four quarters on the lip surface and a single line incised just below the angular shoulder. Six incised rectangles alternate with six incised three-toed "bird's feet" to decorate the neck. The most striking feature is a vertical band of red paint (5 to 6 cm wide) which begins at one lip,



Figure 5.3. Municipal Camp vessel. (Courtesy of David Meyer.)

passes down the side of the vessel, around the base, and then up the opposite side where it terminates at the lip (Meyer 1990:7).

Based on the distinctive nature of the artifact assemblage from Municipal Camp, Meyer (1990:10-13) believes the site reflects some specialized use of the location. Many of the artifacts recovered seem to reflect everyday activities such as knapping, tool production and food preparation. Most seem limited to male activities. Meyer (1990:11) postulates that the Municipal Camp site was the location of society lodges - men's lodges in particular.

5.2.4 The Pas Reserve Site (FkMh-5)

The The Pas Reserve site was one of three sites tested in the vicinity of The Pas during 1967 (Tamplin 1977:1). Although the site was first formally recorded by the Glacial Lake Agassiz Archaeological Survey in August 1967, it had been known locally for many years prior to this date. The site is located on the north bank of the Saskatchewan River, north of the town of The Pas, on reserve land occupied by The Pas Indian Band (Figure 5.1). The site is situated on an open, grass-covered bank, almost at the edge of the river (Tamplin 1977:123).

Excavations at The Pas Reserve site were conducted during the summers of 1967, 1968 and 1972. The site contained four occupation layers; Selkirk, Avonlea, Laurel and late Archaic. The uppermost layer was defined as Selkirk, and was invariably thin. A discontinuous Avonlea occupation was distinguished in 1968 and was close to the Selkirk layer. At times this layer disappeared and it did not extend into later excavated areas. The Laurel and Archaic layers were separated from the Selkirk layer by up to 10 centimetres of sterile sand. No clear

stratigraphic separation could be discerned for these latter deposits (Tamplin 1977:125,130-131).

The Selkirk occupation involved the excavation of eight partial (1 m x 2 m) and 26 full two metre square units. The most distinctive features of this occupation were hearths which were concentrated in the southwestern portion of the excavated areas. Lithic recoveries included projectile points and scrapers which correspond to the Selkirk types. Ground stone items were restricted to a few smoothed pebbles, possible abraders and a soapstone pipe bowl. Bone implements consisted of awls or needles, fleshers and drilled pieces. About 10 fragments of perforated and laced birch bark were also recovered which appear to have been part of a vessel (Tamplin 1977:137).

Thirteen faunal species were identified for the Selkirk layer. Suckers and carps were heavily represented in this occupation, while surface feeding ducks were the most prevalent bird type. The high frequency of migratory waterfowl attest to a late spring to early fall occupancy (Tamplin 1977:150-160).

Ceramic recoveries were represented by a number of isolated rim and body sherds, as well as three partially reconstructed vessels and one almost complete vessel (Figure 5.4). The motifs consist of either a single or double row of exterior punctates around the neck of the vessel, with a corresponding row of interior bosses. In addition to the larger vessels, a single example of a so-called "toy pot" was recovered. Although some fragments of unfired clay were found, there were no definite remains of pottery manufacture (Tamplin 1977:136). Only one of the reconstructed vessels was available for analysis as part of this study.



Figure 5.4. The Pas Reserve vessel. (Courtesy of David Meyer.)

Three radiocarbon dates were obtained for this site. It is estimated that the site was occupied between A.D. 1390 and A.D. 1480 (Tamplin 1977:137). The site's occupation was, therefore, comparable to the Selkirk sites upstream in the Nipawin region.

5.3 The Keskatchewan Complex

Based on fairly extensive observations of surface collections from the most significant Selkirk sites, Gibson, (personal communication 1995) hypothesizes that the Bushfield West site is part of a Selkirk complex which seems to extend along the Saskatchewan River east to The Pas and probably northward along the Sturgeon-Weir River system. Gibson believes the pottery is homogeneous in style and form, distinct from other Selkirk wares, and is distributed along a logical geographic corridor, primarily defined by the Saskatchewan River.

Gibson (personal communication 1995) postulates that although the pottery from the Saskatchewan River appears similar to pottery from Clearwater Lake and Pehonan complex sites, it actually exhibits few of the genuine Pehonan ceramic attributes in any significant frequency. The conservative, repetitive decorative style used on almost all pots (cord-wrapped-tool impressions on lip, single row of punctates below the lip, textile finish on body exterior, rounded but sometimes prominent vessel shoulder, straight long rim) suggest a strong group identity reflected by their pottery. None of the identified vessels from Bushfield West display the characteristic Pehonan shoulder decoration, although two decorated shoulder sherds were collected from the field surface in 1976 (Meyer 1981:16-17). Similarly, "S" profiles appear on only a few vessels. Taken

together, Gibson (personal communication 1995) believes less than 10% of the Bushfield West vessel assemblage bears attributes definitely associated with Pehonan pottery.

Gibson (personal communication 1995) believes that Bushfield West represents an archaeological manifestation of a regional band. From his observations, Gibson feels it necessary to define another Selkirk complex to represent this manifestation. He argues that the "Keskatchewan complex" (derived from the Cree term for Saskatchewan River) is one of the most distinct within the Selkirk composite. The proposed Keskatchewan complex is viewed as a material culture derived from a distinct regional band whose area of resource extraction (at least in the spring and summer) was focused on the margins of large river flats of the Saskatchewan River east into the Saskatchewan Delta and north along connecting river systems. They shared many material culture similarities with other Selkirk bands. The ceramics, however, are sufficiently distinctive to separate them from other complexes.

Gibson (personal communication 1995) assumes that the Keskatchewan and Pehonan complexes were contemporaneous. He suggests that the Pehonan group was a plains-oriented Selkirk band who frequented parts of the Saskatchewan valley where it contacted the open parkland. Pehonan and Keskatchewan bands may have had some contact but on the basis of minimal Pehonan pottery recoveries from Bushfield West, Gibson argues it was not a close intermixing. Meyer (personal communication 1995) suggests that the Keskatchewan complex was the ancestral Selkirk culture, out of which Pehonan developed in the upper Saskatchewan River valley. He (1981:31) has proposed that the Pehonan

complex is a "Selkirk manifestation which has been heavily modified as a result of plains contacts."

Gibson (personal communication 1995) cautions that his hypothesis is tentative and based on limited observations of surface collections. It is possible that the Bushfield West assemblage can be considered a sub-set of Pehonan. Gibson (personal communication 1995), however, argues that Bushfield West is representative of a defined group of people as manifested by an extensive and well preserved archaeological component laid down at a time when virtually all members of the community were together in one place at one time.

All vessels analyzed for this study were recovered from Selkirk sites found along the Saskatchewan River. At least two, the Bushfield West site and the The Pas Reserve site, are representative of the regional variant tentatively defined as the "Keskatchewan complex". This textile analysis may shed further light on the relationship between the Pehonan and Keskatchewan complexes.

5.4 Attributes of Pehonan/Keskatchewan Textile-Impressed Pottery

Fourteen textile-impressed Pehonan/Keskatchewan vessels were examined from four sites (see Table 5.1). Portions from eight rim sections and six body sections were analyzed. Textile attributes found on twelve vessels were identified with some certainty. These include measurements regarding fiber, yarn, structures and complexities. Table 5.2 presents the measured attributes of all Pehonan textile impressions which were analyzed. As stated earlier, not all attributes could be measured for each textile. Along with fabric attributes, additional

information is also taken into account in order to determine the function of the textiles in the pottery manufacturing process. This information includes vessel characteristics, orientation of impressed textiles on the vessels and condition of textiles.

Table 5.1 Summary of selected Saskatchewan River sites

Site Number	Site Name	Number of Vessels
FhNa-10	Bushfield West	10
FhNa-35	Lloyd	2
FhNa-113	Municipal Camp	1
FkMh-5	The Pas Reserve	1
4 Sites	Total	14

It should be noted that the analyzed sample set is too small and selective to be considered statistically representative of all textile-impressed pottery for the Pehonan complex. The data, however, provides useful information on a sample of textile attributes and their associated pottery.

5.4.1 Fiber

Based on ethnographic accounts, the fibers represented in this sample could be either of plant or animal origin. Evidence of extensive fiber shredding and/or separation, is not indicated in the impressions. This suggests that comparatively long strands may have been utilized. It is possible that long strands of babiche or sinew were used. Alternatively, elongated strands of plant fibers (bast or root, for example) may have been utilized. However, it may not always be possible to see evidence of shredding due to the coarseness of the paste

**Table 5.2 Summary of attributes for all Pehonan/Keskatchewan
impressed textiles**

	min.	mean	max.	no. cases
Warp diameter, mm	1.6	2.05	2.9	8
Weft diameter,mm	1.8	2.54	3.2	14
Warp twist category	1.0	1.50	2.0	2
Weft twist category	1.0	1.83	3.0	6
Warp elements per cm	1.5	2.53	4.0	14
Weft elements per cm	4.0	6.62	10.0	13
Weft rows per cm	2.0	3.31	5.0	13
Fabric count	7.0	8.95	12.0	13
Warp density	3.4	5.00	6.3	8
Weft density	4.4	8.62	15.0	13
Total density	10.5	14.17	17.2	7
Complexity Index No.1	3.0	3.38	4.0	13

of the pottery (Kuttruff and Kuttruff 1992:7). Smoothing of the textile-impressed surface before firing may have also removed the subtleties required to determine the fiber structures.

5.4.2 Yarn

All the yarns analyzed appear to be unspun or single spun. In many cases it cannot be conclusively stated which type is represented. There does not seem to be any evidence for plied spun yarn. Again, this may be a result of the characteristic smoothing of Selkirk vessel surfaces which could have obliterated evidence of yarn construction.

Yarn twist is considered important because tightly twisted yarns are generally stronger and involve somewhat more construction time than loosely twisted yarns (Drooker 1990:171). The direction and the angle of yarn twist were recorded for six samples. In all observed cases, the yarns were twisted to produce an S (\) slant. The twist angle for two warp elements were identified. One did not appear to have a twist and the other has a twist between 11 and 25 degrees. According to Emery (1966:12), the latter represents a medium twist. Three weft elements were also designated as having a medium twist. One weft element had an angle less than 10 degrees which constitutes a loose twist, whereas another weft element had a tight twist with a twist angle between 26 and 45 degrees. Drooker's (1989:102; 1990:186, 1992:45) category scheme has been adopted for Table 5.2 (see Figure 2.2).

Diameters of warp yarns average slightly smaller than diameters of weft yarns. The mean diameter for warp yarns is 2.05 mm versus 2.54 mm for weft elements. The ranges are very similar with wefts being slightly larger than the warps. Over 82% of the measured diameters for

both warps and wefts are larger than two millimetres. Although not fine yarns, the examined impressions consist of yarns which were generally uniform in nature and did not appear poorly made. In her assessment of Wickliffe impressions, Drooker (1990:170) found that yarns in weft-faced fabrics were notably larger than other fabric structure categories. Therefore, the size of yarn may not always reflect the typical yarn size, but the preferred size for the type of employed structure (Drooker 1990:170).

5.4.3 Fabric

Of the 14 Pehonan/Keskatchewan vessels examined, fabric structures could be identified for 12 (Table 5.3). Twining is the predominant structure exhibited on the impressed pottery. Two structural variations of twined fabric are also identified. These are compact two-strand twining and weft-faced twining. Compact twining is more prevalent with eight examples, whereas only four vessels are impressed with weft-faced fabrics. All but one twined structure was produced using a S-twining twist (Figure 5.5). The single fabric structure comprising of a Z-twining twist was identified in a vessel examined from the Bushfield West site (Figure 5.6). Samuel (1982:91-92) and Drooker (1990:176) note that S-twisted twining goes hand-in-hand with S-twisted yarns because it is easier and more efficient to twine in the same direction as the weft yarn had been twisted. The action of the twining turns the yarn in the direction of the ply, reinforcing the twist of yarn and visual angle of the twining. If this is not done, the yarns tend to untwist and eventually pull apart (Drooker 1990:176; Samuel 1982:91-92).

**Table 5.3 Textile structure frequencies of Pehonan/
Keskatchewan sample**

	Count	% of Total
<i>Twining</i>	12	85.71
Compact	8	57.14
Weft-faced	4	28.57
<i>Structures unknown</i>	2	14.29
Warp-faced, probably twining	1	7.14
Indeterminate	1	7.14
Totals	14	100.00

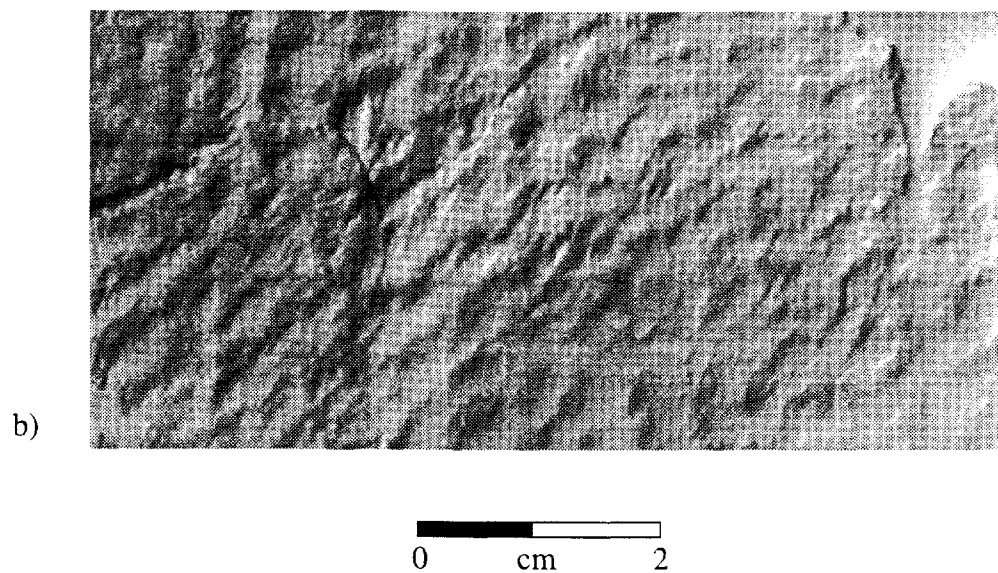
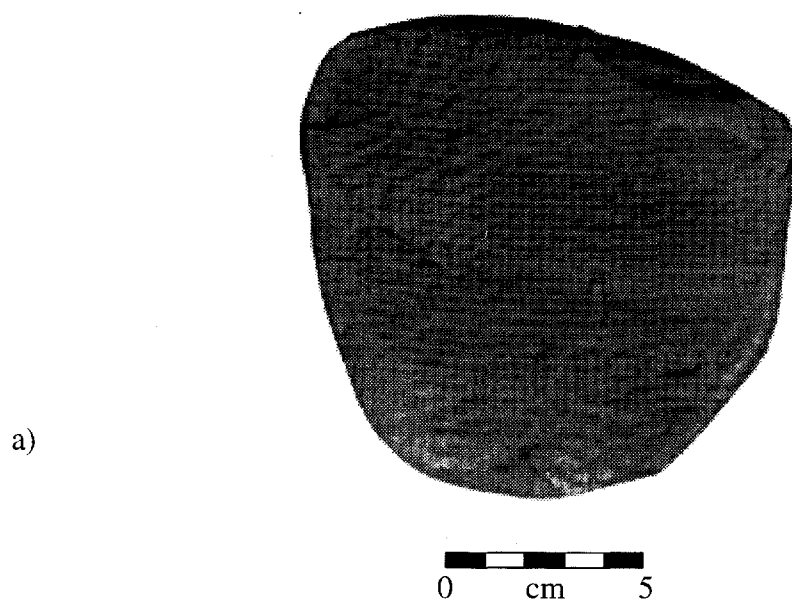


Figure 5.5. Smoothed textile impression (FhNa-35, Vessel 7) with S-twining twist. (a) Actual impression. (b) Detail.



Figure 5.6. Textile impression (FhNa-10, Vessel 2) with **Z**-twining twist.

Yarn characteristics vary somewhat among textile structural groups (Table 5.4). The mean diameter of warp elements in compact twining is only 1.90 mm compared to 2.61 mm for the mean of weft elements. In contrast, the mean diameter for warp elements of weft-faced twining is 2.90 mm. This is larger than the 2.08 mm mean of weft elements in this sample. Only one measurement is available for the warp element and cannot be used as a valid average.

Of the two unknown structures, one is found on a vessel from the Bushfield West site and the other is found on the Municipal Camp vessel. Given the orientation of textiles on other vessels, the impression examined on the Bushfield West vessel appears to have prominent warp strands which give it a warp-faced appearance (Figure 5.7). Although unspun weft elements seem to be visible, there is not enough of a pattern to determine fabric structure with certainty. It should be noted that this vessel form is unusual for the Bushfield West site and resembles a vessel from southwestern Manitoba (Gibson 1994:C-31).

The rim section of the Municipal Camp vessel has been smoothed to the point where the fabric structure is almost completely obliterated. Although some elements are visible, they are indecipherable. Due to the angle of the visible strands and the comparative width of elements, it is probable that a distorted twining structure is represented on this vessel. This structure, however, cannot be identified with absolute confidence.

5.4.4 Fabric Count and Density

Fabric count and density are indicative of how yarns are combined to create a given fabric. Drooker (1989:192, 1990:171, 1992:126) notes that fabric count measures the number of yarns per centimetre, while

**Table 5.4 Summary of Pehonan/Keskatchewan fabric
attributes by textile structure category**

	min.	mean	max.	no. cases
<i>Compact Twining</i>				
(8 samples)				
Warp diameter, mm	1.6	1.90	2.2	6
Weft diameter, mm	2.3	2.61	3.2	8
Warp twist category	1.0	1.00	2.0	2
Weft twist category	1.0	1.00	2.0	2
Warp elements per cm	1.5	2.48	3.0	8
Weft elements per cm	5.0	6.25	10.0	8
Weft rows per cm	2.5	3.13	5.0	8
Fabric count	7.0	8.74	12.0	8
Warp density	3.4	4.66	5.6	6
Weft density	4.4	8.13	13.0	8
Total density	10.5	12.90	17.2	6
Complexity Index No.1	3.0	3.25	4.0	8
<i>Weft-faced Twining</i>				
(4 samples)				
Warp diameter, mm		2.90		1
Weft diameter, mm	2.2	2.08	3.1	4
Warp twist category				0
Weft twist category	1.0	2.00	3.0	4
Warp elements per cm	1.5	2.13	3.0	4
Weft elements per cm	6.0	8.00	10.0	4
Weft rows per cm	3.0	4.00	5.0	4
Fabric count	8.0	10.13	11.5	4
Warp density		5.80		1
Weft density	8.8	10.68	15.0	4
Total density		14.60		1
Complexity Index No.1	3.0	3.75	4.0	4

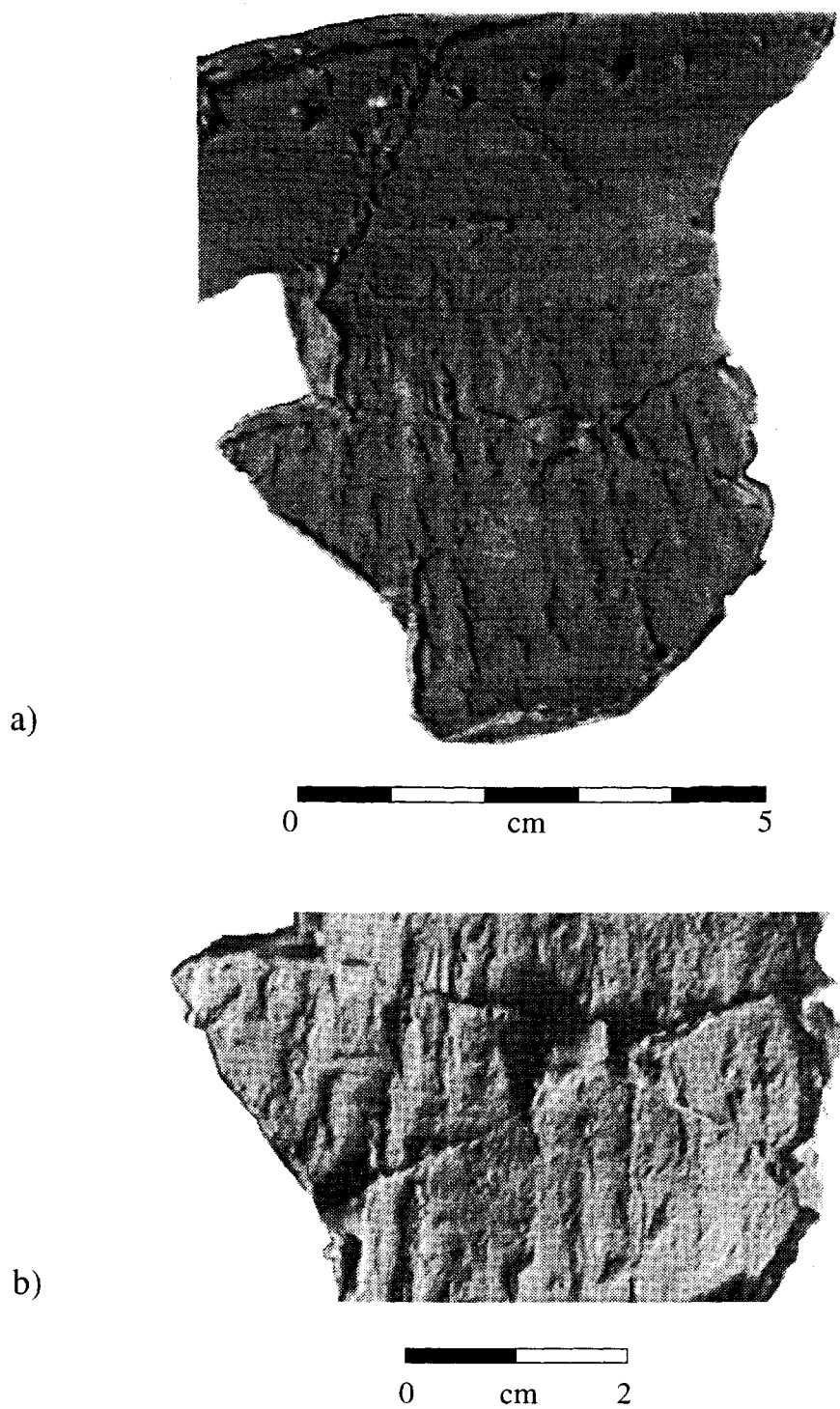


Figure 5.7. Impression (FhNa-10, Vessel 44) with prominent warp elements. (a) Actual impression. (b) Detail.

density also takes into account their diameters, indicating the amount of space in the fabric actually taken up by the yarn. A high fabric count can indicate either a very fine fabric with approximately equal number of warp and weft yarns per centimetre, or a warp-faced or weft-faced fabric (Drooker 1989:192, 1992:126).

Fabric count and density do not vary greatly among the Pehonan/Keskatchewan samples. As mentioned previously, the textiles represented in the sample are characterized by compact twining and weft-faced twining structures. Table 5.2 indicates that warp and weft elements per centimetre show similar ranges. Since the wefts are concentrated in twined pairs, the visual contrast between warp elements and weft rows per centimetre is a better guide than implied by average elements per centimetre (Drooker 1989:193).

Fabric counts range from 7.0 to 12.0 yarn elements per square centimetre. Very fine textiles (with fabric counts greater than 15) do not occur in this sample. Ten (77%) of the vessels have textiles with fabric counts which are 10.0 or less. Although all impressed textile measurements are approximate due to shrinkage of the clay and vessels upon drying and firing, the measurements for burlap can be used for comparing relatively similar fabric attributes of pre-contact textiles to a modern day variety. The fabric count for modern day burlap is 9.6 (Drooker 1989:193, 1990:171).

Total densities range from 10.5 to 17.2. A density of 10 indicates there are no spaces between yarns in a set of elements (Drooker 1989:201, 1990:171). The total density of weft-faced textiles is expected to be higher than that found in plain twined textiles. Although limited to

the average of one impression, it appears that the weft-faced example has the highest total density.

5.4.5 Textile Production Complexity

Textile complexity (Table 5.2, Table 5.4) provides values for the production process of a given textile such as labour input and decision-making (Drooker 1990:172). This means decorated textiles take more time to construct and more mental effort than plain-twined or weft-faced textiles. Modified Index values, as defined in Chapter 2, could be obtained for only the Modified Complexity Index No.1. Information necessary to compute the remaining two indices was lacking for the Pehonan sample. The mean Modified Index value for Pehonan textiles for Index No.1 was 3.38. This value is slightly more complex than that of burlap, which has a Modified Index of 3 (Drooker 1990:172). Although complexity varies somewhat between compact twining (a mean Index No.1 of 3.25) and weft-faced twining (a mean Index No.1 of 3.75), this group is less complex than that found in plain-twined and alternate-paired-twined textiles (Drooker 1990:172).

5.4.6 Fabric Wear and Manipulation

Fabric wear on some impressions was noted during analysis. This is evident by missing elements (two examples) and fabric distortion (eight examples). As noted by Kuttruff and Kuttruff (1992:21), fabric distortion is evidenced by overly irregular twining rows that may have been forced out of their original position by stress applied during the use of the textile. Fabric distortion (Figure 5.8) is considered present when the angle of intersection between active and passive elements differs considerably from a 90 degree angle (Kuttruff and Kuttruff 1992:21).

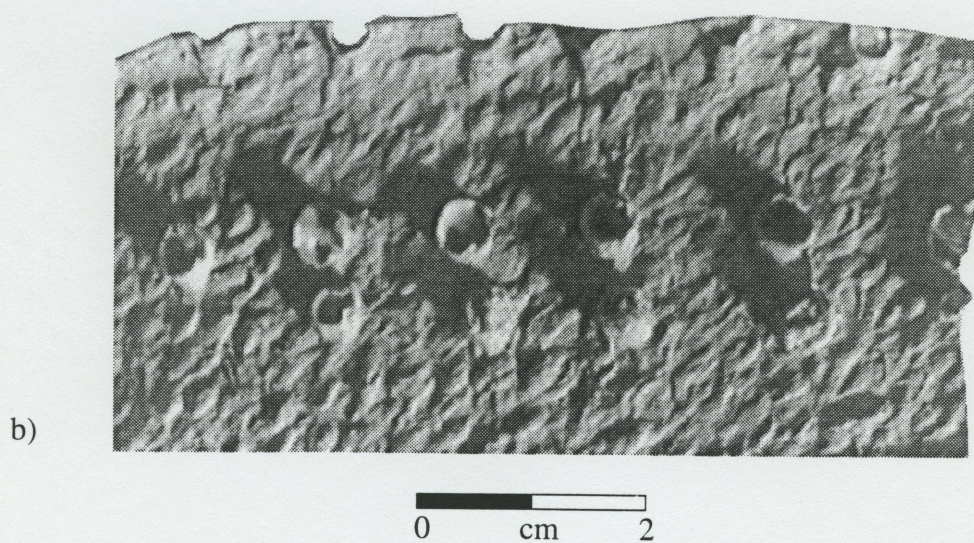


Figure 5.8. Impression (FkMh-5, Vessel 1) exhibiting fabric distortion.
(a) Actual impression. (b) Detail.

This distortion has been observed only for the upper rim and neck portions of six vessels. Impressions from body sherds do not exhibit the same distorted twining structures.

Overlapping of fabric has been noted in three of the impressions. These were observed only on body/basal areas of the vessels and were not noted for neck or rim impressions. Overlapping is evidenced by the fabric being oriented at oblique angles. The characteristics of the overlapping textiles appear the same. It is possible that the overlapping textiles represent folds of the same fabric or edges of a bag and could reflect the function of the fabric in relation to vessel construction.

Orientation of fabric relative to the rim was recorded. Textile impressions found on rims invariably have warp yarns perpendicular to the rim with weft rows parallel to the rim. Drooker (1989:235) states that fabric design or edges which were specifically oriented to correspond with aspects of vessel form are possible indicators of a decorative intent on the part of the maker. No such relationship could be determined for the Pehonan vessels. For example, six rim impressions exhibit surfaces which were smoothed prior to the application of the punctate row. Except for three examples which appear to exhibit stitching, no textiles containing more than one structure occur on the rim sherds. The stitches may have been used to reinforce the twining structure or to hold some type of ornamentation. No repairs or darning seem evident in the samples.

5.4.7 Correlation Between Vessel Type and Textile Characteristics

The question of whether textiles used in pottery manufacture were selected on the basis of vessel function is an important consideration when various vessel forms and functions can be distinguished. No correlation between vessel size and fabric scale is evident among the Pehonan/Keskatchewan vessels. Two small (possibly miniature) vessels from the Bushfield West site have fabric counts of 10 and 11.5. Although these are slightly higher than the mean, four recognized cooking vessels have fabric counts which are 7, 8.8, 10 and 11. Two exhibit similar fabric counts as the smaller vessels. Overall, the textiles used in constructing Pehonan pottery are fairly homogeneous.

5.5 Summary

Analysis of the textiles used in the production of Pehonan and Keskatchewan pottery is one of the few methods available for assessing the textile industry of pre-contact northern Algonquian peoples. Textile-impressed vessels from different geographic locations, representing various sizes and types of Pehonan and Keskatchewan sites, were studied. Although based on limited data, this preliminary study demonstrates that attributes found on their textile-impressed pottery provides evidence which supports a close cultural relationship between these two complexes. It has been shown that similarly structured twined textiles were utilized by Pehonan and Keskatchewan potters in constructing their vessels.

CHAPTER SIX

6.0 PRESENTATION OF FINDINGS FROM KAME HILLS SITES

6.1 Introduction

This chapter describes the findings arising from the research conducted on textile-impressed pottery from the Kame Hills complex. Some of the archaeological investigations represented in this sample are the result of the Churchill Diversion Archaeological Project (CDAP) which was initiated in 1969 and continued to 1975 as a part of the Churchill River Diversion Project (CRDP) (Kroker 1990:38-39). The CDAP was established to investigate sites which were to be impacted by the damming and diversion of the Churchill River and the development of the Nelson River for hydroelectric power generation. Archaeological surveys continue to be conducted in this region and sites continue to be located. Pottery from more recent investigations has also been included in this study.

In order to understand the nature of the recoveries, a brief review of the Kame Hills sites is necessary. Unfortunately, published data is lacking for many of the included sites and unpublished field notes from the Manitoba Historic Resources Branch (MHRB) are the basis for many

of the ensuing site descriptions. This section is followed by the results of the analysis of textiles impressed on Kame Hills pottery. As with the Pehonan and Keskatchewan textiles, this will include descriptions of fiber, yarn, fabric and structure as well as fabric scale, density and complexity. Textile characteristics, in relation to vessel size and form, will also be provided. This will include information related to the vessel, itself, as well as fabric wear and orientation of fabric on the vessel.

6.2 Review of Selected Kame Hills Sites

Kame Hills sites from various locations within the Southern Indian Lake region (Figure 6.1) were selected in order to determine the homogeneity of the complex. The availability of reconstructed and partially reconstructed vessels also determined the choice of sites (Table 6.1). All vessels analyzed are considered to be representative of the Kame Hills complex. Surface collected specimens, as well as those recovered from controlled excavations, have been included in this study.

6.2.1. Kame Hills Site (HiLp-1)

The Kame Hills site is considered the "type site" for the Kame Hills complex. It was located on the western shore of Southern Indian Lake (Figure 6.1). The site has been recorded as stretching 575 m along the shore and extending 200 m inland. It was situated on two terraces; the first 0.5 m above the beach and the second was .75 m higher. The second terrace merged into a kame and esker complex (Dickson 1983:6; Kroker 1990:100).

The site was first recorded and surveyed in 1971, with subsequent excavations conducted from 1972 to 1975. By the time field research

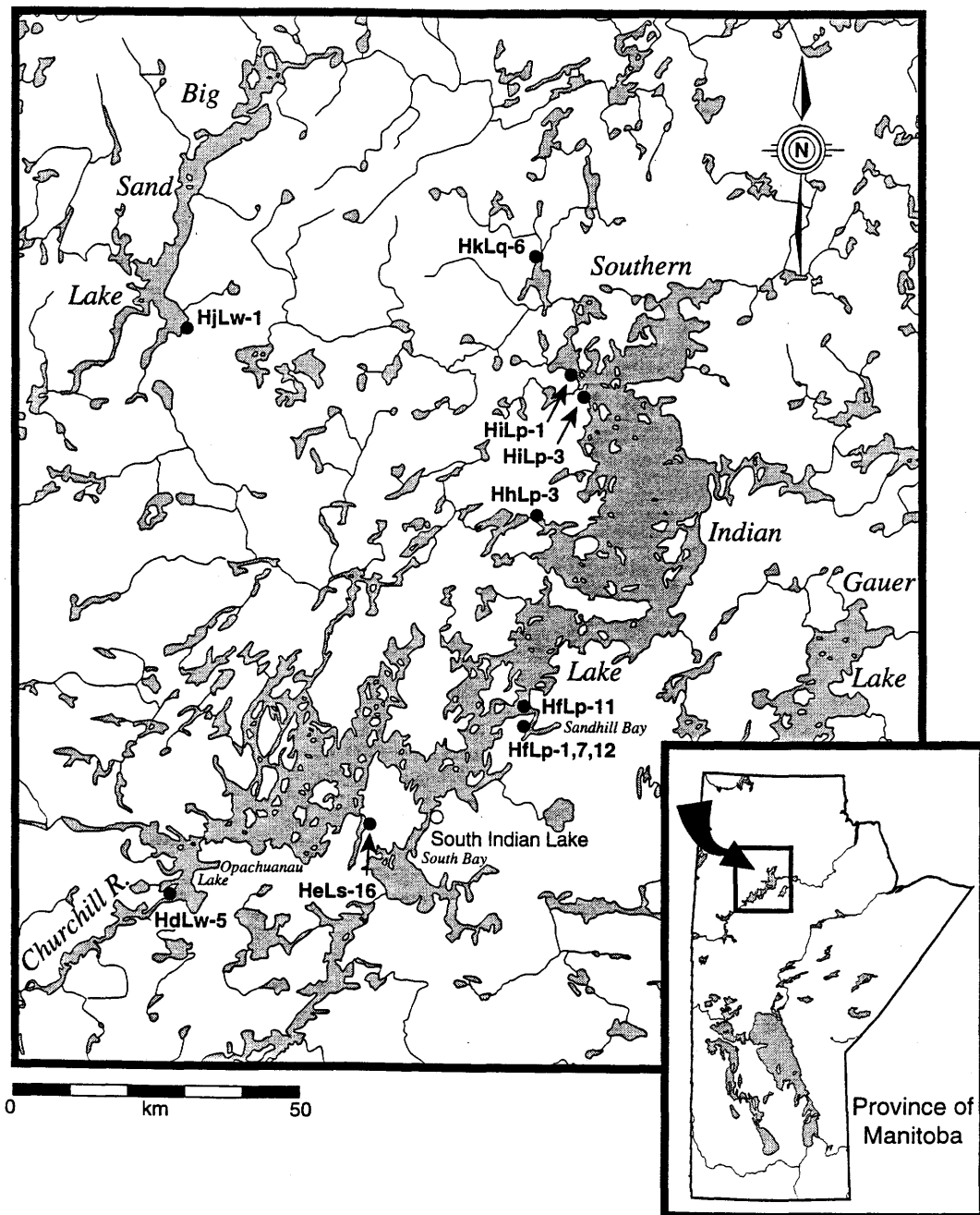


Figure 6.1. Map showing selected Kame Hills sites. (Map courtesy of Shelley McConnell.)

Table 6.1 Summary of Kame Hills sites

Site Number	Site Name	Number of Vessels
HcLv-6		1
HdLw-5	Look For Beaver	1
HeLs-16		1
HfLp-1	One Flake	2
HfLp-7		4
HfLp-11	Fire Island	2
HfLp-12		1
HhLp-3	Hats Come In Handy	3
HiLp-1	Kame Hills	9
HiLp-3	Isthmus	4
HiLv-6		1
HjLw-1	Bruce Taite-Vernon Anderson	3
HkLq-6	First Flooded Little Sand River Rapids	1
13 Sites	Total	33

was terminated in 1975, the total excavated area was 1480 square metres or 2.1% of the site (Kroker 1990:101). The research yielded more than 20,000 artifacts which could be assigned to the Shield Archaic tradition, the Arctic Small Tool tradition, the Pelican Lake complex, the Taltheilei tradition, the Laurel culture, the Blackduck culture, the Kame Hills complex and the Historic period (Dickson 1980:147-151, 1983:6-7; Kroker 1990:102-103). Interestingly, the excavation did not reveal any artifacts which could be assigned to the fur trade period. The artifacts from the historic occupation pertain to the twentieth century and correspond to temporary fishing, trapping and hunting camps (Dickson 1980:153; Kroker 1990:103).

Ceramics were the largest category of recovered material. One hundred and thirty-two vessels were recovered. Sixty were recovered from controlled excavations and the remainder were obtained during surface collection of the site (Kroker 1990:101). Of the 129 vessels assigned to the Selkirk culture, Dickson (1980:150-153) defined 127 as belonging to the Kame Hills complex. As mentioned in Chapter 4, this variant was defined on the basis of the decorative modes (i.e., multiple punctate rows) and the presence of previously unknown vessel forms. The Kame Hills ceramic assemblage comprises 63 plates, 54 pots, five bowls, four cups and a pipe bowl. The present study analyzes nine vessels from this site. Except for the pipe bowl, all vessel forms are represented in the study sample.

Eight projectile points, seven of chert and one of bone, were associated with the Kame Hills ceramics (Dickson 1980:100; Kroker 1990:102). Many of the items in the lithic tool assemblage recovered

from the site, however, could not be confidently assigned to a specific culture due to the lack of stratigraphy (Kroker 1990:102). Bifaces and scrapers found in association with either the radiocarbon samples, diagnostic ceramics or projectile points were tentatively designated as belonging to the culture indicated by the diagnostic artifact (Kroker 1990:102).

Twenty-one faunal species were identified for the Kame Hills site (Dickson 1980:32-40; Kroker 1990:103). These include mammal, bird and fish remains. Mammals accounted for 94.3% of the faunal remains; however, a large majority (79.1%) were too fragmented or calcined to be identified (Dickson 1980:32).

Dickson (1980:41) believes very little can be determined about seasonality from the faunal species identified. Although there were optimal periods of procurement for some species, others were year-round residents and could be procured during most seasons. Age, also, could not be used as an indicator of seasonality. Most individual specimens were at least a year old and most appeared to be adults (Dickson 1980:41). Kroker (1990:103) also notes that given the lack of stratification, very little is interpretable concerning the harvesting practices, the associated cultural group or seasonality.

Dickson (1980:42) speculates that the site was occupied at all seasons of the year. He states that since the site has been inhabited intermittently for the last 3500 years, it is not unusual that this is the case. Historically, the site was occupied in the summer and winter, and possibly in the spring and fall.

Fifteen charcoal and bone samples from the Kame Hills site were submitted for radiocarbon dating. It is estimated that the earliest possible date for Selkirk occupation was A.D. 940. The latest dates obtained were for A.D. 1740 and A.D. 1865 (Dickson 1980:158). Dickson (1980:158) finds the latter dates as unacceptable, however, and suggests that an A.D. 1610 date would be more appropriate.

6.2.2 Isthmus Site (HiLp-3)

The Isthmus site was located approximately one and a half kilometres southeast of the Kame Hills site (Figure 6.1). It was situated on a low narrow sand bar connected to the main shore. The bar, itself, was an average of 75 m wide (Dickson 1983:8). Cultural remains were collected on a low terrace which was approximately 40 m wide. This strip of land, prior to flooding, was only 0.5 to 1.5 m above water (Kroker 1990:99).

The vegetation on the Isthmus site was destroyed by a forest fire in the late 1960s. The fire burned the humus layer and exposed numerous concentrations of ceramics and lithics (Kroker 1990:99). After the site was recorded in 1971, extensive surface collection was carried out. Excavations, conducted in 1972, exposed such features as nine hearths, as well as activity areas represented by the ceramic and lithic concentrations (Dickson 1983:14, 31; Kroker 1990:99).

Species represented in the faunal recoveries are varied. They include caribou, moose, black bear, marten, wolf, beaver, snowshoe hare, grouse and songbird. Interestingly, 18% of the faunal remains are attributed to fish species such as pike and sucker. This is a proportionately large number of fish as compared to other Kame Hills

sites. The bird remains appear to be recent and not related to the pre-contact period (Dickson 1983:19-27).

The pottery recoveries are described in great detail by Dickson (1983:39-59). Thirty-six Selkirk vessels were identified representing 18 pots, 15 plates and three cups. Four vessels from this site have been included in this study (Figure 6.2). An interesting recovery was 138 pieces of daub. Daub is unformed, fired lumps of clay which are assumed to be by-products of ceramic manufacture. Although the daub was associated with the ceramics, there were no other indicators of ceramic manufacture (Dickson 1983:58-59).

The 113 lithic tools excavated indicate a multicomponent site. The five projectile points recovered were identified as belonging to Middle Taltheilei, Late Shield Archaic and Late Woodland types. The Late Woodland point was associated with the Kame Hills pottery (Dickson 1983:61-71; Kroker 1990:99).

Although no dates are available for this site, a piece of brass (out of six historic artifacts collected) was associated with pre-contact remains (Dickson 1983:91-95).

6.2.3 Hats Come In Handy Site (HhLp-3)

The Hats Come In Handy site is located on the banks of the McLeod River, entering a large bay west of Loon Narrows. (MHRB:1971, 1974, 1986). It is situated on the west side of Southern Indian Lake south of HiLp-1 and HiLp-3 (Figure 6.1).

First recorded in 1971, the site was undisturbed prior to flooding. It has been recommended that it continue to be revisited during low

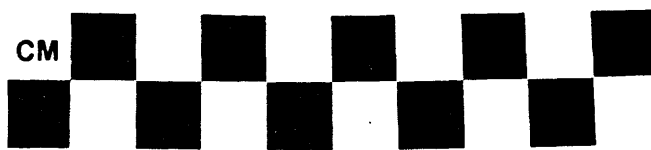


Figure 6.2. Small pot (Vessel 8) from HiLp-3. (Courtesy of the Manitoba Museum of Man and Nature.)

water years (MHRB:1991). Surface collections and/or test units were conducted in 1971, 1974, 1986 and 1990.

Although the site is eroded and has been flooded, its artifacts and features reveal a multicomponent site. Taltheilei, Kame Hills and historic peoples once occupied this site (MHRB:1974, 1991). Features, so far, are represented by a tent frame and many hearths, as well as faunal, lithic and ceramic concentrations (MHRB:1974, 1991). It is the ceramics which define the Late Woodland period and, therefore, the Kame Hills complex. Three vessels from this site have been included in this sample.

6.2.4 One Flake Site (HfLp-1)

This site was situated on the west side of the first narrows at Sandhill Bay (Figure 6.1). Located by Wright in 1966, it was recorded by the CDAP researchers in 1973. Testing was conducted in 1973 and excavations were carried out in 1974 (Kroker 1990:88).

Portions of six Selkirk vessels and one plate were recovered from the excavations. Two vessels have been included as part of this study. Other artifacts recovered include utilized flakes, retouched flakes, lithic detritus and two historic cartridge cases (Kroker 1990:88).

The One Flake site location was reexamined in 1978 after a forest fire burned the vegetation exposing archaeological remains. Fifteen discrete activity areas were noted for this site and an associated site, HfLp-8. Some of these loci were more than 100 m from the pre-flooding shoreline and may have represented fall, winter or early spring residences (Kroker 1990:88).

6.2.5 HfLp-7

Located by a CDAP survey crew in 1969, this site was described as a sand and cobble beach at the base of an esker on the west side of the first narrows at Sandhill Bay (Figure 6.1). Excavations were conducted in 1973 and 1974. Nearly 20% of the site was excavated involving two discrete areas; the shoreline and the esker habitation site. A 250 square metre block area was excavated when it was discovered that artifact concentrations were restricted to the esker portion of the site (Kroker 1990:87).

Seven large and five small depressions observed at the site were interpreted as cabin remains. A test trench (1 m x 4 m) excavated from the interior of one depression revealed charred planking, several round-headed wire nails, numerous tin cans, a patent medicine bottle and a .22 caliber cartridge case (Kroker 1990:87).

Temporally and culturally diagnostic pre-contact artifacts recovered indicate a multicomponent site. The site yielded several ceramic sherd concentrations, two distinct hearths and two cobble concentrations which appeared related to the hearths (Kroker 1990:87). One Laurel vessel, six Selkirk vessels and two indeterminate vessels were identified. Four Kame Hills vessels selected from the Selkirk recoveries are represented in this study. Only one projectile point was recovered and it has been associated with the Laurel material (Kroker 1990:88). Evidence of lithic tool and ceramic vessel manufacture was evidenced by the presence of lithic detritus and a large quantity of daub (Kroker 1990:88).

6.2.6 HfLp-12

HfLp-12 was located in close proximity to HfLp-1 (Figure 6.1). The site was recorded in 1978 and surface collected at that time. Its discovery may be attributed to the fact that the surface area, once moss covered, was destroyed by fire. The site was described as being 20 to 30 m from the shoreline at an elevation of approximately seven metres (MHRB:1978)

The only artifacts recovered were 99 rim and body sherds (MMMN: unpublished specimen catalogue 1987). One vessel was partially reconstructed from some of these sherds. This vessel has been included in this study.

6.2.7 Fire Island Site (HfLp-11)

HfLp-11 was located on the south shore of an island at the mouth of Sandhill Bay (Figure 6.1). The site was recorded in 1974 after artifacts were observed on the island surface as a result of a fire. Material was scattered over an area nearly 750 m long and up to 60 m from the shore. Surface collection was first carried out and then 160 square metres were excavated on the low elevation portion of the site (Kroker 1990:90).

One feature, a hearth which contained three sherds, daub and bone fragments, was identified. Five vessels were also identified, all having the distinctive Selkirk features. Two of these vessels are represented in the study sample (Figure 6.3). Only two lithic tools, a scraper and a hammerstone, were recovered (Kroker 1990:91).

A radiocarbon date was obtained from recovered bone. Kroker (1990:91) cites Dickson (1976:21) who states that the site was occupied

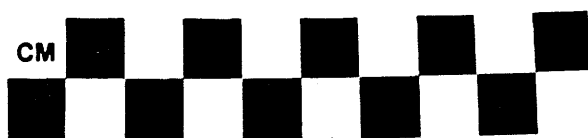


Figure 6.3. Small cup (Vessel 2) from HfLp-11. (Courtesy of the Manitoba Museum of Man and Nature.)

around A.D. 1650 +/- 170. Historic artifacts were recovered west of the excavations and it is believed the site was occupied shortly before the beginning of the fur trade period (Kroker 1990:90-91).

6.2.8 HeLs-16

HeLs-16 was located on a south facing beach on the east side of a bay in the southern portion of Southern Indian Lake (Figure 6.1). The site was recorded in 1992, although it was known locally since the early 1900s. Eroded and inundated, the site survey involved the surface collection of a 5 m x 25 m area of the beach (MHRB: 1992).

Ceramics were the only diagnostic artifact type found. A portion of a reconstructed vessel from this site is included in this study.

6.2.9 Look For Beaver Site (HdLw-5)

HdLw-5 was also recorded in 1992. It was located on the north shore of a small bay on the west side of the Churchill River (Figure 6.1). The site was found on an eroded and flooded beach. Recorded as a campsite, the area was surface collected over a 5 m x 40 m area. Visited during a period when the water was high, it is believed more could have been found when the water was low (MHRB: 1993).

Ceramics belonging to the Selkirk composite were the only diagnostic artifacts recovered. One vessel from this sample has been included in this study.

6.2.10 The Bruce Taite-Vernon Anderson Site (HjLw-1)

HjLw-1 was located on the east shore of the southern portion of Big Sand Lake (Figure 6.1). Although first recorded by the MHRB in 1985, the site had been known locally. The site is believed to be a large campsite, although, its size is unknown. Neck sherds exhibiting three

rows of punctates were recovered from a surface collection of the site. Informants, however, indicate that there are many more ceramic concentrations, including plates (MHRB: 1985). Three vessels from this site have been included in the study sample as they are representative of Kame Hills pottery.

6.2.11 First Flooded Little Sand River Rapids (HkLq-6)

Recorded in 1990, HkLq-6 was located on the now flooded western bank of Little Sand River. It was located in a clearing at the first rapids of the Little Sand River when heading upstream from Moss Lake (Figure 6.1). The site has been dramatically affected by the CRDP (MHRB: 1990).

The site was used as a campsite until recent times. Surface collecting on the shoreline below the normal flood level produced rims from two Selkirk vessels (MHRB: 1990). A vessel from this site was included in this study as it represents the most northerly ceramics of the Kame Hills complex. It also exhibits an interesting variation of the multiple punctate row (Figure 6.4).

6.2.12 HcLv-6 and HiLv-6

No information could be obtained regarding these two sites. It is possible that they represent surveys which involved only surface collections. One vessel from each site is represented in the Kame Hills sample.

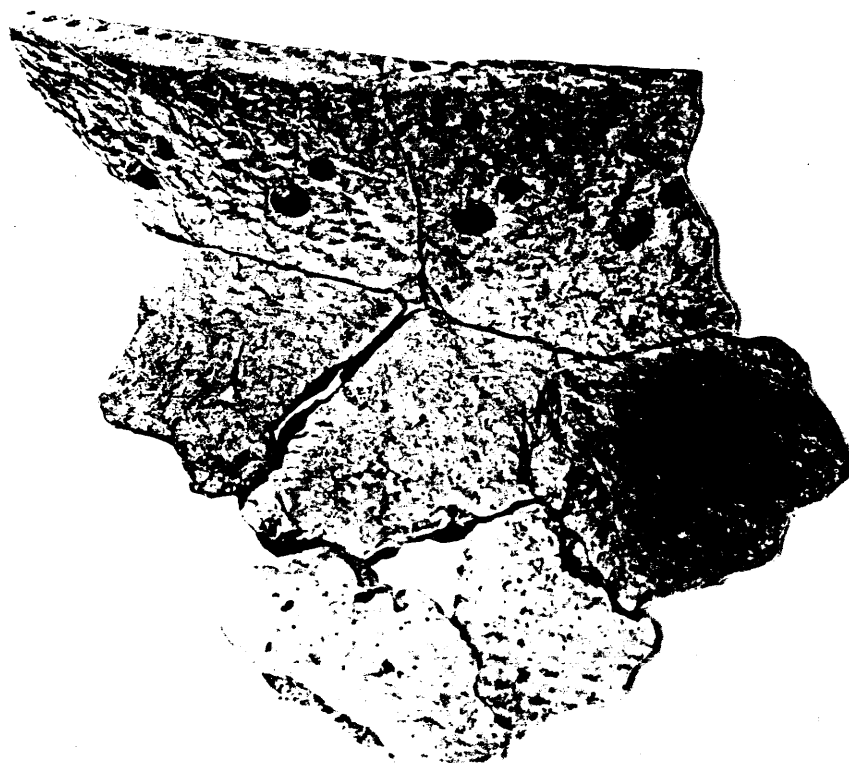


Figure 6.4. Kame Hills complex “Sun and Moon” vessel. (Courtesy of the Manitoba Museum of Man and Nature.)

6.3 Attributes of Kame Hills Textile-Impressed Pottery

A total of 35 impressions were obtained from a sample of 33 textile-impressed Kame Hills vessels. Thirty-one vessel exterior impressions were analyzed as were impressions observed on the interiors of four vessels. The sample includes impressions from the various vessel forms represented in Kame Hills pottery. These include 25 pot exteriors (17 rims sections and eight body portions), four interior pot impressions, three plate impressions, one bowl impression and two cup impressions. Textile structures found on 29 vessels could be identified with some certainty. Table 6.2 describes the measured attributes of all Kame Hills impressions which could be analyzed. As found with the Pehonan/Keskatchewan sample, not all attributes could be measured for each textile. Because there are a variety of vessel forms represented in this sample, it was important to observe factors such as vessel characteristics, orientation of the impressed textiles on the vessels and the condition of the textiles. This information is necessary in order to determine how textiles functioned in relation to the pottery manufacturing process.

The Kame Hills sample is represented by a small number of vessels from each of the 13 sites. These sites, although all considered part of the Kame Hills complex, are geographically dispersed throughout the Southern Indian Lake region. Therefore, this sample is too small to be representative of all textile-impressed pottery for the total Kame Hills complex. The following analysis, however, provides a descriptive interpretation of some of the textile structures used in this region.

Table 6.2 Summary of attributes for all Kame Hills impressed textiles

	min.	mean	max.	no. cases
Warp diameter, mm	1.5	2.37	3.1	18
Weft diameter, mm	1.6	2.68	4.1	29
Warp twist category	1.0	2.00	3.0	5
Weft twist category	1.0	1.60	3.0	10
Warp elements per cm	1.5	2.39	4.0	29
Weft elements per cm	2.0	5.78	8.0	28
Weft rows per cm	1.0	2.88	4.0	29
Fabric count	4.0	8.19	10.5	28
Warp density	4.2	5.66	7.8	18
Weft density	3.2	7.54	10.0	29
Total density	8.2	12.70	17.1	18
Complexity Index No.1	2.0	3.14	4.0	28
Complexity Index No.2	3.5	4.53	5.5	17
Complexity Index No.3	4.5	6.10	8.0	5

6.3.1 Fiber

As with the Pehonan/Keskatchewan sample, very little could be determined regarding fiber selection and processing. There is, however, no evidence of extensive fiber processing in the representative impressions. Fibers represented in the Kame Hills sample may also be of either plant and/or animal origin. Ethnographic accounts indicate that both spruce root and babiche were popular cordage materials; however, most of the observed impressions indicate round-edged fibers were used rather than flat-edged ones. This may indicate that soft fibers were used as opposed to stiff ones (such as babiche). Soft fibers, such as bast, would also produce a much more flexible fabric (Kuttruff and Kuttruff 1992:6).

6.3.2 Yarn

Following Emery (1966:9) and Kuttruff and Kuttruff (1992:7), three classifications of yarn structures could be represented in this sample. These include unspun fibers, as well as single spun and plied spun yarns.

Two instances of unspun yarns are found in the Kame Hills sample. They are represented in warp elements. One consists of strands of fibers where the strands were not twisted together. The other example appears to be a flat element. Other strands may have been obscured by this surface strand. With diameters of 2.8 mm and 2.4 mm, these unspun elements are close to the mean of all observed warp diameters (Table 6.2).

Spun strands were observed for five warp elements. It is not clear, however, if single spun or plied spun yarns are represented. The strands

range from 1.5 mm to 2.9 mm. All were twisted to produce a **Z** (/) slant. The twist angle was also noted for each of these five samples. One has a loose twist (less than 10 degrees), three have medium twists (between 11 and 25 degrees) and one has a tight twist (26 to 45 degrees). As mentioned previously, tightly twisted yarns involve more construction time; however, they are generally stronger.

The most commonly noted yarn structure is two-ply spun yarns. These are created when two single yarns are twisted together. Fourteen impressions exhibit observable two-ply yarn structures. These plied yarns range in diameter from 2.5 mm to 4.1 mm and were observed only for weft elements.

The direction and angle of the ply twist was noted for 12 of the impressions. In all but one instance, where the ply twist was discerned, the yarns were twisted to produce a **Z** (/) slant. The other two impressions have plies which are indeterminate because there is little to no observable twist. In one case, the yarn twist appears to be influenced by the twining twist and it could not be determined if the yarn ply was created using an **S**- or **Z**-twist. As mentioned in Chapter 5, this may be due to **Z**-plied yarns worked into a **S**-twisted twining structure. In doing so, the yarns work against the twining twist causing the plied yarns to loosen (Figure 6.5). Of the **Z**-twisted plied yarns observed, seven examples have yarn twist angles which are loose (less than 10 degrees) and five have medium twists (11 to 25 degrees). The only example of an **S** (\) slanted yarn twist has a medium twist angle. It is possible the twist angles of the **Z**-twisted plied yarns were influenced by the twining twist.

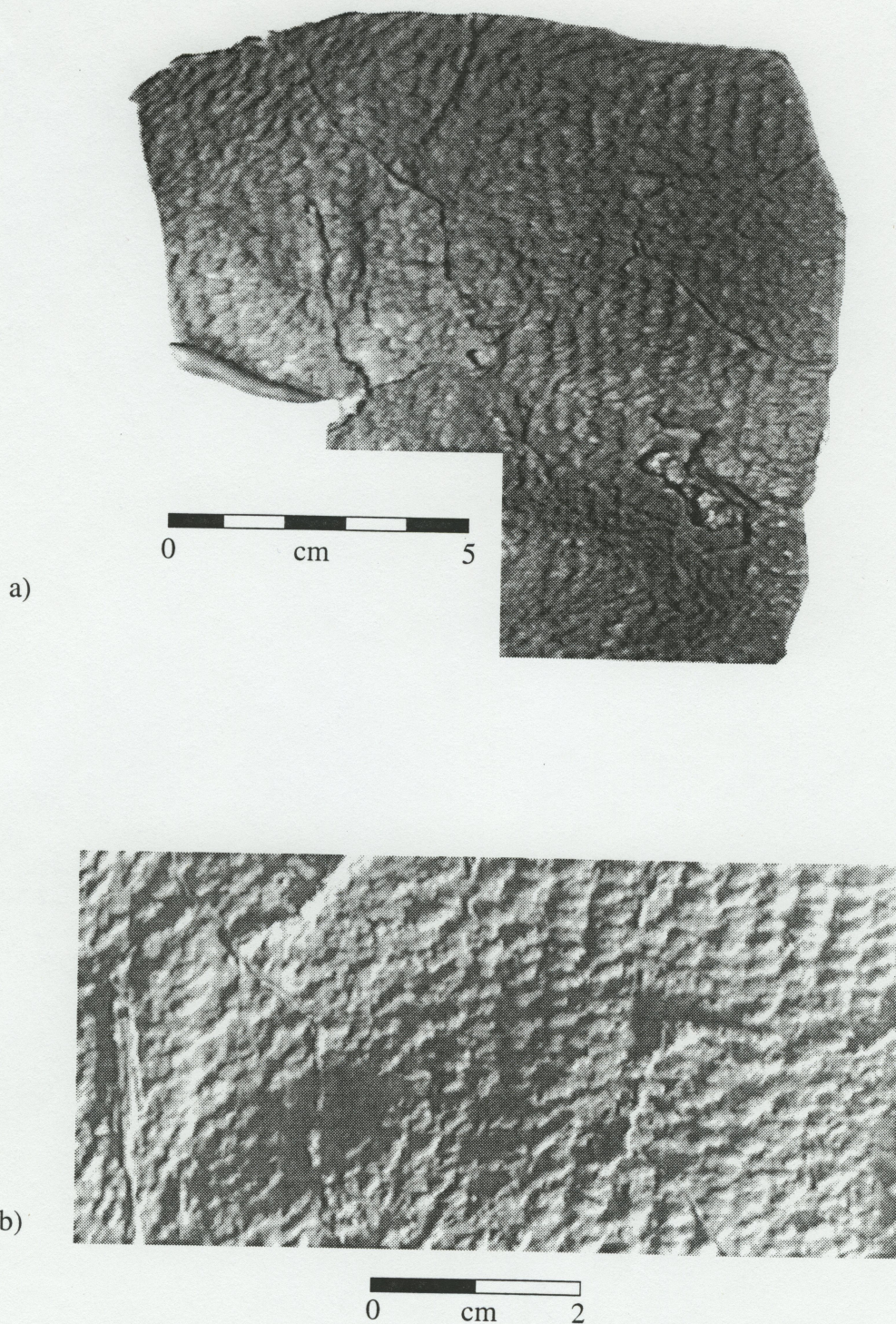


Figure 6.5. Impression (HfLp-11, Vessel 1) showing Z-plyed yarns worked in a S-twining twist. (a) Actual impression. (b) Detail.

If the ply twist counters the twining twist, it is quite probable that the yarn plies were originally spun more tightly.

Overall, the average diameters of warp yarns are slightly smaller than weft yarns (Table 6.2). The mean diameter for observed warp yarns is 2.37 mm versus 2.68 mm for weft elements. The range in diameter size for weft elements is also slightly larger than the warp elements. The minimum range for both warp and weft elements is similar; however, the largest measurement for the coarser weft elements is one millimetre larger than the corresponding warp measurement. The preference for using larger weft elements can also be observed in the fact that although 77.8% of warp elements measured are larger than two millimetres 86.2% of weft elements have diameters two millimetres or greater.

None of the examined yarn structures would constitute fine yarns as all are over one millimetre in diameter. However, with the exception of wear and loosely spun plies, yarns appear to be uniform within most of the examined structures.

6.3.3 Fabric

Textile structures could be identified for 29 of the 35 analyzed impressions (Table 6.3). This represents approximately 83% of the total sample. The only textile structure observed which could be identified is twining. Three variations could be determined: spaced twining, compact twining and weft-faced twining (Figure 6.6). All the twined impressions have weft elements twisted together in the S direction. It was not always clear which structure best fit the definition for some examples. Some spaced twining examples border on what is considered compact twining and it is not always possible to distinguish some compact twining from

Table 6.3 Textile structure frequencies of Kame Hills sample

	Count	% of Total
<i>Twining</i>	29	82.86
Spaced	5	14.29
Compact	16	45.71
Weft-faced	8	22.86
<i>Structures unknown</i>	6	17.14
Weft-faced	1	2.86
Indeterminate	5	14.28
Totals	35	100.00

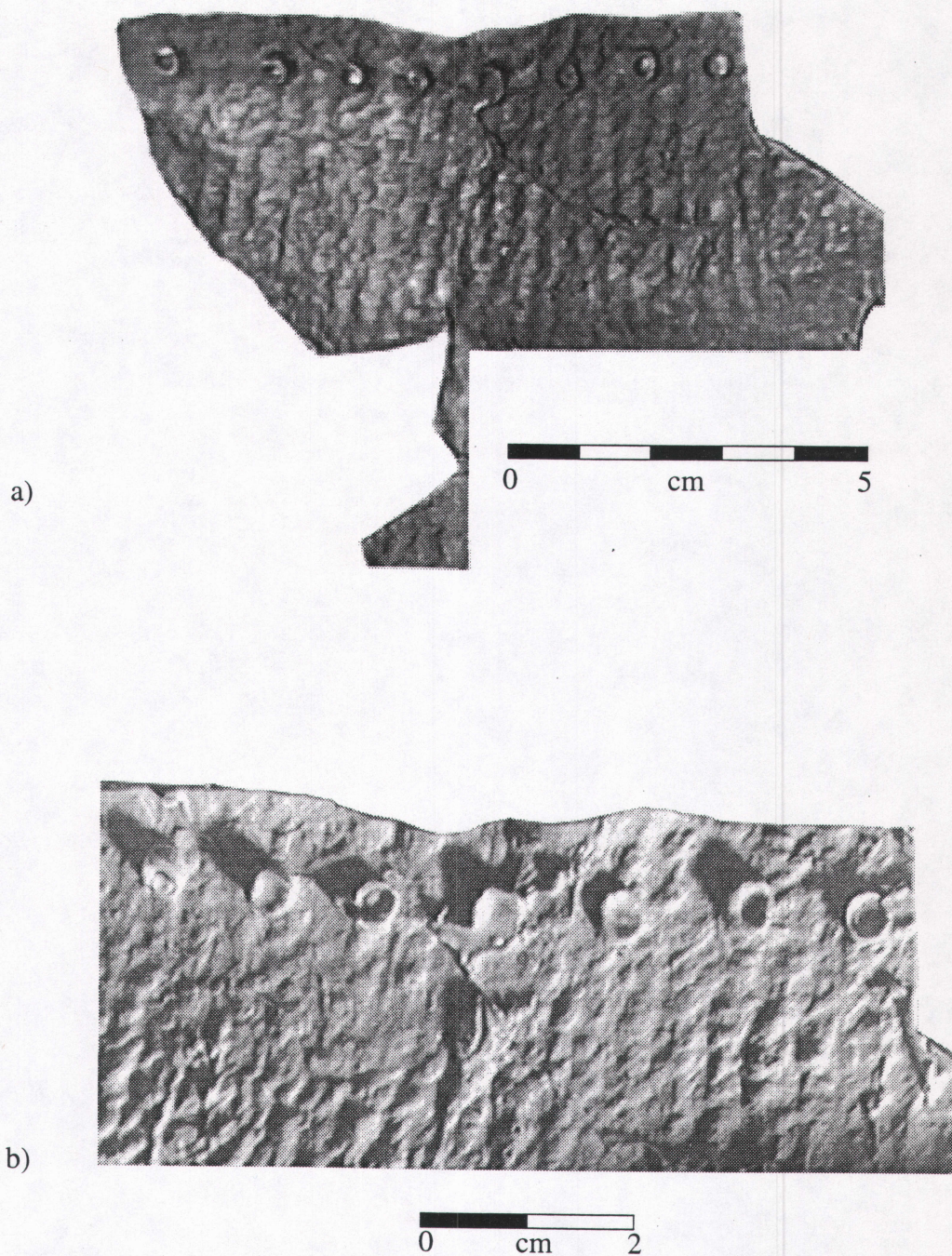


Figure 6.6. Example of compact twining structure (HiLp-3, Vessel 8)
(a) Actual impression. (b) Detail.

weft-faced twining. As mentioned earlier, weft-faced structures are defined on the basis that warp elements are completely obscured from view by the encircling weft elements.

Spaced twining is present on five (14.29%) of the identifiable impressions. As mentioned previously, the twining twist for all Kame Hills examples is an S-twist. The spacing between twining rows for this structure varies from 2 mm to more than 6 mm. Although, it appears that plain twining is represented in all the spaced twined examples, it was not always easy to discern whether some may have additional structures. In the analysis, it was not certain whether a pattern created by diverting warp strands, could have been represented on two impressions. Because there is no observed continuity to the pattern, it was assumed the strands were the result of wear. Drooker (1992:104) notes that when analyzing small sherds it is not always possible to discern the entire sequence, or if the observed pattern was a planned design rather than the result of sloppy construction or worn and missing elements. Identifying structures is also hampered by impressions which portray smoothed, overlapped and bunched textile structures.

Three of the spaced twined impressions have both warp and weft elements which are under two millimetres in diameter. These finer yarn structures are found only on the interior impressions of represented vessels. The warp elements for these interior impressions range from 1.5 mm to 1.6 mm in diameter and the weft elements range from 1.6 mm to 1.7 mm in diameter. The exterior impressions, on the other hand, have warp element diameters of 2.3 mm and 2.9 mm with weft element diameters measuring 3.2 mm and 3.3 mm. It seems apparent that there

was a preference for certain yarn sizes when considering the placement of spaced twined fabrics in the pottery production process.

When only one side of the fabric is visible, it is difficult to determine if two- or three-strand twining structures are represented. It was assumed that the spaced twining structures were constructed using two weft strands. On one interior impression (Figure 6.7), however, a braided weft structure was observed on the upper left corner. The weft elements appear to be worn away from the frayed warp strands, exposing a braid. This type of structure is created when three wefts interweave with each other before they twine with the warp (Samuel 1987:32).

One other interior impression may have been constructed using a similar technique (Figure 6.8). Braided twining, however, can be confused with another technique called three-strand twining. In three-strand twining, the three strands are not interlaced with each other before twining around the warp; rather, one strand simply passes over or under the other two and then behind the next free warp end (Samuel 1982:99). Each of the three strands in both twining and braiding travels over two warp ends and under one. It was this trait that was observed on this interior impression. The only way to determine which technique is used is to compare the angle the weft element creates on the back of the fabric with that on the front. If the angle lies in opposition to the slant of the row on the front, the row is braided (Figure 6.9) (Samuel 1982:99;1987:32).

The number of weft elements represented on the remaining spaced twining structures were tentatively assigned to the two-strand twining

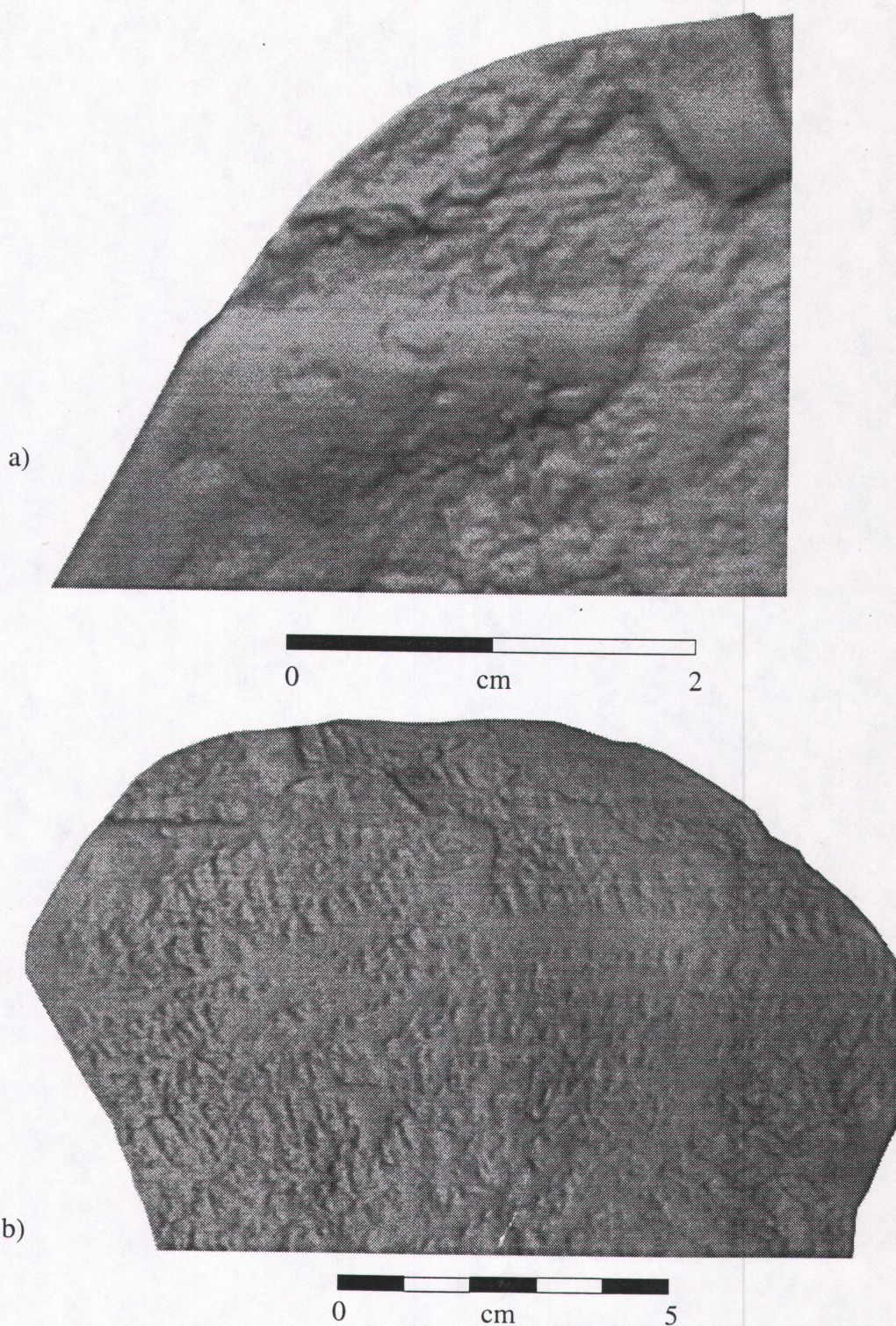


Figure 6.7. Interior impression (HcLv-6, Vessel 4) with braided weft elements. (a) Close up of braided element. (b) Portion of interior impression at actual size.

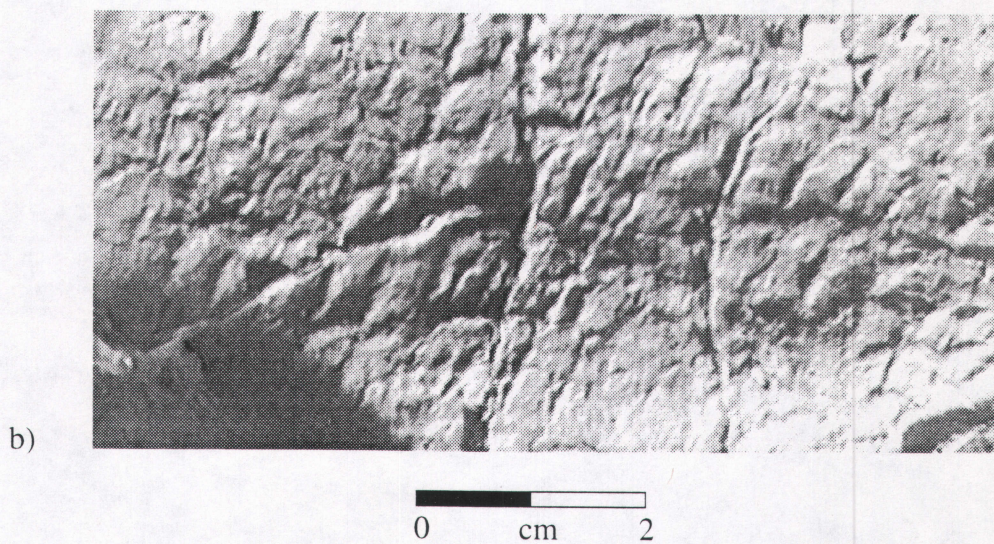
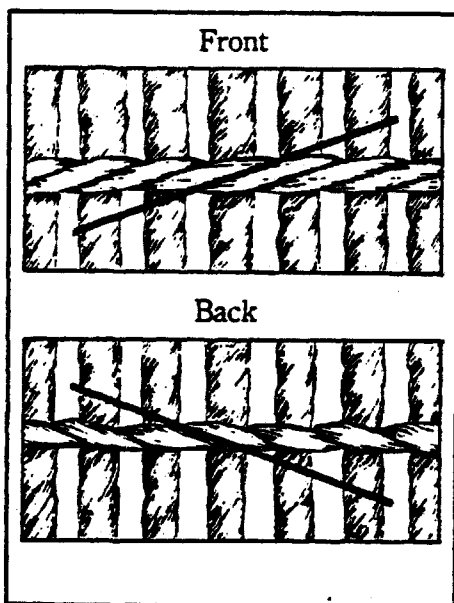
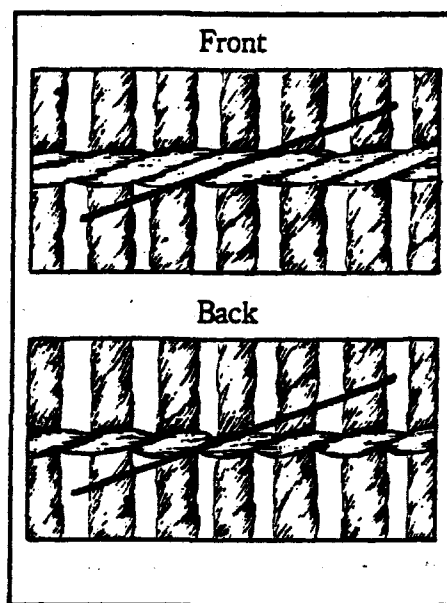


Figure 6.8. Interior impression (HiLp-3, Vessel 3) with three-strand twining structure. (a) Actual impression. (b) Detail.



braiding



three-strand twining

Figure 6.9. Twining angle for three strand twining structures (from Samuel 1982:99).

structure. Because the number of twining elements could not be determined, they were arbitrarily assigned to the minimal number used in twining structures.

Sixteen impressions or 45.71% of the sample exhibit compact twining structures (Table 6.3). All examples were produced using an S-twining twist. The minimal measurements for both warp and weft element are similar; however, the range for weft elements is slightly larger (Table 6.4). Ninety-two per cent of observable warp elements for compact twining are over two millimetres in diameter. All the weft elements have diameters greater than two millimetres. This indicates that relatively coarse fabrics were constructed using this technique.

There are eight examples or 22.86% of the Kame Hills sample which are represented by weft-faced twining structures. Because warp elements are completely obscured by the weft rows, information could be obtained for only some of the structural attributes. Six impressions or 86% of the weft elements of weft-faced twining structures have diameters greater than 2.5 mm. The average weft diameter, however, is not quite as wide as that found in the compact twining structures. This may be due to the density of the twining rows created by weft-faced structures.

Six impressions have structures which could not be identified. Five are structures found on the exterior surfaces of vessels and one on the interior surface of a vessel. The interior impression is from a vessel from the Kame Hills site (HiLp-1). The structure could not be identified in part because the vessel surface had been smoothed. As noted for the other interior impressions, the impressed textile also appears layered and

Table 6.4 Summary of Kame Hills fabric attributes by textile structure category

	min.	mean	max.	no. cases
<i>Spaced Twining</i>				
(5 samples)				
Warp diameter, mm	1.5	1.98	2.9	5
Weft diameter, mm	1.6	2.30	3.3	5
Warp twist category	1.0	2.00	3.0	4
Weft twist category				0
Warp elements per cm	2.0	2.84	4.0	5
Weft elements per cm	2.0	4.20	6.0	5
Weft rows per cm	1.0	1.90	3.0	5
Fabric count	4.0	7.04	10.0	5
Warp density	4.8	5.30	6.0	5
Weft density	3.2	4.26	8.0	5
Total density	8.2	9.56	13.1	5
Complexity Index No.1	2.0	3.00	4.0	5
Complexity Index No.2	3.5	4.13	4.0	4
Complexity Index No.3	4.5	6.13	8.0	4
<i>Compact Twining</i>				
(16 samples)				
Warp diameter, mm	1.9	2.52	3.1	13
Weft diameter, mm	2.0	2.80	4.1	16
Warp twist category		2.00		1
Weft twist category	1.0	1.33	2.0	6
Warp elements per cm	1.5	2.22	3.0	16
Weft elements per cm	4.0	6.01	8.0	16
Weft rows per cm	2.0	3.01	4.0	16
Fabric count	5.5	8.23	10.5	16
Warp density	4.2	5.80	7.8	13
Weft density	6.0	8.24	9.5	16
Total density	12.0	13.93	17.1	13
Complexity Index No.1	3.0	3.13	4.0	16
Complexity Index No.2	4.0	4.56	5.5	8
Complexity Index No.3		6.00		1

Table 6.4 Summary of Kame Hills fabric attributes by textile structure category (continued)

	min.	mean	max.	no. cases
<i>Weft-faced Twining</i> (8 samples)				
Warp diameter, mm				0
Weft diameter, mm	1.8	2.69	3.3	7
Warp twist category				0
Weft twist category	1.0	1.75	3.0	4
Warp elements per cm	1.7	2.46	4.0	8
Weft elements per cm	5.4	6.37	8.0	7
Weft rows per cm	2.7	3.19	4.0	7
Fabric count	7.1	8.90	10.5	7
Warp density				0
Weft density	5.4	8.07	10.0	7
Total density				0
Complexity Index No.1	3.0	3.29	4.0	7
Complexity Index No.2	4.5	4.70	5.5	5

distorted making identification very difficult. The textile observed on this sample is not a densely constructed fabric. This is a quality also shared by the other interior impressions which reveal well spaced twining structures. The strands employed in producing the textile measure approximately 2.4 mm in diameter. This measurement, however, is slightly larger than those obtained from the other interior impressions. Based on the comparable data, it is possible that spaced twining is the represented structure. Regardless of structure identification, there seems to be a conscious decision in the pottery manufacturing process to employ open structures for the interior of vessels.

Unfortunately, the structures observed on the two cup impressions could not be identified. The cups represent vessels from two sites, the Kame Hills site (HiLp-1) (Figure 6.10) and Fire Island site (HfLp-11) (Figure 6.5). Although the textile structures for the two vessels could not be identified, the vessels share similar characteristics. The textile impressions on both cups are shallow and have been smoothed. The cup from HiLp-1 has strands which measure 1.8 mm in diameter, whereas the cup from HfLp-11 has strands with a diameter of 1.9 mm. The textile structures appear similar on both vessels and are not densely constructed. The structures do not appear to have the two elements found in twining or woven structures. Both impressions exhibit thin, linear strands which run perpendicular to the rim of the cups. Knots, associated with netted structures, were not observed. It is possible that a form of interlinking was employed; however, the impressions are too faint to determine this with certainty.



Figure 6.10. Cup (HiLp-1, Vessel 25) with unidentifiable textile structure. (Courtesy of the Manitoba Museum of Man and Nature.)

An exterior impression of a vessel from the Bruce Taite-Vernon Anderson site (HjLw-1) also exhibits an unknown structure (Figure 6.11). The elements are oriented perpendicular to the rim and the yarn diameter averages 2.1 mm. The vessel section has a boss; therefore, the structure is found on the neck/rim region. Given this location, it is possible that the unknown textile could represent a distorted twining structure.

A structure found on a vessel from HfLp-7 is very striking. It has a weft-faced structure (Figure 6.12) comprised of well constructed **Z**-twist yarn elements. Although it appears similar to the twined examples, there is no evidence of warp elements.

The structure observed on one impression is completely indecipherable. This is from a pot recovered from HiLp-1. Although the elements measure 2.5 mm in diameter, their orientation to the rim is unknown and no information could be derived from the impression itself. The structure appears to be compact but is not as dense as that observed on weft-faced impressions.

6.3.4 Fabric Count and Density

Fabric count may assist in determining how much time was invested in producing a textile. As mentioned in Chapter 2, the higher count fabrics require more time to construct than those with lower counts. Table 6.2 indicates that the ranges for all measured warp and weft elements per centimetre are similar.

Spaced twining has the lowest mean fabric count and weft-faced twining has the highest (Table 6.4). It should be noted that three-strand twining will influence the weft measurements of the spaced twining

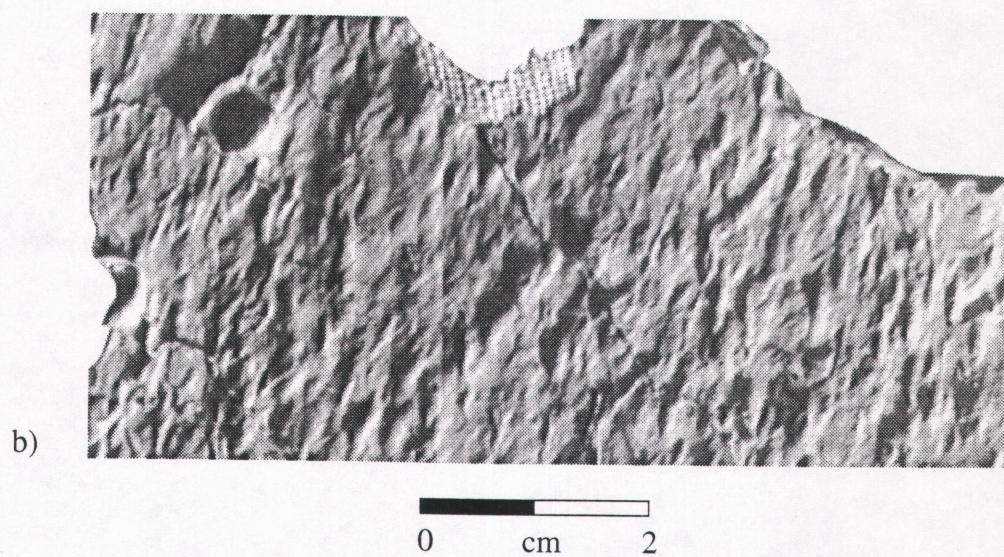


Figure 6.11. Example (HjLw-1, Vessel 12) of unidentified textile structure. (a) Actual impression. (b) Detail.

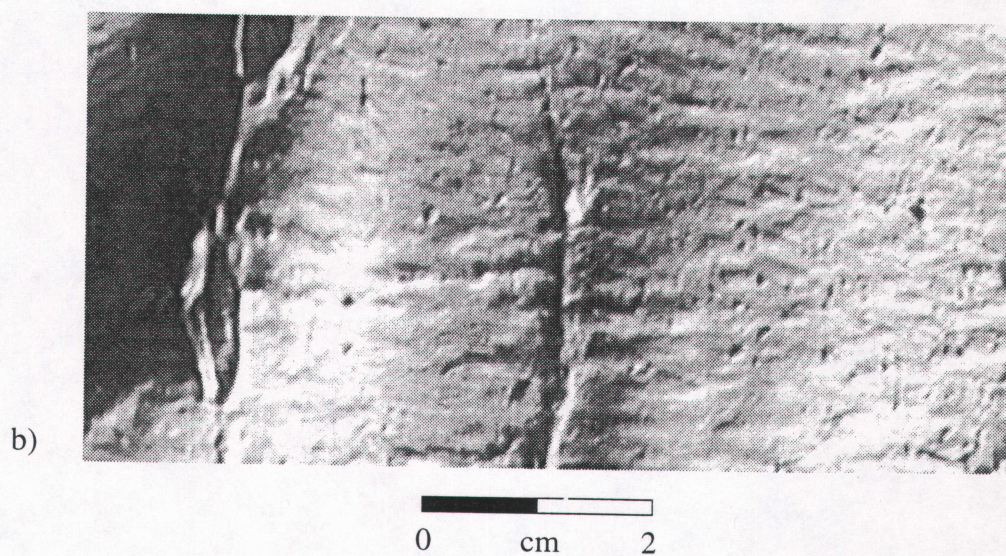
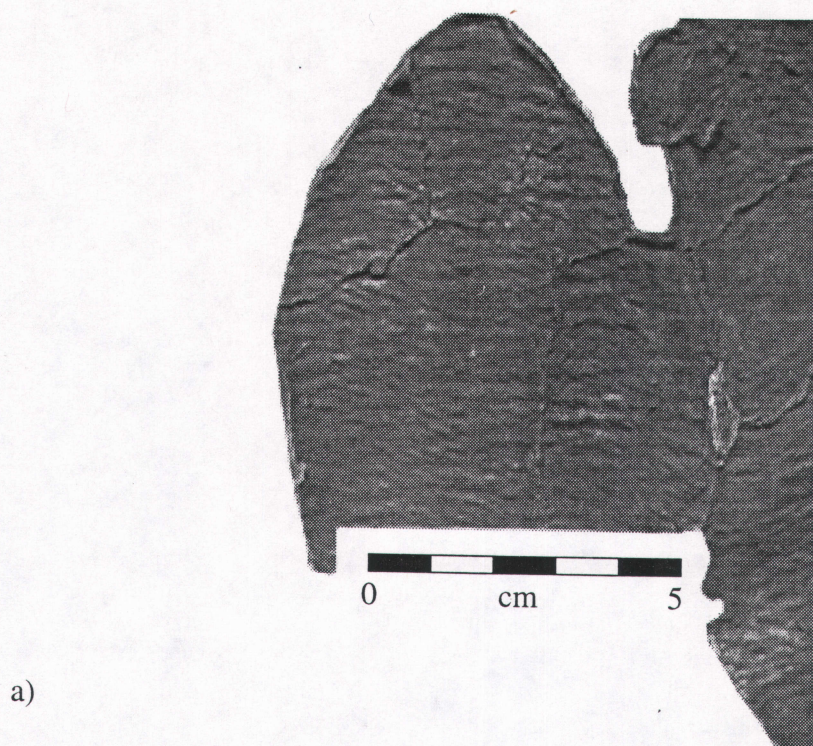


Figure 6.12. Unidentified weft-faced structure (HfLp-7, Vessel 127).
(a) Actual impression. (b) Detail.

structures and increase the fabric count for that structure. Table 6.4 shows that weft-faced twining structures have a narrower fabric count range than that observed for spaced and compact twining structures. This indicates that the fabrics created by weft-faced structures were very similar. Also, there are consistently more wefts per centimetre than warps per centimetre for the weft-faced structures.

Fabric counts of all measurable samples range from 4.0 to 10.5 elements per square centimetre. Very fine textiles having fabric counts greater than 15 do not occur in this sample. Twenty-six (90%) of the twined impressions have fabric counts which are 10.0 or less. Since the fabric count for modern burlap is 9.6, it seems evident that coarser textiles are represented in this sample.

The density of a fabric indicates the amount of visual opacity (Drooker 1990:171). Total densities for all twined Kame Hills textiles range from 8.2 to 17.1 (Table 6.2). Densities, however, vary between structural categories. Total densities could not be obtained from the weft-faced structures as warp measurements could not be obtained from the sample. The average total density for compact twined structures is higher (13.93) than that measured for the spaced twined samples (9.56). Therefore, it is assumed weft-faced structures would have higher densities than those found for compact and spaced twining structures.

Warp densities are higher than weft densities for spaced twined structures. This reflects the fact that the fabrics were constructed with widely spaced weft rows (Drooker 1990:171). The reverse is true for the compact and weft-faced twined fabrics. It is possible that some examples

of compact twining are structurally closer to weft-faced twining and this is reflected in the densities.

6.3.5 Textile Production Complexity

Modified Complexity Index No. 1 involves measuring fabric count and number of employed structural techniques. It could be calculated for 28 impressions. The mean Modified Index No.1 value for Kame Hills textiles is 3.14. This is very close to that found for modern burlap which has the Index value of 3.00 (Drooker 1989:151, 1990:213).

The Modified Index No.2 includes the measurements of Index No.1 plus the average number of elements which make up a yarn. Although yarn plies could be observed on 14 impressions, these represent weft elements only. It can only be assumed that warp elements were constructed in a similar manner. Historic examples of twined bags from the Great Lakes indicate that there was a preference for the use of unspun or spun nettle and basswood fiber for warps and respun trade wool for weft elements (Densmore 1929:158; Lyford 1942:81; Whiteford 1991:75). It is not known if the preference for using different materials for each structural element extended from pre-contact times. Lacking observable data for these warp elements, they were arbitrarily set at one and an average yarn ply was determined from the difference. The designated values, therefore, are the minimal values which could be represented.

Values for Index No.2 were calculated for 17 impressions and range from 3.5 to 5.5. The mean, 4.53, is slightly higher than the 4.00 value for burlap (Drooker 1989:151, 1990:213). The mean values differed between structural categories. The Index No.2 value for spaced

twining was the least, whereas the mean value for weft-faced twining was the highest (Table 6.4). This indicates more time is invested in constructing the densely structured textiles.

Complexity Index No.3 adds the number of warp twist per category to the previous indices. This was calculated for only five structures; four spaced twining impressions and one compact twining impression. The mean value for all measurements is 6.10. The mean Index No.3 value for the spaced twining is slightly higher (6.13) than that obtained for the compact twining sample (6.00). For comparison, burlap has an Index No.3 value of 6.00 as well (Drooker 1989:151, 1990:213).

6.3.6 Fabric Wear and Manipulation

Wear is indicated on some Kame Hills impressions by structures which have missing or distorted elements. Five impressions show textiles with missing or frayed elements. Others exhibit distorted elements where the textile appears damaged but not pulled apart. One interior impression from HcLv-6 has frayed elements where the weft elements have been separated from the warp elements (Figure 6.7). Four other impressions show evidence of missing elements. One vessel, from HfLp-12, is represented by an impression which appears so worn it is difficult to determine if one or two structures are represented.

Unfortunately, the impression (Figure 6.13) has been smoothed so much, it is difficult to determine if the textile is missing many elements or if a twined structure has been overlaid with another structure comprised of linear parallel strands.

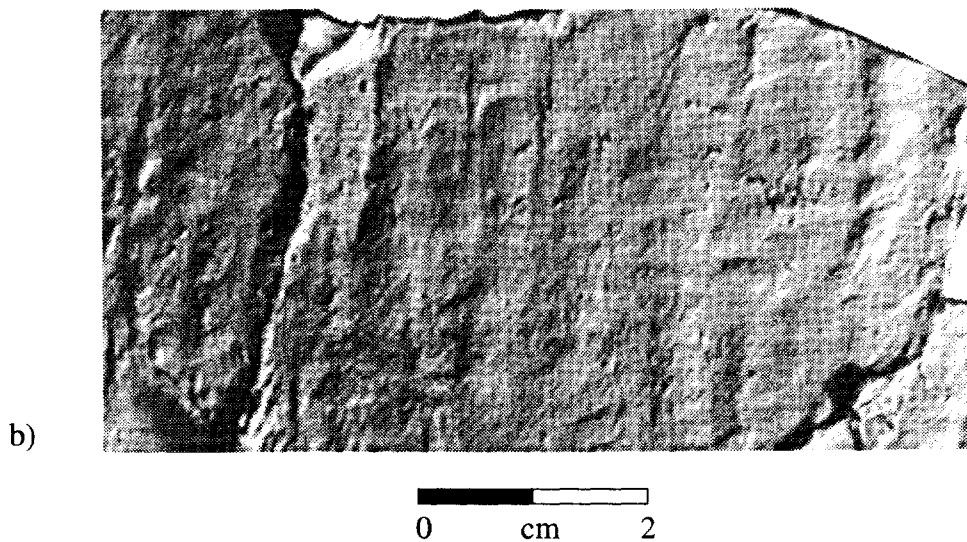
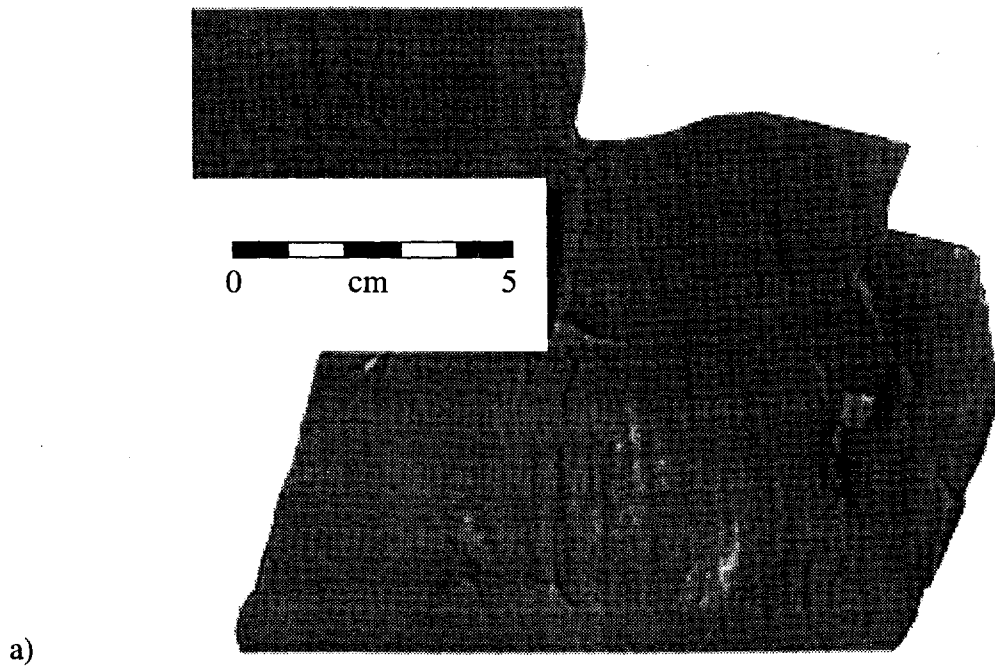


Figure 6.13. Smoothed impression (HfLp-12) with missing elements.
(a) Actual impression. (b) Detail.

Twelve impressions (41.38% of identifiable structures) exhibit distorted structures. Two vessels, one from HfLp-7 and the other from HjLw-1 (Figure 6.14), have textile impressions which appear "scrunched" at the neck region of the vessels. Three of the interior impressions also indicate some bunching up of the utilized textiles. In contrast, seven exterior impressions show distorted weft elements which are pulled upwards as if the represented textiles had stress placed on them. This type of distortion is visible on four rim sections and on three body portions.

The condition of textile structures from eight impressions could not be determined because the vessel surfaces were so smoothed that fine details were obscured. Impressions from two vessels also exhibit areas where the vessel surface had been exfoliated. Wear could not be determined from the fragmentary information obtained from these impressions.

Drooker (1989:226) found that there was no correlation between the fabric condition and the fabric scale of Wickliffe textiles. However, for Kame Hills textiles, the distorted structures with elements pulled out of place are represented only by compact and weft-faced textiles with fabric counts between 7.9 and 8.5. The structures with missing elements are represented by textiles with fabric counts between 8.5 and 10.0. It appears that there was a preference for coarser fabrics when stress was to be applied to the textile structure.

Overlapping of fabrics was noted on 17 impressions. Layering occurs on three interior impressions where one structure completely covers the other structures which are observable beneath the surface

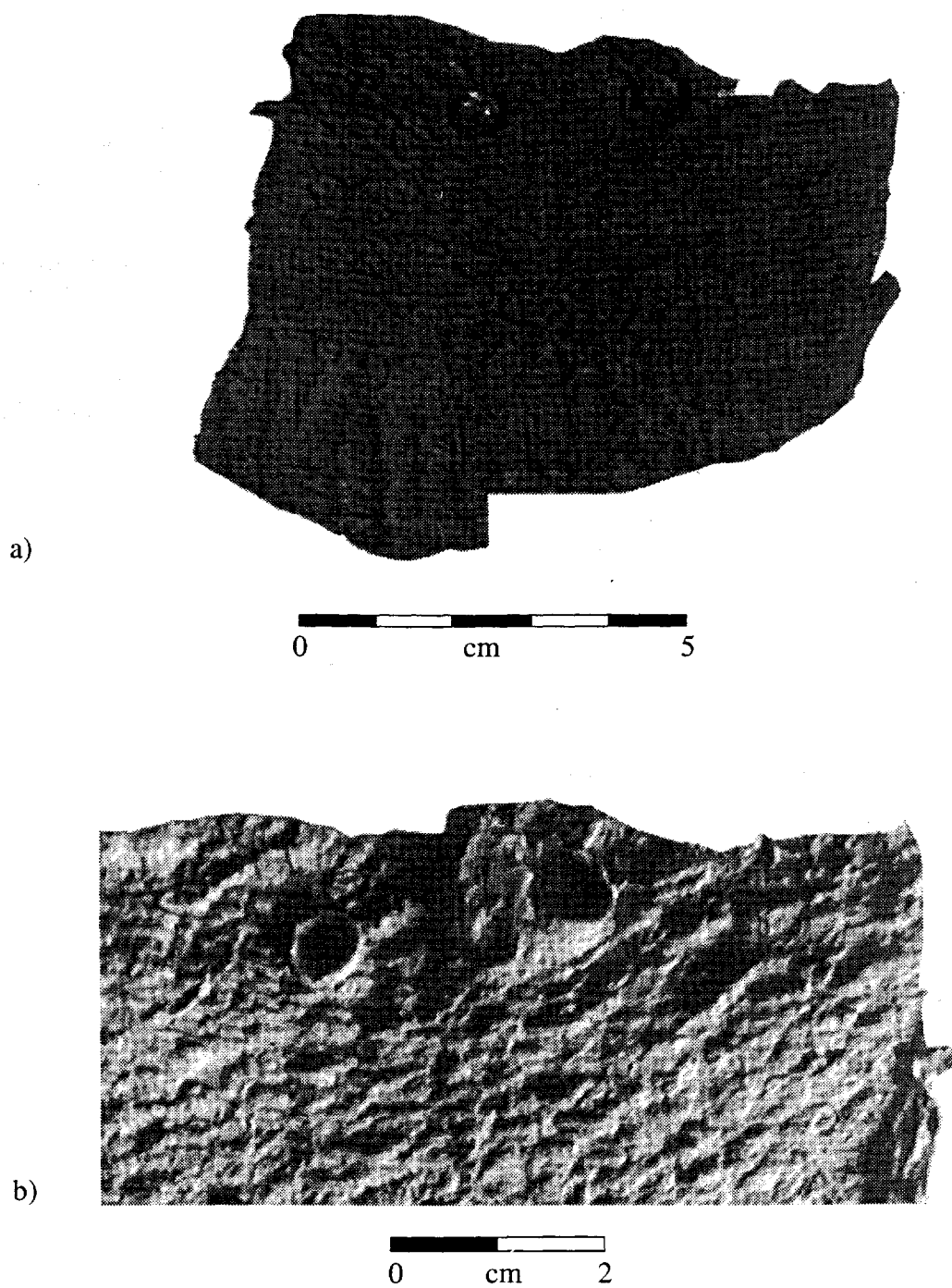


Figure 6.14. Example of an impression (HjLw-1) with textiles bunched below punctate row. Note piceated incised lines along shoulder. (a) Actual impression. (b) Detail of bunched textiles.

structure. It is not known if the textiles underneath are the same as those on the surface. Overlapping is evident on the remaining impressions by fabrics oriented at different angles. The structural characteristics of the overlaid fabrics are the same suggesting they might represent a folded piece of the same fabric (Figure 6.15). Overlapping can be observed on two plate impressions and on 12 body and/or basal portions of vessels. No rims exhibit overlapping fabrics.

Because different vessel forms are represented, it was important to note the orientation of textiles on the vessels in order to determine the continuity of the pottery manufacturing process. Kame Hills pottery has textile impressions which extend up to the rim. Characteristically, the rims have been smoothed to varying degrees. However, the rims were not smoothed any more than the body portions.

Orientation of fabric relative to the rim was recorded for 22 impressions. Of eight pot rims examined, all have twined structures with the warp yarns situated perpendicular to the rims. Eight body portions exhibit similar characteristics with warp elements perpendicular to the rim. The same is true for the twining structures observed on the bowl impression. One of the larger impressions produced from a plate reconstruction exhibits warps running perpendicular to the rim, as well. Interestingly, overlapping appears near the centre of the plate which may have been done in order to get the proper alignment of fabric to the rim.

Orientation on two interior impressions could also be discerned. Interior impressions from two pots show warp elements perpendicular to the rim edge. It is not known if the layers observed underneath these surface structures exhibit similar orientation.

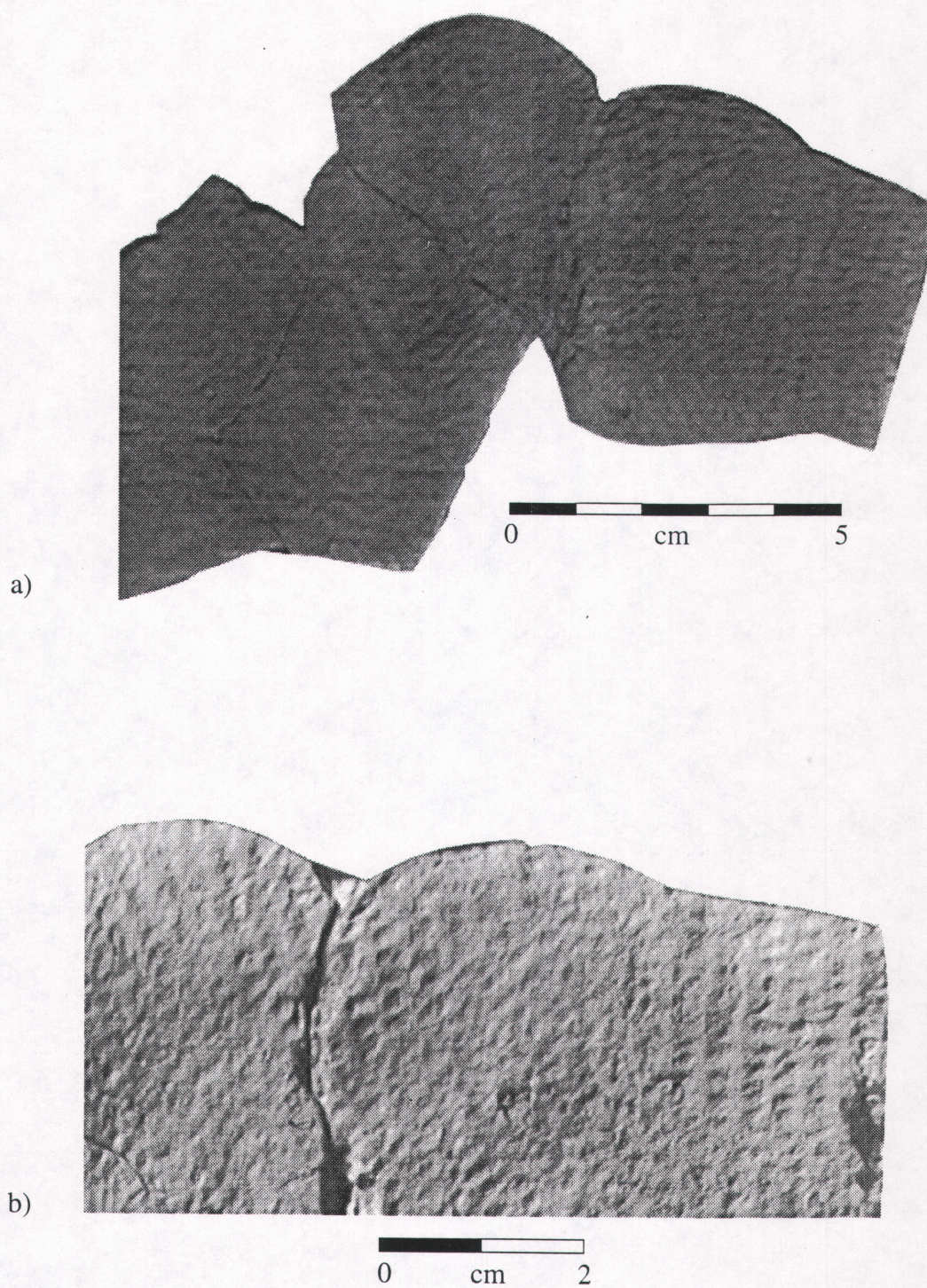


Figure 6.15. Impression (HiLp-1, Vessel 29) which exhibits overlapping twining structure. (a) Actual impression. (b) Detail.

The impressions from the two cup examples also show distinct patterning with regard to orientation of textile relative to rim. Although the structures used to impress these small vessels could not be identified, they consist of thin, linear strands that run perpendicular to the rim. The structures may be different than the observed twining structures; however, the effect is the same.

6.3.7 Correlation Between Vessel Type and Textile Characteristics

Textile attributes, as well as the characteristics of the textile-impressed pottery, must be taken into account in order to determine whether vessel size and shape determines the type of textile employed for its construction. Table 6.5 illustrates the attributes measured for each vessel type. Because the textile structures for the cups could not be identified, attributes for these structures could not be measured. The elements have been described, however, and represent open constructed textiles as opposed to the more compact twining structures used in the manufacturing of the larger vessels.

Textiles used in pot production show a broader range of yarn sizes than those used for making bowl and plates. This may indicate that textiles made of finer yarns could be used to manufacture pots whereas coarser textiles were predominantly employed for bowls and plates. It may also indicate that the sample numbers are too small to determine any trends. The impressions representing bowls and plates have average yarn sizes of 2.60 mm and 2.75 mm respectively. Sixty-eight per cent of the yarn diameters used in the twining structures for pot exteriors are between 2.0 mm and 2.9 mm. This suggests that the majority of textile

Table 6.5 Summary of Kame Hills fabric attributes in relation to vessel form

	min.	mean	max.	no. cases
<i>Pots (exterior)</i>				
(25 samples)				
Warp diameter, mm	1.9	2.31	3.1	12
Weft diameter, mm	1.8	2.80	4.1	22
Warp twist category	1.0	1.50	2.0	2
Weft twist category	1.0	1.57	3.0	7
Warp elements per cm	1.5	2.25	4.0	22
Weft elements per cm	4.0	6.03	8.0	21
Weft rows per cm	2.0	3.01	4.0	21
Fabric count	5.5	8.29	10.5	21
Warp density	4.2	5.52	7.8	12
Weft density	5.4	8.36	10.0	22
Total density	12.0	13.70	17.1	12
Complexity Index No.1	3.0	3.19	4.0	21
Complexity Index No.2	4.0	4.64	5.5	11
Complexity Index No.3	5.5	5.67	6.0	3
<i>Pots (interior)</i>				
(4 samples)				
Warp diameter, mm	1.5	1.57	1.6	3
Weft diameter, mm	1.6	1.67	1.7	3
Warp twist category	2.0	2.33	3.0	3
Weft twist category				0
Warp elements per cm	3.0	3.33	4.0	3
Weft elements per cm	4.0	4.67	6.0	3
Weft rows per cm		2.00		3
Fabric count	7.0	8.00	10.0	3
Warp density	4.8	5.20	6.0	3
Weft density	3.2	3.33	3.4	3
Total density	8.2	8.53	9.2	3
Complexity Index No.1	2.0	2.33	3.0	3

Table 6.5 Summary of Kame Hills fabric attributes in relation to vessel form (continued)

	min.	mean	max.	no. cases
<i>Plates (exteriors)</i>				
(3 samples)				
Warp diameter, mm	2.6	2.75	2.9	2
Weft diameter, mm	2.5	2.77	3.3	3
Warp twist category		1.00		1
Weft twist category		1.00		1
Warp elements per cm	2.0	2.33	2.5	3
Weft elements per cm	2.0	5.07	7.2	3
Weft rows per cm	1.0	2.53	3.6	3
Fabric count	4.0	7.40	9.7	3
Warp density	5.8	6.15	6.5	2
Weft density	3.3	5.63	7.5	3
Total density	9.1	11.55	14.0	2
Complexity Index No.1	2.0	2.67	3.0	3
Complexity Index No.2		4.50		2
Complexity Index No.3		5.50		1
 <i>Bowl (exterior)</i>				
(1 sample)				
Warp diameter, mm		2.60		1
Weft diameter, mm		2.60		1
Warp twist category				1
Weft twist category		2.00		1
Warp elements per cm		3.00		1
Weft elements per cm		6.00		1
Weft rows per cm		3.00		1
Fabric count		9.00		1
Warp density		7.80		1
Weft density		7.80		1
Total density		15.60		1
Complexity Index No. 1		3.00		1
Complexity Index No.2		4.50		1

structures used in pot construction fall within similar ranges as those found in the representative plate and bowl samples.

The three impressions representing plates are constructed from spaced, compact and weft-faced twining structures. Although the majority of pot exterior impressions exhibit weft-faced and compact twining structures, there is one sample which is spaced twined. The one bowl impression exhibits a compact twining structure.

It is intriguing that there are the twining structures observed on the interiors of vessels. The textiles are of open construction and three are identified as spaced twining structures. The yarn diameters are also thinner than those found on any other vessel type. Fabric count and densities are also much smaller.

Correlation can be made with regard to placement of textiles. Although structurally similar, interior impressed textiles differ significantly from those used to impress the exteriors. This is evident by the chosen yarn sizes and the structural variations.

Correlation between vessel size and textile characteristics is evident to a degree. It is not clear what the extent of variation is between the larger vessel types, such as pots, bowls and plates. More examples are necessary in order to draw better conclusions. Variation does exist between the larger vessels and the smaller ones, such as the cups. This is evident in yarn size and possible structural differences.

6.4 Summary

Textile-impressed Selkirk pottery is found throughout the Kame Hills region. Thirteen sites from various locations within the Southern Indian Lake area are represented in this study. Unique vessel forms and twining variations were observed in these samples. Although various structures are evident, these are found throughout the study region. This reflects a strong cultural continuity among site locations. From these observations, choice of textile structures and yarn construction could be correlated to vessels size. Larger yarns used to construct denser textile structures were employed in large vessel production. Small vessels, such as cups, were manufactured from open structured textiles made of finer yarns. Correlations could also be made regarding type of textile employed and its placement on a vessel. Spaced twining structures were generally found on the interior impressions of vessels, whereas the more densely constructed twining structures were found on the exterior impressions. The textiles found on Kame Hills impressed pottery were generally positioned with the warp rows perpendicular to the rim of the vessel. This appears to be a reoccurring trait of Selkirk pottery.

CHAPTER SEVEN

7.0 SUMMARY AND DISCUSSION

7.1 Introduction

This chapter presents the findings of the last two chapters in order to compare the textile attributes found in both the Pehonan/Keskatchewan and Kame Hills complexes. The chapter is divided into two parts. The first part presents regional comparisons of observed textile structures in order to define the similarities and differences between the two complexes. The second part discusses issues presented in Chapter 2 which focus on the characteristics of the impressed textiles and their relationship to pottery manufacture.

7.2 Regional Comparisons

The Pehonan/Keskatchewan and Kame Hills complexes belong to the Selkirk composite and therefore, share a similar material culture. By analyzing the textiles impressed on the respective regional pottery, it is believed that additional cultural similarities can be identified. Although the entire range of textiles used by these groups is not known, important comparisons can be made on the basis of the textile structures present on the pottery. Those textile attributes which are consistent between the two

complexes are useful for characterizing textiles belonging to the Selkirk composite as a whole. Drooker (1989:300-301) cautions, however, that even if samples of textile-impressed pottery from given sites:

adequately represent the actual populations of textiles impressed on pottery -- which the samples may not -- dissimilar groups of textiles from separate locations may or may not reflect different textile-making traditions. Rather, they may merely indicate different criteria in choosing textiles for use in pottery production.

By definition, some variability exists between the Kame Hills and Pehonan/Keskatchewan complexes, in pottery form and decoration as well as in textiles employed in pottery manufacture. The Pehonan/Keskatchewan pottery exhibits more Plains influences than the Kame Hills pottery and many of the Pehonan/Keskatchewan vessels have smoother surfaces than those observed for the Kame Hills pottery. Many Pehonan/Keskatchewan vessels also show more smoothing along the rim area before punctates were applied to the exterior surfaces.

The Pehonan/Keskatchewan vessels exhibit traits which indicate that two forming techniques were employed in the manufacturing process. Hanna (1983:31-37) describes this very thoroughly in her description of a vessel from the Bushfield West site (FhNa-10). The regular and continuous configuration of textile impressions on the vessels suggests molding. However, many of the Pehonan/Keskatchewan vessels also exhibit traits resulting from the paddle-and-anvil technique. For example, many commonly display numerous shallow concave impressions on the interior of the vessels.

These are created when a tool, such as a rounded stone, is held inside the vessel, opposite the point where it is hit firmly with a paddle (Rye 1981:84; Hanna 1983:31). This beating serves to compact the clay (making a harder vessel), to decrease vessel thickness and to increase vessel size (Hanna 1983:31).

Kame Hills vessels do not exhibit the paddle-and-anvil technique as consistently as the Pehonan/Keskatchewan pottery. As noted in Chapter 6, some vessels have interior textile impressions (Figure 7.1a). Two of these vessels also exhibit exterior textile impressions. The interior and exterior impressions represent two fabric types (compact twining on the exterior and spacing twining structures on the interior); the purpose of the interior impressions is uncertain. It is possible that the interior impressions were created as part of the molding process or were used to moderate the drying process. Other Kame Hills vessels exhibit roughly shaped interior surfaces (Figure 7.1b). It appears as though the clay had been pressed into a mold with very little or no smoothing of the vessel surface.

Many Kame Hills vessels show surface markings which Rye (1981:81) associates with mold-formed pottery. For the most part, these markings are different on the interior and exterior. The exterior side (mold side) has a uniform-textured surface and the interior shows attributes derived from the method of pressing. Drag marks occur on the pressed side when the interior surface is scraped to a uniform thickness. Like the Pehonan/Keskatchewan vessels, Kame Hills pottery was then smoothed to obliterate the textured exterior surface.

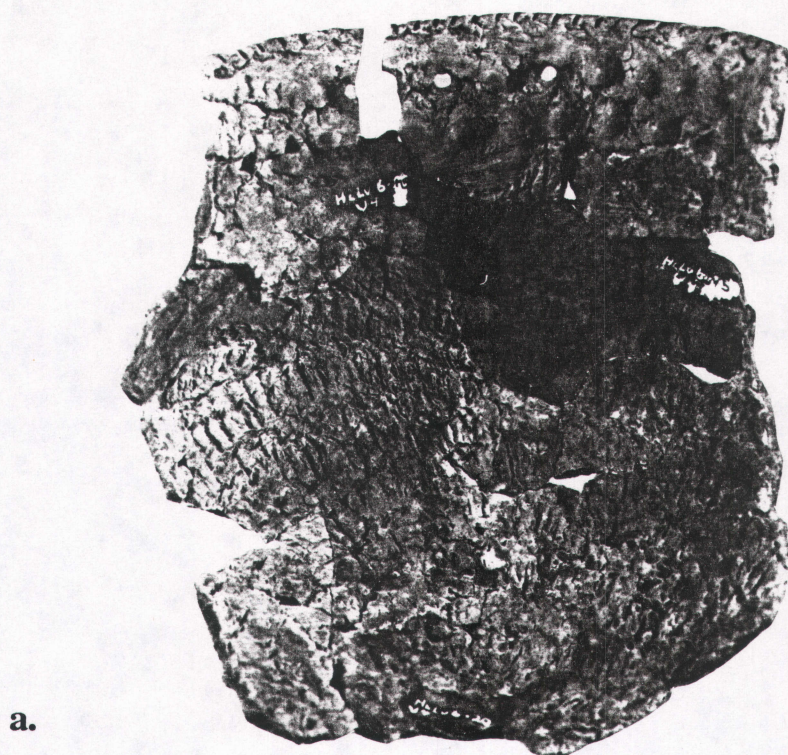


Figure 7.1. Observed interior treatments of vessels. (a) textile-impressed (courtesy of the Manitoba Museum of Man and Nature). (b) pressed or pinched (courtesy of Todd Paquin).

Twining was the most common textile structure identified on impressed pottery for the two complexes. It was found on textile-impressed vessels from all sites. Table 7.1 illustrates the twining attributes present on Selkirk pottery from both complexes. The most typical form of twining structure found in the two regions is compact twining. It is characterized by two active weft elements working together in a half turn twining twist in the S direction around a single warp strand. The only example of a Z-twisted twining structure is represented by a vessel from the Bushfield West site (FhNa-10).

Kame Hills textiles show a greater variety in twining structures. Although both Pehonan/Keskatchewan and Kame Hills impressed textiles are represented by compact twining and weft-faced twining structures, the spaced twining textiles observed on Kame Hills pottery are distinctive. The spaced twining examples exhibit a variety of structural variations not observed in the other two forms of twining techniques. A braided weft element was recognized on an impression from HcLv-6 and three stranded weft elements (possibly braided twining) are represented on an impression from HiLp-3. These structures indicate that pottery manufacture, at least in the Kame Hills region, utilized a greater range of available textiles.

The fabric count for both complexes ranges from 4.0 to 12.0 (Tables 5.2 and 6.2). The average fabric count is slightly higher for the Pehonan/Keskatchewan sample than the Kame Hills sample with means of 8.95 and 8.19 elements per square centimetre, respectively. The mean fabric density for Pehonan/Keskatchewan textiles is also greater than that of the Kame Hills complex. This is due to the inclusion of the

Table 7.1 Twining attributes present on Selkirk pottery

Characteristics	Pehonan/Keskatchewan Sample		Kame Hills Sample		Total Sample	
	No.	%	No.	%	No.	%
<i>Type</i>						
Spaced	0	0.0	5	17.2	5	12.2
Compact	8	66.7	16	55.2	24	58.5
Weft-faced	4	33.3	8	27.6	12	29.3
<i>Direction of Twining Elements</i>						
Warp	0	0.0	0	0.0	0	0.0
Weft	12	100.0	29	100.0	41	100.0
<i>Direction of Twining Twist</i>						
S	11	91.7	29	100.0	40	97.6
Z	1	8.3	0	0.0	1	2.4
<i>Number of Active Elements Working Together</i>						
Two	12	100.0	27	93.1	39	95.1
Three	0	0.0	2	6.9	2	4.9

spaced twining textiles. The average spaces between weft rows in the spaced twined structures range from 2.5 mm to 6 mm.

The attributes for all impressed textiles from both regions show similar characteristics (Tables 5.2 and 6.2). Most of the attributes for the Kame Hills impressed textiles appear to have a slightly larger range than those found in the Pehonan/Keskatchewan samples. Yarns of both the Pehonan/Keskatchewan and Kame Hills complexes are of a medium to coarse size range. All are greater than 1.5 mm. Only one warp diameter from the Kame Hills samples measures over 3 mm. However, weft element diameters show a greater range, from 1.6 mm to 4.1 mm. Three Pehonan/Keskatchewan impressions have weft diameters larger than 3.0 mm as do nine for the Kame Hills sample. The finest yarns were employed in the spaced twining textiles observed on Kame Hills pottery.

From the smoothed impressions, it is difficult to determine how much processing went into yarn construction. Plies could not be determined from the identifiable Pehonan samples and only 14 impressions from the Kame Hills samples can be determined to be made of two-ply construction. The direction and angle could be determined for 12 impressions. All, but one, have ply twists which are twisted to produce a **Z** slant. Two-ply yarns produced by thigh spinning are generally **Z**-twisted. In the spinning process, two single strands are spun simultaneously down the leg producing **S**-twisted yarns and are plied together up the leg to produce a **Z**-twisted two plied yarn (Drooker 1989:285-286; Samuel 1982:58-60).

Although plies could not be determined on Pehonan/Keskatchewan impressions, yarn twists were observed for six

impressions. In all observed cases, the yarns were twisted to produce an S slant. Yarn twists were observed for five warp strands in the Kame Hills samples. Unlike the Pehonan/Keskatchewan impressions, these were twisted to produce a Z slant. With one exception, all Pehonan/Keskatchewan and Kame Hills yarn structures have loose to medium twists (under 25 degrees). A single weft element from the Pehonan/Keskatchewan sample has a tight twist between 26 and 45 degrees. It is possible the yarn twist was also influenced by the S twining twist.

Several vessel forms are represented in the Kame Hills sample while the Pehonan/Keskatchewan sample is represented by only one pot form. In order to determine similarities and differences between complexes, comparisons of similar variables are necessary. Therefore, a comparison of attributes exhibited on pot exteriors is made in Table 7.2 which represents the attributes present on pot exteriors from both complexes. Table 7.3 lists attributes of modern burlap and serves as a reference for fabric attributes of the two complexes. Although the interlaced structure of burlap is different from the twining structures identified for the two Selkirk complexes, its attribute measurements are similar to those observed for the studied impressions. As noted earlier, the measurements for the impressed textiles are estimates and reflect the results of dried and fired clay vessels. The original measurements would have been somewhat larger.

Three (37.5%) of the measured warp elements for Pehonan/Keskatchewan structures are under 2 mm and four (22.2%) warp elements measured from the Kame Hills structures are under 2

**Table 7.2 Comparison of fabric attributes found on pots from
Pehonan/Keskatchewan and Kame Hills complexes**

	min.	mean	max.	no. cases
<i>Pehonan/Keskatchewan</i>				
(14 samples)				
Warp diameter, mm	1.6	2.05	2.9	8
Weft diameter, mm	1.8	2.54	3.2	14
Warp twist category	1.0	1.50	2.0	2
Weft twist category	1.0	1.83	3.0	6
Warp elements per cm	1.5	2.53	4.0	14
Weft elements per cm	4.0	6.62	10.0	13
Weft rows per cm	2.0	3.31	5.0	13
Fabric count	7.0	8.95	12.0	13
Warp density	3.4	5.00	6.3	8
Weft density	4.4	8.62	15.0	13
Total density	10.5	14.17	17.2	7
Complexity Index No.1	3.0	3.38	4.0	13
<i>Kame Hills</i>				
(25 samples)				
Warp diameter, mm	1.9	2.31	3.1	12
Weft diameter, mm	1.8	2.80	4.1	22
Warp twist category	1.0	1.50	2.0	2
Weft twist category	1.0	1.57	3.0	7
Warp elements per cm	1.5	2.25	4.0	22
Weft elements per cm	4.0	6.03	8.0	21
Weft rows per cm	2.0	3.01	4.0	21
Fabric count	5.5	8.29	10.5	21
Warp density	4.2	5.52	7.8	12
Weft density	5.4	8.36	10.0	22
Total density	12.0	13.70	17.1	12
Complexity Index No.1	3.0	3.19	4.0	21
Complexity Index No.2	4.0	4.64	5.5	11
Complexity Index No.3	5.5	5.67	6.0	3

**Table 7.3 Modern burlap textile attributes (adopted from
Drooker 1989,1990,1992)**

Warp diameter, mm	1.2
Weft diameter, mm	1.0
Number of warp plies	1.0
Number of weft plies	1.0
Warp twist category	2.0
Warp elements per cm	4.8
Weft elements per cm	4.8
Fabric count	9.6
Warp density	5.8
Weft density	4.8
Total density	10.6
Complexity Index No.1	3.0
Complexity Index No.2	4.0
Complexity Index No.3	6.0

mm. The number of weft elements which measure under 2 mm for the Pehonan/Keskatchewan and the Kame Hills impressed textiles are, one (7.1%) and four (13.8%), respectively. These measurements indicate that the majority of yarn elements used in both complexes are larger than those measured for burlap. The mean warp and weft yarns are slightly larger for Kame Hills impressed textiles than those from the Pehonan/Keskatchewan sample (Table 7.2).

Fabric count and density are slightly greater for Pehonan/Keskatchewan than Kame Hills textiles. This suggests the textiles from Kame Hills are not as densely constructed as those observed from the Pehonan/Keskatchewan complex. Although the fabric counts measured for both complexes are not quite as high as that measured for burlap, their fabric densities are greater. Weft-faced twining structures are more compactly constructed than plain interlaced fabric. Table 7.2 and Table 7.3 illustrate how the values for warp and weft densities of compact twining structures are reversed compared to plain interlacing structures.

A summary of complexity values is included for textile impressed pots from both regions (Table 7.2). Only Index No.1 could be measured for Pehonan/Keskatchewan impressed textiles as the variables necessary to calculate the remaining indices could not be obtained from the impressions. The Index No.1 values of 3.19 and 3.38 varied slightly between the two complexes skewing higher for the Pehonan/Keskatchewan impressed textiles. The complexity value for both complexes is slightly higher than the 3.0 value measured for burlap. Drooker (1989:201-202) states that the textiles involving the least

production complexity are weft-faced fabrics. This is followed by plain twined and alternate-paired twined fabrics. Complex fabrics actually contain greater numbers of thinner yarns as a whole. This is reflected by the attributes measured for Pehonan/Keskatchewan and Kame Hills impressed textiles.

Although the twining structures observed on the exterior surface impressions of Kame Hills pots appear less dense and seem to be comprised of larger yarn elements than those of the Pehonan/Keskatchewan samples, conclusions must be made with caution. The differences in fabric attributes found on the pot exteriors from both regions are slight. It is possible they could reflect regional differences in structural techniques. The results, however, could equally reflect the smaller sample size of Pehonan/Keskatchewan impressed vessels.

From the results tabulated for Table 7.1 and Table 7.2, it is apparent that the textile structures observed on Selkirk impressed pottery exhibit homogeneity between sites and complexes. Although unidentifiable structures are represented in both samples, these are a minor component and do not detract from the number and consistency of similar identifiable structures. Only the spaced twining examples found on the interior surfaces of Kame Hills vessels display significant variations. The structure(s) observed on the two cups associated with the Kame Hills complex appear similar to each other but different from those observed on the other vessels. Unfortunately the impressions are not clear enough for accurate interpretation.

The consistency of textile structures observed between the complexes helps to identify the homogeneity of the Selkirk composite. It is not yet known if the structural variations observed in the Kame Hills samples are representative of Selkirk-wide traits or are distinct regional textile-making structures. From the current study, the variations appear to reflect regional trends, both in textile structure (spaced twining) and in placement on the vessel (interior), given that neither traits have been observed in the Pehonan/Keskatchewan samples.

7.3 Textile Attributes and Pottery Manufacture

The attribute data collected from textile-impressed vessels from the Pehonan/Keskatchewan and Kame Hills complexes reveal a small range of presumably utilitarian textiles. Drooker (1989, 1990, 1992) believes fabric description is only an intermediate step en route to a broader objective: description of the functions for which impressed fabrics were made, the technology involved in their production, and the place of textiles in the socioeconomic system (Drooker 1992:146). It would be impossible to address all these points based on the limited data presently available for Selkirk textiles. However, several hypotheses were addressed by Drooker (1989:82-88, 1992:146-158) in order to determine whether the textiles used in pottery manufacture were made solely for that purpose or were originally made for other specialized uses. Some of the hypotheses were paraphrased in Chapter 2 to assist in defining the characteristics of textiles employed in Selkirk pottery production. The following discussion incorporates the points addressed in Chapter 2

Kuttruff and Kuttruff (1992:20) state that if textiles were used to line a mold to facilitate vessel removal and were separated from the vessel prior to firing, they could be used repeatedly. Specific fabric characteristics necessary for textile use in this manner include relatively high levels of flexibility, strength and durability. These characteristics are related to choices involving fiber, yarn and fabric made during the manufacturing of the textile.

Since the manufacture of textiles is more time and labour intensive than the manufacture of pottery, reuse would be desirable. Drooker (1992:168) estimates that it would take approximately 173 hours to produce an undecorated, medium-coarse weft-faced twining textile, equivalent in size to a medium bag (60 cm x 120 cm). This calculation takes into consideration fiber processing, yarn production and fabric construction.

Although the elapsed time to produce a large pottery vessel may be measured in days, actual hands-on time for a single vessel may be a matter of hours, considering the fact that drying, firing and at least some of the preparation of materials is done in bulk (Drooker 1989:243). Goltz (personal communication 1994) estimates that the actual forming of a vessel within a mold takes less than an hour. With gained experience, this time is reduced.

All of the identified structures from the Pehonan/Keskatchewan and Kame Hills complexes are fairly simple and somewhat standardized. All consist of single rather than multiple textile structures with the resulting fabrics being of a medium to coarse construction. The labour cost involved in producing the weft-faced, compact and spaced twining

structures observed in the study samples are lower than if the textile structures were more complex and intricate.

The stability of fabric structures may also have been an important factor in relation to its usage in pottery manufacture. An open twined textile would be much more stable and would have less yarn slippage than comparatively open interlaced fabric. No interlaced fabric structures were identified in the Selkirk samples even though a fabric of this type could have been made more quickly than the twined structures represented in the sample (Drooker 1992:55-56; Kuttruff and Kuttruff 1992:21).

Strong stable textiles would be desirable as the stresses placed on them during the handling of large plastic vessels and subsequent removal from the partially dried clay would be considerable (Kuttruff and Kuttruff 1992:20). Wear and distortions would be inevitable on the utilized textiles. Wear on impressed textiles is evidenced by missing or broken elements. Only seven impressions (17.1% of the total sample) exhibit missing or frayed elements, whereas 13 impressions (31.7% of the total sample) display fabric distortions evidenced by irregular twining elements forced out of their original positions by stress applied during use of the textile.

Many of the Selkirk impressed textiles are sturdy, incorporating medium sized yarns into firmly twined structures. Although only six (17.9%) of the Kame Hill textiles and five (38.5%) of the Pehonan/Keskatchewan textiles have fabric counts greater than that found for burlap, many of the fabric densities measured for the two samples are equal to or greater than that measured for burlap.

Most of the fabrics employed for manufacturing Selkirk pottery could have been removed fairly easily from the partially dried vessels and reused. The textiles are comprised of yarns which appear to represent long fibers. No protruding ends were observed which would indicate shredding or extensive processing. Longer fibers generally have more strength than yarns made of shorter fibers, such as fur, feather or seed hair (Kuttruff and Kuttruff 1992:20). No textiles observed on Selkirk impressions were made from fuzzy yarns, and no impressions of fur fabrics were found. Due to the smoothing of the exterior surfaces of Selkirk vessels, it is difficult to determine the depth of indentation made by the impressed textile. However, the textiles appear evenly impressed on the vessel surfaces.

It is difficult to determine the flexibility of the textiles observed on Selkirk pottery. Drooker (1992:54-56) and Kuttruff and Kuttruff (1992:21) indicate the spacing between twining rows affects the flexibility of the fabric, with the more open constructions being more flexible and more easily manipulated than the firm, stiff textiles produced by tightly executed twined structures. From her observations, however, Drooker (1992:148) found that even the largest-scale weft-faced fabric is flexible enough to bend under an excurve rim.

Drooker (1992:55) notes that weft-faced fabrics of any structure are denser, smoother and usually firmer than their more balanced counterpart in which the warps are visible. Firmness, however, depends on the actual amount of yarn packed into a given space: if thick, soft wefts are loosely twined into place, they may cover the warp and still result in a relatively flexible fabric. Except for five spaced twining

structures, all identified impressed textiles used on Selkirk pottery are of compact to weft-faced construction. Their flexibility, compared to other textile structures, does not seem to be a detracting factor for their use in pottery manufacture.

It can be assumed that the textiles used in manufacturing Selkirk pottery were selected for their large size. The textiles were large enough to cover the entire surface of the vessel. This is evidenced by the fact that no edge structures were observed. In 16 cases (39.0% of the identified structures) where overlapping occurs, the textile structures are the same and possibly represents the same fabric which was folded to conform to the mold. Overlapping is only observed on the body/basal regions of the vessels. Two rim sections from the Kame Hills sample have bunching of the fabric below the rim which would occur if a wide fabric were used and had to be gathered together (Drooker 1989:275).

Three (7.3% of the identifiable total) impressions indicate two or more layers of textiles. These are represented on the interior impressions found in the Kame Hills sample. Because no edge structures are visible, it cannot be determined if the impressions represent layers of the same textiles or layers of different textiles.

The orientation of textiles observed on Selkirk impressions exhibit a preponderance for twining rows parallel to the rim. All but one of the identified rim portions for both complexes have twined structures with the warp elements oriented perpendicular to the rim. The only rim sherd which does not show this orientation is from a Kame Hills plate impression. Textiles observed on eight body portions of vessels from the Kame Hills sample also exhibit twining rows parallel to the rim.

Although the textile orientation is consistent regardless of vessel form, it does not necessarily imply that the textiles were used to compliment vessel form or enhance vessel function.

Although the textiles appear to be aesthetically placed on the vessels with care given to their orientation, it is doubtful that the textiles were intended as decoration. All of the impressed surfaces were smoothed prior to firing. The smoothed finish obliterates the subtleties of the textile structures. The smoothed finish also reduces functional qualities of the vessel. A roughened exterior would increase the heating surface area of a cooking vessel as well as its gripability.

This discussion illustrates how the textiles impressed on Selkirk pottery are fairly standardized between and within complexes. None required a large investment of time to produce. This suggests they are utilitarian; however, it is not known if they are representative of all textiles employed by the northern Algonquian peoples. Although it is possible the textiles were produced specifically for pottery production, it is more likely they served some other function prior to or in conjunction with pottery manufacture. Drooker (1990:177, 1992:158) notes that Mississippian textile artifacts that range from 60 cm or more in their smaller dimensions include skirts, mantles, blankets, bags and nets. The only artifacts which have similar yarn sizes and structures as those found in the Selkirk samples are the blankets and bags.

Drooker (1992:150) found that Wickliffe textiles seemed to be selected based on certain criteria. The same is true for Selkirk textiles. The exterior impressions were produced by large, sturdy textiles whereas the interior impressions were represented by finer, more

flexible textiles. This criterion may also be represented by textiles impressed on the small cups.

The textiles represented by Selkirk pottery reflect utilitarian properties which are consistent throughout the composite. It is evident that these properties determined their use in the pottery manufacturing process. Hanna (1983:33) describes several features which indicate that Selkirk pottery was made by experienced and competent potters. This is evident in the symmetrical profile of the vessels, the thinness of the walls and considerable size of the vessels. The choice of textile would be an important contribution to this process.

By reviewing all the observations made during this analysis, it can be stated with some certainty that the textiles impressed on Selkirk pottery served an integral part in pottery manufacture. Textiles were probably used as a separating agent between the mold and the clay vessel. The lack of edge structures precludes the use of narrow textile objects such as braided belts, sashes or bands. The textiles employed were large, seamless fabric structures.

Given the orientation of the textiles on the vessels and their associated characteristics (i.e., warp rows perpendicular to rim, overlapping occurring only on body/basal sections, distortions occurring mostly near the rims), it seems apparent that seamless bags were employed as part of the pottery process. Stress applied to the bags after repeated use would cause distortions near the top edge. The systematic placement of the textiles could indicate decoration, but in effect, is the result of the manufacturing process. The lack of decorative elements would also indicate that strong, flexible utility bags were used. The care

in the placement of the textile may reflect the aesthetic nature of an experienced craftperson.

7.4 Summary

The Pehonan/Keskatchewan and Kame Hills complexes, as part of the Selkirk composite, share a similar material culture. However, sufficient variations are present in their ceramics to recognize regional differences. By comparing fabric attributes found on textile-impressed pottery from the two complexes, both similarities and differences are observed. The Selkirk composite textiles are represented by medium to coarse twining structures. These structures were comprised of yarns worked in an S-twining twist to produce compact and weft-faced fabrics. The results were strong, durable textiles which were probably utilitarian in nature. Regional variances are evident in the spaced twining structures observed in the Kame Hills region. These are not only structurally different than the impressed textiles observed on the Pehonan/Keskatchewan pottery, but are found mostly on the interior surfaces of the vessels. No interior impressions are observed for Pehonan/Keskatchewan ceramics.

In order to understand the relationship of the textiles to pottery manufacture, it is important to understand the characteristics of the textiles. By examining the textile attributes, it is evident that the textiles used in Selkirk pottery have structures suited to pottery production. Although the neatness used in the application of the textiles to the vessel surfaces may indicate a decorative purpose, it is more likely to reflect the nature of the utilized textile, a seamless bag. The neatness may also

reflect the care and expertise used by skilled craftpeople towards their work in general.

CHAPTER EIGHT

8.0 CONCLUSIONS AND RECOMMENDATIONS

8.1 Conclusions

The goal of this research has been to identify textile structures found on impressed pottery of the Pehonan/Keskatchewan and Kame Hills complexes and the possible relationship of textiles to the pottery manufacturing process. The Pehonan/Keskatchewan and Kame Hills complexes are part of a larger, widespread archaeological manifestation, the Selkirk composite, which extends across the boreal forest regions of northwestern Ontario, Manitoba and Saskatchewan. The objectives were to broaden what is known about the Selkirk material culture, to assess the variability and/or homogeneity within and between the two complexes and to help define the distinctiveness of the Selkirk material in relation to that of neighbouring archaeological constructs. These objectives were pursued through the analysis of impressed pottery from the two Selkirk complexes.

Very little information was available regarding textile production by pre-contact peoples of the boreal forest of central and midwestern Canada. It was, therefore, necessary to use information obtained from historical and ethnographical accounts of neighbouring groups in order

to determine possible textile structures. By integrating this information with textile attribute studies, this present research demonstrates which textile structures were employed by Selkirk potters in the production of their ceramics.

A characteristic trait of Selkirk potters was the care and expertise used in the production of their ceramics. Textile attribute data on 47 textile-impressed vessels from 17 sites were collected. The analysis of the impressed textiles indicates they were an integral part of pottery manufacture. The textile impressions of the exterior surfaces represent a fabric which was used as a separating agent between the clay vessel and the mold. Given the orientation of structures on the vessels, the most likely textile source is a seamless bag. The textiles appear utilitarian and there is a strong consistency in their placement on the vessels. The consistency of fabric orientation may in part be attributable to the attention given to all aspects of Selkirk pottery manufacture. It most plausibly results, however, from the consistent use of seamless bags in a standardized manufacturing process. Accordingly, the evidence presented from Selkirk pottery supports the viewpoint that textile usage had attained an important role in pre-contact times.

The results of this investigation confirm the homogeneity of the Selkirk composite. The textiles represent utilitarian structures which do not vary significantly between sites or complexes. There is, however, enough structural differentiation to indicate regional variation between complexes. Based on identified structures, the textiles more closely resemble those associated with historically known southern Ojibwa groups rather than those used by the northern Athapaskan peoples. The

Kame Hills textiles more accurately portray structures noted for these peoples. These are evident in the spaced twining and compact twining structures.

Despite their proximity to Athapaskan groups, there is little to indicate, archaeologically, that they shared a similar textile industry. Textile structures associated with the historic Athapaskan peoples are not represented in these Selkirk samples. Looping was a common textile structure used in the construction of various Athapaskan bags. It is known that the historic Cree used the looping technique to make large objects such as blankets and coats; however, it was not employed for textiles used in pre-contact pottery production. Interestingly, although lithic tools affiliated with Athapaskan groups have been recovered from Kame Hills sites, their associated textile structures are not represented in the textile-impressed pottery.

Although it was not the purpose of this thesis, a note has to be made regarding ethnographic interpretation. Whiteford (1992:75) writes that compact plain and twill twining which produced a weft-faced textile appeared among the Ojibwa during the nineteenth century. Whiteford (1992:75) notes this type of twining structure was associated with the use of respun trade wool. Based on the weft-faced and compact twining structures represented in this sample, it seems apparent that these twining variations had a much longer history in the surrounding region than can be accounted for by studying the ethnographic record.

Whiteford (1992:75-76) states that the earlier Ojibwa twined bags were constructed differently than the historic ones. Although there is no archaeological evidence to indicate how the bags were constructed,

inferences suggest the technique used to construct the weft-faced textiles could have been used much earlier. Unfortunately, bottom seams were not apparent on any of the textile impressions. Considering that basal portions of vessels were not well represented, it would be difficult to form any conclusions.

The textile structures identified in this study merely illustrate the textiles employed in pottery manufacture. From this sample, it is not possible to deduce the total range of fabrics produced or used. However, as Kuttruff (1988:170) states of her research, the insights gained from the study of textile data, are significant in the continuing quest for a better understanding of the importance and use of textiles by pre-contact peoples.

8.2 Recommendations for Future Research

This research represents the first systematic study of textile attributes for pottery of the Selkirk composite. The development of more analytical studies of neighbouring textile producing peoples will increase our knowledge of their material cultures. Although, the accumulation of data on pre-contact textiles will result in a better understanding of the importance of textiles in these societies, it will also result in a better understanding of the relationship between cultural groups. For instance, attribute analysis on pottery from other Selkirk complexes such as Clearwater Lake and Kisis, as well as the Grass River region, would enhance the existing study. Attribute analysis from preceding groups such as Blackduck and Avonlea, who also produced textile-impressed pottery, would assist in determining cultural ties or

boundaries. This is also true for the neighbouring Rainy River and Old Women's peoples. cursory examinations of Sandy Lake impressed pottery indicate that a different textile structure was used on the pottery and the textile orientation was also different. More comprehensive textile studies would contribute in the understanding of the relationship between these groups.

It is important that vessels be reconstructed. Reconstructions of vessels are a necessity when determining the method of pottery and/or textile manufacture. Many vessels are represented by reconstructed rim and neck portions with little attention given to the body sections of the vessels. Although reconstructions are a time consuming endeavour, they facilitate the recognition of production techniques employed by the potter. They also assist the recognition of textile structures. This is especially true with distorted or discontinuous textile impressions.

In order to understand the structures found on impressed pottery, it is ideal to have actual textile artifacts available for comparative purposes. With very little available for this region, experimental textile production studies may be the only means of obtaining information about possible textile structures. For best replication results, Kuttruff (1988:166) suggests that fibers should be collected from a wide range of fiber sources at different times of the year. Collection should include fibers at different growth stages, using a variety of methods, as well as unprocessed and processed fibers or fibrous materials.

Similarly, with the lack of ethnographic and archaeological information about pottery manufacturing techniques, more attention must be given to experimental pottery production. It is only through

experimentation, that manufacturing processes may be inferred. There are many factors (i.e., textile structures, clay sources, paste characteristics, vessel size/shape) which may reflect different manufacturing processes. By comparing archaeological specimens with experimental products, it may be possible to determine more definitely what processes were involved in the pottery manufacturing processes. Studies, such as Simon's (1979), indicate how a synthesis of primary observations and technical experimentation maximizes the information which may be extrapolated concerning specific production techniques and the culture as a whole.

REFERENCES

Adovasio, J.M.

1977 *Basketry Technology: A Guide to Identification and Analysis*. Aldine Publishing Company, Chicago.

1982 Basketry and Netting Impressions. In *The Prehistory of the Paintsville Reservoir, Johnson and Morgan Counties, Kentucky*, edited by J.M. Adovasio, pp. 826-840. Department of Anthropology, University of Pittsburgh.

Adovasio, J.M. and R.L. Andrews

1980 Basketry, Cordage and Bark Impressions from the Northern Thorn Mound (46Mg78), Monongalia County, West Virginia. *West Virginia Archeologist* 30:33-72.

Adovasio, J.M. and R.J. Carlisle

1982 External Affinities of the Paintsville Reservoir Perishable Industry. In *The Prehistory of the Paintsville Reservoir, Johnson and Morgan Counties, Kentucky*, edited by J.M. Adovasio, pp. 840-845. Department of Anthropology, University of Pittsburgh, Pittsburgh.

Barbeau, Marius

1972 *Assomption Sash*. Bulletin 93: Anthropological Series No. 24, National Museum of Canada.

Barber, E.J.W.

1990 *Prehistoric Textiles*. Princeton University Press, Princeton, New Jersey.

Bernick, Kathryn

- 1987 The Potential of Basketry for Reconstructing Cultural Diversity on the Northwest Coast. In *Ethnicity and Culture: Proceedings of the Eighteenth Annual Conference of the Archaeological Association of the University of Calgary*, edited by Rénald Auger, Margaret F. Glass, Scott MacEachern and Peter H. McCartney, pp. 251-257. The University of Calgary, Calgary.

Brasser, Ted J.

- 1975 A Basketful of Indian Culture Change. *National Museum of Man Mercury Series: Canadian Ethnology Service Paper No. 22*. National Museums of Canada, Ottawa.
- 1976 "Bo'jou Neejee!" *Profiles of Canadian Indian Art*. National Museums of Man, Ottawa.

Burley, D., J. Finnigan, O. Klimko and J. Prentice

- 1982 *Nipawin Reservoir Heritage Study, Volume 2: Phase 1 Field Report and Datalog*. Saskatchewan Research Council Publication No. C-805-9-E-82, Saskatoon.

Burnham, Dorothy K.

- 1976 Braided "Arrow" Sashes of Quebec. In *Irene Emery Roundtable on Museum Textiles, 1976 Proceedings, Ethnographic Textiles of the Western Hemisphere*, edited by Irene Emery and Patricia Fiske, pp. 356-365. The Textile Museum, Washington, D.C.
- 1981 *The Comfortable Arts: Traditional Spinning and Weaving in Canada*. National Museums of Canada, Ottawa.

Church, Flora

- 1987 Current Research on Ohio's Prehistoric Textiles. In *Ethnicity and Culture: Proceedings of the Eighteenth Annual Conference of the Archaeological Association of the University of Calgary*, edited by R. Auger, M.F. Glass, S. MacEachern and P.H. McCartney, pp. 155-161. The University of Calgary Archaeological Association, Calgary.

Cleland, Charles E.

- 1982 The Inland Shore Fishery of the Northern Great Lakes: Its Development and Importance in Prehistory. *American Antiquity* 47(4):761-784.

Collingwood, Peter

- 1974 *The Techniques of Sprang*. Watson-Guptill Publications, New York.

Croes, Dale, R.

- 1977 *Basketry from the Ozette Village Archaeological Site: A Technological, Functional and Comparative Study*. Unpublished Ph.D. dissertation, Washington State University, Washington.

Densmore, Frances

- 1929 *Chippewa Customs*. Bureau of American Ethnology, Bulletin 86. Smithsonian Institution, Washington.
- 1974 *How Indians Used Wild Plants for Food, Medicine and Crafts, Formerly titled Uses of Plants by the Chippewa Indians*. Originally published in 1929, Dover Publications, Inc., New York.

Dickson, Gary A.

- 1980 The Kame Hills Site. *Papers in Manitoba Archaeology, Final Report No. 9*. Historic Resources Branch, Department of Cultural Affairs and Historic Resources, Winnipeg.

- 1983 Archaeological Research in the Kame Hills Locality of Southern Indian Lake. *Papers in Manitoba Archaeology, Final Report No. 15*. Historic Resources Branch, Department of Cultural Affairs and Historic Resources, Winnipeg.
- Douglas, Frederick H., Kate Peck Kent and N. Feber
1968 *An Osage Bag*. Material Culture Notes, Denver Art Museum, Denver.
- Douglass, John M.
1946 Textile Imprints on Wisconsin Indian Pottery. *Wisconsin Archeologist* 27(3):71-80.
- Drooker, Penelope Ballard
1989 *Textile Impressions on Mississippian Pottery at the Wickliffe Mounds Site (15BA4), Ballard County, Kentucky*. Unpublished Master's thesis, Harvard University, Cambridge.

1990 Textile Production and Use at Wickliffe Mounds (15BA4), Kentucky. *Midcontinental Journal of Archaeology* 15(2):163-220.

1992 *Mississippian Village Textiles at Wickliffe*. The University of Alabama Press, Tuscaloosa.
- Emery, Irene
1966 *The Primary Structure of Fabrics, an Illustrated Classification*. The Textile Museum, Washington, DC.
- Ewers, John, C.
1945 The Case for Blackfoot Pottery. *American Anthropologist* 47(2):289-299.
- Florian, Mary-Lou E.
1990 Identification of Plant and Animal Materials in Artifacts. In *The Conservation of Artifacts Made From Plant Material*, edited by Mary-Lou E. Florian, Dale Paul Kronknight and Ruth E. Norton, pp. 38-55. Princeton University Press.

Fraser, David W.

- 1989 *A Guide to Weft Twining and Related Structures with Interacting Wefts*. University of Pennsylvania Press, Pennsylvania.

Gibson, Terrance H.

- 1993 Whom Kelsey Met: Lifestyles and Technology of the Late-Seventeenth-Century Cree. In *Three Hundred Prairie Years: Henry Kelsey's Inland Country of Good Report*, edited by Henry Epp, pp. 95-112. University of Regina, Regina, Saskatchewan.
- 1994 *Bushfield West (FhNa-10): A Single Component Selkirk Campsite on the Saskatchewan River*. Ms on file. Saskatchewan Research Council/Western Heritage Services Incorporation, Saskatoon.

Gilman, Carolyn

- 1982 *Where Two Worlds Meet: the Great Lakes Fur Trade*. Minnesota Historical Society, St. Paul.

Gilmore, Melvin, R.

- 1985 Some Chippewa Uses of Plants (1932). In *An Ethnobiology Source Book: The Uses of Plants and Animals by American Indians*, edited by Richard I. Ford, pp.119-143. Garland Publishing Inc., New York.

Goodchild, Peter

- 1984 *Survival Skills of the North American Indians*. Chicago Review Press, Chicago.

Goltz, Grant

- 1989 *Woodland Ceramics (Cord-Wrapped Paddle and Other Archaeological Myths)*. Paper presented at the Lake Superior Basin Workshop.
- 1991 *Ceramic Techniques of the Western Great Lake Woodlands*. Ms. on file, Manitoba Museum of Man and Nature, Winnipeg.

Hanna, Margaret

- 1983 The Pot that Shattered: Processes Responsible for Breakage of a Vessel Recovered from Bushfield West (FhNa-10). *Saskatchewan Archaeology* 4:31-37.

Hlady, Walter M.

- 1970 Manitoba - the Northern Woodlands. In *Ten Thousand Years: Archaeology in Manitoba*, edited by W. M. Hlady, pp.93-121. Manitoba Archaeological Society, Winnipeg.

- 1971 An Introduction to the Archaeology of the Woodlands Area of Northern Manitoba. *Manitoba Archaeological Newsletter* 8(2&3).

Holmes, William H.

- 1884 Prehistoric Textile Fabrics of the United States, Derived From Impressions on Pottery. *Third Annual Report of the Bureau of Ethnology*, pp.393-425. Government Printing Office, Washington.
- 1896 Prehistoric Textile Art of the Eastern United States. *Thirteenth Annual Report of the Bureau of Ethnology*, pp.3-46. Government Printing Office, Washington.
- 1901 Use of Textiles in Pottery Making and Embellishment. *American Anthropologist* 3(3):397-403.

Honigsmann, John J.

- 1956 The Attawapiskat Swampy Cree: An Ethnographic Reconstruction. *Anthropological Papers of the University of Alaska*. 5(1):23-82.
- 1981 West Main Cree. In *Handbook of the North American Indians, Volume 6: Subarctic*, edited by June Helm, pp.217-230. Smithsonian Institution, Washington.

Hurley, William M.

- 1979 *Prehistoric Cordage: Identification of Impressions on Pottery*. Aldine Manuals on Archeology, Taraxacum, Washington.

Johnson, Brenda

- 1962 *A Study of Textile Impressed Pottery in Kentucky*. Ms on file, Museum of Anthropology, Lexington.

Karklins, Karlis

- 1992 *Trade Ornament Usage Among the Native Peoples of Canada: A Source Book*. National Historic Sites, Parks Service, Environment Canada, Ottawa.

Kelly, Michael E.

- 1978 Cluster Analysis of a Southern Indian Lake Regional Ceramic Sample. *Archae-Facts* 5(2&3):65-72.

Kent, Kate Peck

- 1975 Mesoamerican and North American Textiles. In *Irene Emery Roundtable on Museum Textiles 1974 Proceedings: Archaeological Textiles*, edited by Patricia L. Fiske, pp.31-36. The Textile Museum, Washington, D.C.

- 1983 *Prehistoric Textiles of the Southwest*. School of American Research, Sante Fe.

Kinietz, Vernon and Volney H. Jones

- 1942 Notes on the Manufacture of Rush Mats Among the Chippewa. *Papers of the Michigan Academy of Science, Art and Letters* 27:525-537.

King, Mary Elizabeth

- 1975 Archaeological Textiles. In *Irene Emery Roundtable on Museum Textiles, 1974 Proceedings: Archaeological Textiles*, edited by Patricia L. Fiske, pp.9-13. The Textile Museum, Washington, D.C.

- 1976 General Introduction to Ethnographic Textiles of the Western Hemisphere. In *Irene Emery Roundtable on Museum Textiles, 1976 Proceedings, Ethnographic Textiles of the Western Hemisphere*, edited by Irene Emery and Patricia Fiske, pp.9-13. The Textile Museum, Washington, D.C.

- 1978 Analytical Methods and Prehistoric Textiles.
American Antiquity 43(1):89-96.
- King, Mary Elizabeth and Joan S. Gardner
1981 The Analysis of Textiles from Spiro Mound,
Oklahoma. In *The Research Potential of
Anthropological Museum Collections*, edited by
Anne-Marie E. Cantwell, James B. Griffin and Nan A.
Rothchild, pp.123-139. The New York Academy of
Sciences, New York.
- Krech III, Shepard and Barbara A. Hail
1991 Introduction. *Arctic Anthropology* 28(1):1-5.
- Kroker, Sid
1990 Archaeology and Hydro-Electric Development in
Northern Manitoba: A Retrospective on the Churchill
River Diversion and Nelson River Power
Development. *Manitoba Archaeological Quarterly*
14(1-4).
- Kuttruff, Jenna Tedrick
1980 Prehistoric Textiles Revealed by Potsherds. *Shuttle,
Spindle and Dyepot* 11(3):40-41;80.
- 1986 Use and Manufacture of Prehistoric Textiles as
Evidenced in Mississippian Period Fabric Impressed
Pottery. *Association of College Professors of Textiles
and Clothing, National Meeting Proceedings*, pp.125.
- 1988a *Textile Attributes and Production Complexity as
Indicators of Caddoan Status Differentiation in the
Arkansas Valley and Southern Ozark Regions*.
Ph.D. dissertation, Department of Textiles and
Clothing, College of Home Economics, The Ohio
State University, Ohio.

- 1988b Techniques and Production Complexity of the Mississippian Period Textiles from Spiro, Oklahoma. In *Textiles as Primary Sources: Proceedings of the First Symposium of the Textile Society of America, Minneapolis Institute of Art*, edited by John E. Vollmer, pp.145-148. Textile Society of America.
- 1993 Mississippian Period Status Differentiation Through Textile Analysis: A Caddoan Example. *American Antiquity* 58(1):125-145.
- Kuttruff, Jenna Tedrick and Carl Kuttruff
- 1992 Textile Production and Use as Revealed in Fabric Impressed Pottery from Mound Bottom (40CH8), Tennessee. *Mississippi Archaeology* 27(2):1-27.
- Landes, Ruth
- 1971 *The Ojibwa Woman*. W.W. Norton and Company, New York.
- Leighton, Anna L.
- 1985 Wild Plant Use By the Woods Cree (Nihithawak) of East-Central Saskatchewan. *National Museum of Man Mercury Series Paper* No.101.
- Lenius, Brian J. and Dave M. Olinyk
- 1990 The Rainy River Composite: Revisions to Late Woodland Taxonomy. In *The Woodland Tradition in the Western Great Lakes: Papers Presented to Elden Johnson*, edited by Guy E. Gibbon, pp.77-112. University of Minnesota, Publications in Anthropology, Number 4, Minneapolis.
- Lyford, Carrie A.
- 1942 *The Crafts of the Ojibwa (Chippewa)*. A Publication of the Education Division, U.S. Office of Indian Affairs.
- MacNeish, Richard S.
- 1958 *An Introduction to the Archaeology of Southeast Manitoba*. National Museum of Canada Bulletin No.157. Queen's Printer, Ottawa.

MHRB (Manitoba Historic Resources Branch); Archaeology, Culture
Heritage and Citizenship, Winnipeg

- 1971 Churchill Diversion Archaeological Project Site
Survey Form for SIL-50. Completed by David K.
Riddle, July 14, 1971.
- 1974 Manitoba Provincial Site Inventory Form for Hats
Come In Handy site (HhLp-3). Completed by Stan
Saylor, March 11, 1974.
- 1978 Archaeological Site Inventory Form for HfLp-12.
Completed by Brian Lenius and Barry Greco,
December 11, 1978.
- 1985 Archaeological Site Inventory Form for Bruce Taite-
Vernon Anderson Site. Completed by David K.
Riddle, November 1985.
- 1986 Archaeological Site Inventory Form for Hats Come In
Handy Site (HhLp-3). Completed by Virginia Petch,
February 5, 1986.
- 1990 Archaeological Site Inventory Form for First Flooded
Little Sand River Rapids Site (HkLq-6). Completed
by David K. Riddle, September 25, 1990.
- 1991 Manitoba Archaeological Site Data Update Form for
Hats Come In Handy Site (HhLp-3). Completed by
David K. Riddle, March 18, 1991.
- 1992 Archaeological Site Inventory Form for HeLs-16.
Completed by David K. Riddle, February 12, 1992.
- 1993 Archaeological Site Inventory Form for Look for
Beaver Site (HdLw-5). Completed by David K.
Riddle, January 25, 1993.

Manitoba Museum of Man and Nature, Winnipeg

- 1987 Specimen Catalogue for HfLp-12.

Marles, Robin James

- 1984 *The Ethnobotany of the Chipewyan of Northern Saskatchewan*. Unpublished Master's thesis, Department of Biology, University of Saskatchewan, Saskatoon.

Maslowski, Robert F.

- 1984 The significance of Cordage Attributes in the Analysis of Woodland Pottery. *Pennsylvania Archaeologist* 54(1-2):51-60.

Meyer, David

- 1978a The Clearwater Lake Phase: A Saskatchewan Perspective. *Archae-Facts* 5(2&3):27-42.
- 1978b Prehistoric Pottery from Northern Saskatchewan. *Napao* 8(1&2):5-30.
- 1981 Late Prehistoric Assemblages from Nipawiwini: the Pehonan Complex. *Saskatchewan Archaeology* 2(1&2):4-38.
- 1984 Anent the Pehonan Complex. *Saskatchewan Archaeology* 5:43-46.
- 1987 Time-Depth of the Western Woods Cree occupation of Northern Ontario, Manitoba, and Saskatchewan. In *Papers of the Eighteenth Algonquian Conference*, edited by William Cowan, pp.187-200. Carleton University, Ottawa.
- 1993 People Before Kelsey: An Overview of Cultural Developments. In *Three Hundred Prairie Years: Henry Kelsey's Inland Country of Good Report*, edited by Henry Epp, pp.54-73. University of Regina, Regina.

Meyer, David and Henry Epp

- 1990 North-South Interaction in the Late Prehistory of Central Saskatchewan. *Plains Anthropologist* 35(132):321-342.

- Meyer, David, Terry Gibson and Dale Russell
 1992 The Quest for Pasquatinow: An Aboriginal Gathering Centre in Saskatchewan River Valley. *Prairie Forum* 17(2):201-223.
- Meyer, David and Scott Hamilton
 1994 Neighbors to the North: Peoples of the Boreal Forest. In *Plains Indians, A.D. 500-1500: The Archaeological Past of Historic Groups*, edited by Karl H. Schlesier, pp.96-127. University of Oklahoma Press, Norman.
- Meyer, David and Dale Russell
 1987 The Selkirk Composite of Central Canada: A Reconsideration. *Arctic Anthropology* 24(2):1-31.
- Meyer, David, Ernest G. Walker and David Burley
 1990 Corrections on "Recent Evidence for a Long Distance Exchange Network in the Central Saskatchewan Pehonan Complex." *Saskatchewan Archaeology* 11&12:69-73.
- Millar, James F.C.
 1983 *The Chartier Sites: Two Stratified Campsites on the Kisis Channel Near Buffalo Narrows, Saskatchewan*. Northern Heritage Limited.
- Minni, Sheila J.
 1975 *The Prehistoric Occupations of Black Lake, Northern Saskatchewan*. Unpublished Master's thesis, Department of Anthropology and Archaeology, University of Saskatchewan, Saskatoon.
- Orchard, William C.
 1984 *The Technique of Porcupine Quill Decoration Among the Indians of North America*. Eagles View Publishing, Liberty, Utah.
- Osgood, Cornelius
 1966 *The Ethnography of the Tanaina*. Yale University Publications in Anthropology, Number 16. Reprinted from 1937 edition by Human Relations Area Files Press, New Haven.

- 1970a *Contributions to the Ethnography of the Kutchin*. Yale University Publications in Anthropology, Number 14. Reprinted from 1936 edition by Human Relations Area Files Press, New Haven.
- 1970b *Ingalik Material Culture*. Yale University Publications in Anthropology, Number 22. Reprinted from 1940 edition by Human Relations Area Files Press, New Haven.
- 1971 *The Han Indians: A Compilation of Ethnographic and Historical Data on the Alaska-Yukon Boundary Area*. Yale University Publications in Anthropology, Number 74. New Haven.
- Paquin, Todd A.
- 1994 *The Kisis Complex of the Selkirk Composite: Classification, Origins, and Possible Influences in the Boreal Forest of Northern Saskatchewan*. Paper presented at the Canadian Archaeological Association (CAA) Conference, Edmonton, May 4-8.
- Quigg, J. Michael
- 1983 The Lloyd Site. In: *Nipawin Reservoir Heritage Study Volume 6: 1982 Final Excavations*, edited by David Meyer, pp. 67-207. Saskatchewan Research Council Publication No. E-903-6-E-83, Saskatoon.
- Quimby, George I.
- 1961 Cord Marking Versus Fabric Impressing of Woodland Pottery. *American Antiquity* 26(3):426-428.
- Rachlin, Carol K.
- 1955 The Rubber Mold Technic for the Study of Textile-Imprinted Pottery. *American Antiquity* 20(4):394-396.

- 1960 The Historic Position of the Proto-Cree Textiles in the Eastern Fabric Complex, An Ethnological-Archaeological Correlation. *Contributions to Anthropology*, 1958. National Museum of Canada, Bulletin No.167, pp.80-89. Queen's Printer, Ottawa.
- Rajnovich, Grace
- 1983 The Spruce Point Site: A Comparative Study of Selkirk Components in the Boreal Forest. *Conservation Report* No.1. Ontario Ministry of Citizenship and Culture, Ontario.
- Rajnovich, M.G.N. and C.S. Reid
- 1978 Selkirk and Clearwater Lake Ceramics on the Lake of the Woods: An Overview. *Archae-Facts* 5(2&3):43-48.
- Ray, Arthur J.
- 1974 *Indians in the Fur Trade: Their Role as Hunters, Trappers and Middlemen in the Lands Southwest of Hudson Bay 1660-1870*. University of Toronto Press, Toronto.
- Rhodes, Daniel
- 1957 *Clay and Glazes for the Potter*. Chilton Book Company, Philadelphia.
- Rice, Prudence
- 1987 *Pottery Analysis: A Sourcebook*. The University of Chicago Press, Chicago.
- Rich, E.E., ed.
- 1949 *James Isham's Observations on Hudsons Bay, 1743*. The Champlain Society, Hudson's Bay Company Series, Publication No.12. Toronto.
- Riddle, David
- 1985 An Expanded Distribution of Clearwater Lake Punctate Ceramic Plates. *Manitoba Archaeological Quarterly* 9(4):36-44.

- 1994 *A Report Detailing the Results of Archaeological Surveys Conducted Along the Churchill River Diversion in the Churchill River/Opachuanau Lake Area, on Southern Indian Lake and the Rat and Burntwood Rivers During the 1993 Field Season*. Ms on file, Manitoba Hydro Mitigation Department, Winnipeg.
- Rogers, Edward S.
- 1967 *The Material Culture of the Mistassini*. National Museum of Canada, Bulletin 218. Queen's Printer, Ottawa.
- 1983 *Cultural Adaptations: The Northern Ojibwa of the Boreal Forest*. In *Boreal Forest Adaptations: The Northern Algonkians*, edited by A. Theodore Steegmann, Jr., pp.85-141. Plenum Press, New York.
- 1985 *A Northern Algonquian Source Book: Papers By Frank G. Speck*. Garland Publishing, Inc., Washington.
- Rogers, Edward S. and Eleanor Leacock
- 1981 *Montagnais-Naskapi*. In *Handbook of North American Indians Volume 6: Subarctic*, edited by June Helm, pp.169-189. Smithsonian Institution, Washington.
- Rogers, Edward S. and J. Garth Taylor
- 1981 *Northern Ojibwa*. In *Handbook of North American Indians Volume 6: Subarctic*, edited by June Helm, pp.231-243. Smithsonian Institution, Washington.
- Rye, Owen S.
- 1981 *Pottery Technology: Principles and Reconstruction*. Manuals on Archaeology No.4, Taraxacum, Washington.
- Samuel, Cheryl
- 1982 *The Chilkat Dancing Blanket*. Pacific Search Press, Seattle.

- 1987 *The Raven's Tail*. The University of British Columbia Press, Vancouver.
- Saylor, Stan
 1978 An Introduction to Fabric Impressions on Selkirk Ware. *Archae-Facts* 5(2&3):49-56.
- Scholtz, Sandra Clements
 1975 *Prehistoric Plies: a Structural and Comparative Analysis of Cordage, Netting, Basketry and Fabric from the Ozark Bluff Shelters*. Arkansas Archeological Survey, Research Series No.9, Fayetteville.
- Sibley, L.R., K.A. Jakes and C. Song
 1989 Fiber and Yarn Processing by Prehistoric People of North America: Examples from Etowah. *Ars Textrina* 11:191-209, Winnipeg.
- Simon, Arlyen
 1979 Pottery Manufacture Analysis: Experimental Assessment of Technological Continuity in the Altamont Region. *Archaeology in Montana* 20(2):1-78.
- Skinner, Alanson
 1912 Notes on the Eastern Cree and Northern Saulteaux. In *Anthropological Papers of the American Museum of Natural History* Volume IX, Part I.
- Smith, Brian J.
 1984 Selkirk Pottery from Two Northern Saskatchewan Site McCusker Lake (GhOe-1) and Anglin Lake (FkNI-3). *The Canadian Anthropologist* 1:26-38.
- Smith, Huron
 1932 Ethnobotany of the Ojibwe Indians. *Bulletin of the Public Museum of the City of Milwaukee* 4(3):327-525.

Smith, James G.E.

- 1981 Western Woods Cree. In *Handbook of North American Indians, Volume 6: Subarctic*, edited by June Helm, pp.256-270. Smithsonian Institution, Washington.

Sturtevant, William C.

- 1976 The Hole-and-Slot Heddle. In *Irene Emery Roundtable on Museum Textiles, 1976 Proceedings, Ethnographic Textiles of the Western Hemisphere*, edited by Irene Emery and Patricia Fiske, pp.325-355. The Textile Museum, Washington, D.C.

Syms, E. Leigh

- 1974 *Exterior Textile Impressions on Woodland Pottery from the Northeast Plains and Adjacent Northeastern Woodlands: An Integral and Necessary Step in Ceramic Production or an Expression of Artistic Preference?* Paper Presented at the Conference on Art and Technology, Calgary Archaeological Association, Calgary, November 15-17.
- 1977 Cultural Ecology and Ecological Dynamics of the Ceramic Period in Southwestern Manitoba, *Memoir 12. Plains Anthropologist* 76(2).
- 1986 *Making Latex Impressions of the Surfaces of Prehistoric Ceramics*. Ms on file, Manitoba Museum of Man and Nature, Winnipeg.

Thistle, Paul C.

- 1986 *Indian-European Trade Relations in the Lower Saskatchewan River Region to 1840*. The University of Manitoba Press, Winnipeg.

Vollmer, John

- 1975 Textile Pseudomorphs on Chinese Bronzes. In *Archaeological Textiles: Irene Emery Roundtable on Museum Textiles, 1974 Proceedings*, edited by Patricia L. Fiske, pp.170-174. The Textile Museum Washington, D.C.

White, Bruce M.

- 1984 " 'Give Us A Little Milk': The Social and Cultural Significance of Gift Giving in the Lake Superior Fur Trade." In *Rendezvous: Selected Papers of the 4th North American Fur Trade Conference 1981*, edited by Thomas C. Buckley. St. Paul.

Whiteford, Andrew Hunter

- 1977 Fiber Bags of the Great Lakes Indians. *American Indian Art* 2(3):52-64,85.
- 1991 Mystic and Decorative Art of the Anishinabe (Chippewa/Ojibwa). *Arctic Anthropology* 28(1):74-83.

Whitford, A.C.

- 1941 Textile Fibers Used in Eastern Aboriginal North America. In *Anthropological Papers of the American Museum of Natural History* 38(1):1-21.
- 1943 Fiber Plants of the North American Aborigines. In *Journal of the New York Botanical Garden* 44(518):25-34.

Willoughby, Charles C.

- 1952 Textile Fabrics from the Spiro, Mound. *The Missouri Archaeologist* 14:107-118.

Winfrey, R. Westwood

- 1971 A Look at Cord-Marked Pottery. *Eastern States Archeological Federation. Bulletin* No.30.

Yarnell, Richard Asa

- 1964 Aboriginal Relationships Between Culture and Plant Life in the Upper Great Lakes. In *Anthropological Papers, Museum of Anthropology, University of Michigan Number 23*, Ann Arbor.

APPENDIX:
DEFINITIONS OF TERMS

APPENDIX

The most comprehensive classification of textiles based on structure has been written by Emery (1966). The textile terminology defined below follows that of Emery when possible. Other sources supplement areas which needed expanding. These references will be indicated.

Alternate-pair twining: weft twining where warps are enclosed as pairs in one row and then split into new pairs in alternate rows. Can be used in either close or spaced twining structures. Also referred to as twined openwork, zigzag, twill, diagonal, and split-pair twining.

Babiche: rawhide line used for cordage among northern groups. It is often made from caribou skins cut spirally from the outer edge towards the centre.

Balanced interlacing: interlacing where the warp and weft elements are equally spaced and either identical or approximately equal in size and flexibility. It is also called plain interlacing or plain weaving. Balanced plain weave is sometimes called "checker board weave" in archaeological literature (Drooker 1992:244).

Bast: the stem structure of dicotyledonous plants such as flax, hemp, nettle, milkweed and jute. Inner bark is also referred to as bast fiber, not bark fiber.

Braided twining: is a variation of three-strand twining. The three wefts interweave with each other before they twine with the warp. On the back

side of the twining, the weft strands travel over two warps and lie at an angle which is in opposition to the slant of the strands in the front (Samuel 1987:32).

Cordage: general term used in archaeological literature to denote rope, string or yarn. It includes unspun, spun, twisted and braided structures (Drooker 1992:244).

Compact twining: twining in which the rows of active twining elements are spaced no more than the diameter of the twining elements apart (Kuttruff 1988:185).

Diverted warps: warp elements which are shifted from their normal longitudinal parallel direction in order to cross over (or under) other warp elements.

Element: a component part of a structure of an interworked fabric. The term refers to yarn, thread, strand, cord, thong or whatever unit of fibers or filaments is interworked to form a textile.

Fabric: a generic term which includes all fibrous constructions.

Fabric count: the number of elements per square centimetre. (The sum of the number of warp elements per centimetre plus the number of weft elements per centimetre).

Fabric scale: generalized term indicating fabric fineness (thin yarns, high fabric counts) or coarseness (thick yarns, low fabric counts) (Drooker 1992:245).

Fiber: a general term referring to the structural components of any animal or plant tissue used in the construction of textiles. Fibers, as opposed to filaments, are of naturally limited length.

Filament: can be natural (secreted) or man-made. The long thread-like fibers are extruded in continuous lengths.

Interlacing: interworking of elements where each element simply passes under or over elements that cross its path. Can be constructed from a single set of elements (i.e., braiding or oblique interlacing) or from two or more sets (weaving).

Interlinking: is a single element structure where elements twist around adjacent ones on either side creating a spiral effect.

Interworking: when separate elements systematically interwork to form a coherent material. The particular nature and order of the interworking is what distinguishes one textile structure from another.

Looping: is a single element structure where a loop is formed by the element crossing over itself as it moves on to form the next loop. Looped stitches are used in sewing, netting and lace-making (i.e., buttonhole stitch and the half hitch).

Plain twining: refers to simple twining when two active elements encircling another element with a half-twist between each passive element.

Plied yarns: yarn formed by twisting together two or more single yarns. A "two"-ply yarn is made up of two single yarns. A "re-plied" yarn is formed by twisting together two or more plied yarns. Emery (1966:10) restricts the term "plied" to yarns constructed of spun fibers. Drooker (1992:246) uses it to describe yarns made by twisting together any two or more elements, spun or unspun. This term is more appropriate for the yarns described in this research.

Sinew: tough strong animal fiber used for cordage.

Spaced twining: twining in which the rows of active twining elements are spaced more than the diameter of the twining element apart (Kuttruff 1988:185).

Spinning: the process of twisting together and drawing out massed short fibers into a continuous strand.

Sprang: a method of making a textile structure by manipulating parallel warp elements which are fixed at both ends. A textile structure is formed simultaneously at both ends as a result of the fixed warps. It is structurally indistinguishable from interlinking, interlacing or oblique twining, except for the finishing centre point which has to be joined (Collingwood 1974:31, Drooker 1992:246). Drooker (1992:246) notes that sometimes sprang textiles are cut along the resulting edge, in which case the construction technique cannot be determined.

Spun yarns: fibers of limited length which can be laid more or less parallel and then drawn out and twisted to produce length, size, strength and texture.

S-twining twist: twining in which the direction of the twining twist, when the active elements are held in a vertical position, conform to the slant of the central portion of the letter S (\) (Kuttruff 1988:185).

Textile: interworking of elements or sets of elements whether or not they are of woven construction (Kuttruff 1988:10-11). Emery (1966:xvi) defines textile only as an interlaced fabric.

Three-strand twining: can be done horizontally or vertically. In weft twining, one of three wefts, called the working strand, passes around its mates as it moves to enclose a warp group (Samuel 1987: 30).

Twining: textile structure in which one set of elements enclose one or more by twisting around them.

Twist: combining two or more elements by winding together.

Twist direction: designated as **S** or **Z** depending on the trend of the spiralling twisted elements. If a **S**-twist yarn is held vertical, its slant is downward and to the right (\), like the central portion of the letter S. If a **Z**-twist yarn is held vertically, its elements slant downward to the left (/), like the central portion of the letter Z (Drooker 1992:248).

Unspun: certain fibrous structures (i.e., fiber aggregates, fiber bundles) which are used more or less in their natural form without being broken down to ultimate fiber width. They are split or shredded for fineness and sometimes knotted together for length.

Warp: parallel elements that run longitudinally on a loom, frame or fabric, crossing at more or less right angles and interworked by transverse elements.

Warp count: the number of warp elements per centimetre (Drooker 1992:248).

Warp-faced: textile in which the weft elements are completely covered by warp elements.

Warp twining: twining in which the lengthwise set of elements is the active twining or spiralling set (Kuttruff 1990:185).

Weaving: warp-weft interlacing of two or more sets of elements.

Drooker (1992:248) notes that some sources restrict the term to fabric produced on a loom with heddles which lift warp threads automatically.

Weft: the transverse elements in a fabric (generally parallel to each other and to the terminal edges of the fabric) which cross and interwork with the warp elements at more or less right angles.

Weft count: the number of weft elements per centimetre.

Weft-faced: textiles where the warp elements are completely covered by weft elements. This can occur in interlacing and twining structures.

Weft twining: wefts are manipulated in such a way that they enclose successive warp elements as they twine about each other. Kuttruff (1990:185) defines weft twining as twining where the crosswise set of elements is the active twining or spiralling set.

Yarn: any assemblage of fibers or filaments put together into a continuous strand (Kuttruff 1992:188).

Z-twining twist: twining in which the direction of the twining twist, when the active elements are held in a vertical position, conform to the slant of the central portion of the letter Z (/).