

THE LATE PREHISTORIC PERIOD AT THE TURN IN KINGSWAY PARK,

MOOSE JAW, SASKATCHEWAN

A Thesis

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by

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ABSTRACT

This thesis discusses the archaeological resources at the Turn area of Moose Jaw, Saskatchewan, in light of two field seasons of investigations undertaken there in 1984 and 1985. Excavations recovered a Plains/Prairie Side-notched assemblage and an Avonlea assemblage which are described here. The implications of these assemblages are discussed with respect to the cultural chronology of the area and a typological description of Avonlea period ceramics is produced. The assemblage is also discussed with respect to current theories regarding the lifeways in the area during the Late Prehistoric period. It is proposed that the archaeological resources at the Turn, currently regarded as two sites (the Davies and Garratt sites) actually represent a single continuous site which covers the entire floodplain area at the Turn. It is further proposed that the occupations there represent campsite activities which took place over a variety of seasons ranging from early fall to late spring and possibly occasionally extending into the summer.

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1.0 INTRODUCTION

This thesis describes and interprets archaeological research undertaken on archaeological sites located at 'The Turn' area of the Moose Jaw River Valley, on the southern limits of the City of Moose Jaw, Saskatchewan (Figure 1). Field investigations undertaken by the author in 1984 and 1985 form the major emphasis of this thesis, although various earlier archaeological investigations undertaken at the Turn will receive consideration.

The archaeological sites investigated are actually a single large campsite on the Moose Jaw River floodplain, traditionally referred to as two separate sites - the Davies site (EcNj-6) and the Garratt site (EcNj-7). The presence of two other sites, a possible spring campsite on an adjacent river terrace called the Compass site (EcNj-11) and a possible kill site located downstream from the Turn called the Kenny site (EcNj-14), has some relevance in the discussion that follows, although neither are reported in detail in this thesis.

1.1 Project History and Constraints

The 1984 and 1985 field investigations discussed here were sponsored by the Wakamow Valley Authority (WVA). The WVA is the agency charged with resource management in the Moose Jaw River Valley, within the confines of the city of Moose Jaw. The study area, the Turn, is located in Kingsway Park, which is under the direct control and management of the WVA. The WVA was aware of the



Figure 1: Study Area

- EcNj-6 - Davies site
- EcNj-7 - Garratt site
- EcNj-11 - Compass site
- EcNj-14 - Kenney site

presence of archaeological resources at the Turn, and knew that these resources have been subject to considerable destruction caused by various residential, agricultural and developmental projects, natural and man-made erosion, and collecting activities. The WVA therefore initiated archaeological investigations at the Turn with the following resource management objectives in mind: (1) to salvage a portion of those archaeological resources presently being destroyed or in danger of destruction; and (2) to provide an information base for preservational and public interpretation purposes.

The resource management objectives of the WVA established the parameters for the archaeological investigations at the Turn. To a great extent, these objectives also set certain constraints on the project. The most obvious was the salvage objective, which prioritized investigations to endangered areas of the sites. The constraints resulting from the second objective are less obvious, since 'information base' can be interpreted in a variety of ways. However, for preservational purposes, such a base must emphasize spatial limits and condition of resources. In the case of an area as large as the Turn, this implies maximizing the area covered and minimizing 'in depth' investigations in any one location.

A number of other practical constraints operated on the project. Large areas of the Turn had been subject to extensive disturbances, to the extent that the archaeological resources in those areas were destroyed or of limited value. Furthermore, one rather substantial portion of the inner floodplain area of the Davies site was under a

wheat crop during the 1985 field season, and thus was off limits to any archaeological investigations. Finally, the inner floodplain portion of the Garratt site had been subjected to extensive archaeological excavations in the past, and sufficient information on that area had been gathered to make it a low priority in terms of further investigations.

Given the resource management objectives, and the practical constraints listed above, the following methodological approaches were used:

1. mapping and surface collecting of the entire area;
2. testing throughout the area, concentrating on the more intact riverbank portion of the sites; and
3. concentrating on a portion of the riverbank area already eroded by backwash from the Grayson Dam, and subject to further seasonal erosion.

The challenge was to develop a research design and research goals suited to this basic methodological approach. To proponents of the deductive approach, this may appear to be a backwards way of setting up a research project. However, present-day archaeology is becoming aware of a dwindling resource base, and a duty to take responsibility for the management and investigation of those resources. Salvage/resource management approaches are increasingly gaining in both acceptance and importance.

Two primary research goals were formulated:

1. to refine the cultural chronology of the area for the Late Prehistoric period, and

2. to establish a model for the prehistoric lifeways at the Turn. The specific directions which these very general goals took were determined by several factors: perceived weaknesses of present knowledge about Saskatchewan prehistory; previous hypotheses about the cultural chronology and prehistoric lifeways of the area (which required consideration, elaboration or testing); and the nature of the archaeological resources themselves. These are discussed in the next sections of this chapter.

The following is an introduction to the research goals for the 1984/1985 investigations of the Turn and for this thesis. The relevant theoretical background and their application to the archaeological resources at the Turn will be discussed in later chapters, once the relevant data have been described.

1.2 Problem One: Cultural Chronology - The Need To Establish Multiple Diagnostic Markers for Saskatchewan Prehistoric Complexes

One of the main theoretical approaches taken here, and indeed the major one used in Saskatchewan archaeology, is the cultural historical approach. This seeks to establish local and regional typologies and to arrange these in chronological sequences for a 'culture history' of the area. This approach has a normative framework, using artifacts as concrete representations of the norms of a group. Although each artifact is actually the product of an individual idea or 'mental template', it can be classified together with similar artifacts under a 'type' which is deemed roughly

representative of the norm for that kind of object held by the group which produced such artifacts. The total assemblage of artifact types left behind by a group is the archaeological representation of that group's culture.

Saskatchewan archaeology and, to a certain extent, that of the Northwestern Plains, has been dominated by a uni-dimensional approach where the projectile points serve as temporal and cultural markers. With a few commendable exceptions (Meyer 1981), ceramics, bone tools and even other lithic tools have taken a back seat. Although such items are normally described as a part of a particular assemblage at a particular site, their use in regional chronologies has been limited. This is especially unfortunate with respect to ceramics, whose plastic nature makes them sensitive to stylistic trends, and which have been extensively used as temporal and cultural markers elsewhere.

This emphasis on point styles is a developmental stage in Saskatchewan archaeology. Ceramics are present only in the Late Prehistoric period assemblages. Within that time period, the earliest cultural complex, the Besant complex, has yielded relatively little associated ceramics. Although the association of ceramics with the Besant complex has gained some acceptance (Dyck 1983:120; Reeves 1983:9), there is a lack of good in situ association. When this is present, the paucity and poor condition of the sherds generally limit their use to a presence/absence marker (Quigg 1986b; Loveseth 1983). There is, therefore, a need for the documented recovery of ceramic remains in good stratigraphic association with a

Besant cultural occupation, and in adequate quantity and condition to allow for proper description.

The later cultural complexes of the Late Prehistoric period, (the Avonlea complex and the Prairie/Plains Side-notched or Old Women's complex) are well established in terms of ceramic presence in the artifact assemblage. An adequate number of diagnostic traits has been documented for those complexes but the literature lacks a good, up-to-date description of the ceramic types associated with each cultural complex, and of the temporal and geographical range of the variant types.

Although the creation of a multidimensional typology will require far more research, the establishment of a ceramic typology to supplement the projectile point sequence would be a step in the right direction. Once this and other supplemental typologies are established, any of them could be used to identify a particular 'archaeological culture', and no one artifact type alone should be considered absolute evidence that a site belongs to any particular culture.

The archaeological investigations at the Turn were originally undertaken with the possibility of finding Besant ceramics, since the recovery of Besant-associated ceramics had been reported for the excavations by the Saskatchewan Museum of Natural History (SMNH) at the Garratt site (Morgan 1979). Unfortunately, no Besant occupation was located in the 1984/1985 excavations. However, stratigraphic information gained does warrant a reconsideration of the Besant-ceramic association at the Garratt site. Since that association is

frequently cited as a case for Besant ceramics (Dyck 1983, Morgan 1979, Reeves 1983), it will receive some further discussion in later chapters.

An Avonlea component at the Davies site was investigated during the 1985 field season, and a large quantity of fairly well preserved ceramics was recovered. In addition, the ceramics recovered by the SMNH archaeological investigations, described in Morgan (1979), show some interesting variations which warrant further attention. Furthermore, the description of Avonlea complex ceramics is a relatively tidy problem, since there is more consistency, both within and between the known variant types than is evident with the ceramics of the later Prairie and Plains Side-notched periods. Finally, a number of documented excavations of ceramic-bearing Avonlea components within the last five years or so has greatly expanded the relevant data base. For these reasons, Avonlea complex ceramics will be explored in depth here. The Avonlea component ceramics from the Davies and Garratt sites will be compared to those found associated with Avonlea elsewhere, and this comparison will be used to formulate a basic description of Avonlea ceramic types. Temporal and geographical distributions of the variant types will be discussed. Ceramics were also recovered in the Prairie/Plains Side-notched component of the Davies and Garratt sites. However, the ceramic bearing strata for that complex investigated by this project were beset with either stratigraphic problems or unacceptable radiocarbon dates. These problems will be further described elsewhere in this report. The Prairie/Plains Side-notched component recovered from the

SMNH investigations at the Garratt site was largely in the plough zone or otherwise disturbed (Morgan 1979). Furthermore, the ceramic assemblage associated with this complex elsewhere on the Northwestern Plains shows a good deal of variation and internal complexity. As a result of these problems, the issue of ceramic typology for the Prairie/Plains Side-notched complex is considered to be beyond the scope of the research undertaken here. The relevant ceramic assemblage at the Turn will therefore be dealt with briefly, with an emphasis on ceramic types present.

For the purpose of this thesis the emphasis in terms of cultural chronology will be on the Avonlea complex, specifically the ceramics associated with that phase.

1.3 Problem Two: Lifeways - Establishing A Model For Prehistoric Use Of The Turn Area Of The Moose Jaw River Valley

When investigating an archaeological site, a number of stock questions are normally asked. These include: when the site was occupied, by whom, for how long, and what the functions of the site were. These will all be dealt with, to the extent that the data recovered allows. Results of the 1984/1985 investigations at the Turn recovered very little lithic remains, especially of formed tools. Few features could be expected to be encountered, given the limited size of the excavation blocks. However, it quickly became evident that faunal remains would form a large portion of the archaeological assemblages, especially of the Prairie/Plains Side-notched occupations. Therefore, hypotheses regarding the prehistoric

lifeways at the Turn had to be based largely on the interpretation of the faunal remains.

Morgan (1979) interpreted the Garratt site as a winter campsite. With respect to seasonality, the faunal remains recovered by this project were examined in light of Morgan's hypothesis. The small scale of the 1984/1985 excavations at the Turn precluded any extensive aging and sexing studies, and the majority of the faunal remains from the SMNH excavations were unavailable for analysis. However, the faunal assemblage recovered in the 1984/1985 investigations was examined for foetal remains, as well as the remains of those animals whose presence in the area might be seasonal. Furthermore, some of the excavation areas were extensively sampled for paleobotanical remains, and the seasonality of the occupations are discussed in light of the results of the paleobotanical analysis. Finally, the nature of those features that were discovered, as well as site location and the nature of the local terrain are all used to make certain inferences about seasonality.

Morgan's interpretation (1979) of the function of the Garratt site as campsite was based on the recovery by the SMNH project of hearth features, ceramics and lithic debitage. On the other hand, Emerson (1981) examined the SMNH Garratt site faunal assemblage using Binford's models of faunal assemblage composition (Binford 1978), and found that it most closely matched the pattern predicted for kill sites. The 1984/1985 project faunal assemblage for the Turn were examined within the framework of Binford's models, and the results are discussed in the light of this apparent conflict in the

aforementioned functional interpretations of the Garratt site.

Finally, special attention is given to the question of the importance of the Turn for the prehistoric occupants. To what extent did the resources there affect prehistoric lifeways in the area?

The prevailing notion has been that of a nomadic but regular seasonal round following a predictable bison seasonal migration to the grasslands in the summer and the parklands in the winter (Arthur 1975, Morgan 1979, 1980, Oliver 1962). This model has received some criticism, both in terms of the predictability of the bison seasonal round (Hanson 1984) and the lack of attention to non-bison food resources (Smith 1986). This problem will be discussed in terms of the inferred seasonality of the prehistoric occupations at the Turn, as well as the nature of the faunal assemblage recovered there.

Prehistoric use of the non-faunal resources will also be examined, and some inferences will be made regarding their importance to lifeways in the area. This will include a discussion of the use of the flora of the area as reflected by the palaeobotanical analysis of the Davies site, and an examination of the lithic raw material recovered from the sites in terms of local versus exotic origins.

2.0 THE STUDY AREA

The Moose Jaw River Valley has long been a favored spot for both settlers and travellers. The portion of the valley directly south of Moose Jaw offers a number of special attractions. The twisting river has created a floodplain valley complex that is well sheltered and lush in vegetation. Prehistorically, these features provided an ideal environment for animals. The presence of animals, as well as the sheltered nature of the valley and easy access to water, were obviously a major drawing card for human occupation. Furthermore, the fact that the Moose Jaw River provided access to the Qu'Appelle Valley network trading routes, ensured the continued human occupation of the area.

This area has also been a preferred spot during historical times. The valley provided shelter for a band of Sioux refugees from the United States after the 1876 Sioux rebellion, until their relocation to the Wood Mountain Reserve in 1913 (Laviolette, 1944:120). Subsequently, the area was a popular spot for both summer cottages and permanent residences of the Moose Jaw community. However, periodic and relatively severe flooding of the valley makes the area unsuitable for permanent residence structures; the valley has recently been zoned as a recreation and preserve area, managed by the Wakamow Valley Authority.

2.1 Geographical Location

The study area is located in Kingsway Park, along a section of the Moose Jaw River directly south of residential Moose Jaw (see Figure 1). In legal terms, this area corresponds to Sections 28 and 29 of Township 16, Range 26, West of the 2nd Meridian. It is traditionally referred to as 'The Turn', because of its situation at the point where the Moose Jaw River makes a major change in direction from northwest to northeast.

As previously mentioned, the 1984/1985 archaeological investigations described here concentrated on two sites located at the Turn. The Davies site (EcNj-6) and the Garratt site (EcNj-7) constitute almost the entire floodplain north and west of the river at that point. Two other nearby sites will receive some consideration here, in as much as their presence relates to the sites at the Turn. The Compass site (EcNj-11) is located on an adjacent river terrace to the southeast. The Kenny site (EcNj-14) is located approximately 500 meters south of the Turn, on the floodplain on the opposite bank of the Moose Jaw River. Figure 2 gives the locations of these sites.

2.2 Physiography

The Moose Jaw River is part of the Qu'Appelle spillway complex. This complex is a major feature of the Qu'Appelle Plains, a physiographic division of the Saskatchewan Plains Region of the Central Lowlands Province (Richards and Fung 1969: 40-41). The Missouri Coteau lies directly to the southwest, and the Regina Plain

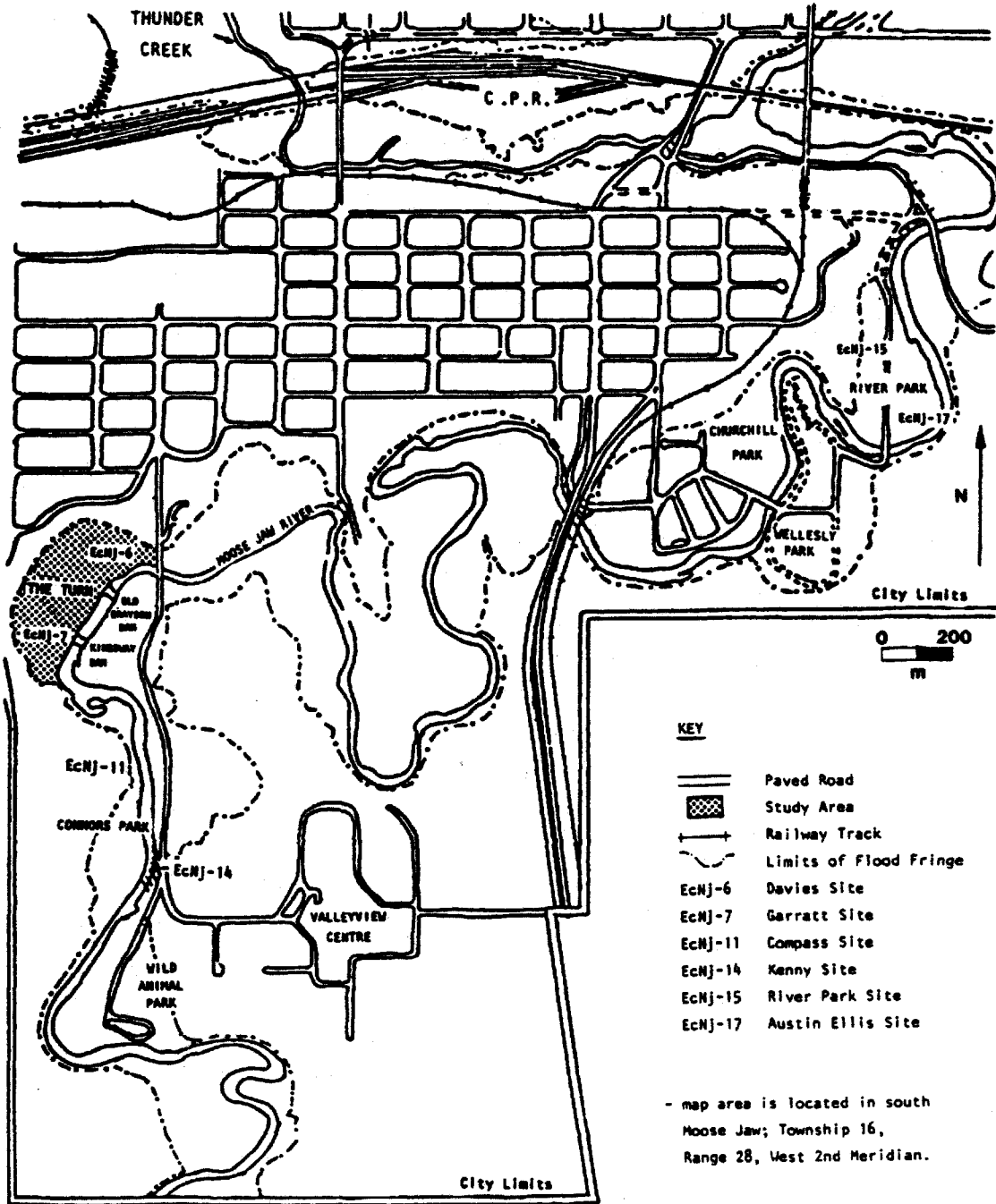


Figure 2: Archaeological sites in the Moose Jaw Area

to the east.

Water has been the major land forming agent within the area. The surrounding uplands were formed from heavy clays deposited by Lake Regina during the last glacial retreat episode (Reid et al. 1979: 35). The river valley, where the major portion of the investigations was concentrated, was formed by fluvial processes resulting from the drainage of Lake Regina. This left a wide valley with gently to steeply sloped valley walls and a number of river terraces.

The present Moose Jaw River is classified as underfit, being much smaller and less powerful than the glacial lake run-off which originally excavated its channel (Reid et al. 1979: 35). The river, therefore, is very slow-moving and meandering. In fact, the term 'Wakamow' was adopted from the Plains Cree word for 'turn', or 'bend in river'.

The width of the valley, the slow current, and the sedimentary nature of the lacustrine deposits within which the river channel is located have combined to create a series of floodplains. Flooding is frequent within the study area. The elevation of the floodplain above the river level varies from 30 centimeters to 3 meters. The lower reaches can be expected to be flooded almost annually, whereas the higher areas are much less frequently flooded. The major portion of the study area is located within the designated floodway, with minor portions in the designated flood fringe. The last three major floods in the Moose Jaw River Valley occurred in 1948, 1969 and 1974 (Reid et al. 1979: 46-47).

The Moose Jaw area generally is characterized by lacustrine deposited brown and dark brown chernozemic soils of medium to fine texture (Harris et al. 1983: 38). However, the majority of the study area is located on the floodplain, which is subject to alluvial depositional processes. The soil at the Turn can be characterized, for the most part, as structured orthic Regosol (see Moss 1978: 64 for full description). Profiles consist of a series of thin A horizons interspersed by moderate to fine-textured C horizons (organic horizons interspersed with horizons of interbedded silt, sand and clay). Soil development is poor due to frequency of flood deposition. B horizons are usually absent or indistinguishable.

2.3 Climate And Vegetation

The climate of the region is dry, with hot summers and cold winters. This results in a certain seasonality in the natural resources in the area. Much of the wildlife that inhabits the open grasslands in the summer tends to either migrate elsewhere or withdraw into the sheltered valleys during the winter.

The Moose Jaw River valley is situated within the Mixed Grass Prairie Ecodistrict of the Grassland Ecoregion. The uplands of this district are characterized by a number of grasses and herbs, dominated by spear grasses (Stipa comata and S. spartea), wheatgrasses (Agropyron dasystachyum and A. smithii), and June grass (Koeleria cristata) and by low blue grama (Bouteloua gracilis) and thread-leaved sedge (Carex filifolia) on south-facing slopes (Harris et al. 1983: 38).

The Moose Jaw River Valley once again offers a variant situation within the overall ecodistrict - that of valley forest and brush patches. Traditionally, such areas should be dominated by willows (Salix spp.), saskatoon (Amelanchier alnifolia), chokecherry (Prunus virginiana), snowberry (Symphoricarpos occidentalis), wolf willow (Elaeagnus commutata) and pasture sage (Artemisia frigida) (Harris et al. 1983: 38). Kingsway Park, having suffered considerable impact by human occupation, has little of the original vegetation community. During the settlement period, much of the tree growth of these areas was stripped to provide wood for fuel, fencing and rails; land was later cleared to accommodate residential development.

Presently, a portion of the Turn area is given over to stretches of overgrown lawn and ornamental tree cover such as northwest poplar, scotch pine, golden willow, Colorado spruce and the native Manitoba maple and green ash (Reid et al. 1979: 27). A significant portion of the Turn was once cultivated as a market garden, and is covered by weeds; the entire area is mowed at various times during the summer, maintaining the community at the 'weed' stage and preventing forest recovery (Hanley 1983: 39). This area was cultivated to wheat during the summer of 1985, with poor results. Apart from a marsh area surrounding the remains of an oxbow lake, the remainder of the Turn is characterized by a second growth river bottom forest. These areas are dominated by manitoba maple (Acer negrundo) and green ash (Fraxinus pennsylvanica) with occasional cottonwoods (Populus deltoides) and peachleaf willow (Salix amygdalerides), as well as red osier dogwood (Cornus

stolonitera) and willows (Salix lucida and Salix discolor) as understory growth (Reid et al. 1979: 27). It is these areas of second growth which most resemble the aboriginal vegetation of the area, and which serve as the best reconstruction for the prehistoric environment. A complete flora species list for the Turn area of Kingsway Park was compiled by Hanley (1983). This list plus a more detailed description of the natural second growth areas is included in Appendix I.

From these least disturbed areas of the Turn, a picture can be reconstructed of an originally abundant vegetation community providing a variety of resources for human exploitation. Wood for fuel, shelter and numerous other uses was in good supply. In addition, the valley offered an assortment of berries such as saskatoon and chokecherry. Dan Kennedy, a recent chief of the Assiniboins identified one other vegetable resource once native to the Turn:

Moose Jaw and its locale was our hunting territory. It was more familiarly known as Pangi Oka - "Potatoe Diggings" - as we used to dig the sweet potatoes at the big bend in the Creek. Whenever we happened to be in the vicinity in the buffalo days, we never failed to make a bee-line to the great bends of the Moose Jaw Creek to dig those delectable sweet potatoes which grew in profusion there. (Knight 1976: 2).

It is uncertain what species Kennedy is referring to. It may be the 'pomme blanche' which Lowie (1909: 12) mentions in reference to Assiniboin use of 'vegetable products'. According to Kaye and Moodie (1981: 82), the term 'pomme blanche' was used by French Canadian fur traders in reference to Psoralea esculenta. Denig (1930: 408) refers to the use of the 'prairie turnip' (Psoralea esculenta) by the

Assiniboin. Hind gives the Sioux name for this species as 'Tip si na' (1971: 319). Denig gives a similar Sioux term for the prairie turnip, 'teep se nah', but he also mentions the use of the wild artichoke, which the Sioux call 'panghai' (1961: 11). Given the resemblance between this Sioux term and the term 'Pangi Oka' used by Dan Kennedy, the Assiniboin informant, there is a possibility that the 'sweet potato' he is referring to is the wild artichoke or Jerusalem artichoke (identified by Ewers as Helianthus tuberosis in his footnote to Denig's text). Denig states that these plants "grow in abundance along marshy spots of the river banks" (1961: 11), an environment consistent with that at the Turn. Furthermore, Helianthus tuberosis is sweet to the taste and the edible portions of the plant grows as tubers. It therefore resembles a sweet potato more closely than the Psoralea esculenta, which is a root plant resembling a long turnip. However, the present range of the Jerusalem artichoke is limited in Saskatchewan to the Souris River valley (Maher et al., 1979). It is possible that the prehistoric/protohistoric range did take in the Turn area (Vernon Harms, personal communication, 1989), but it is also possible that the term 'pangi' or 'panghai' had degenerated to a generic term for 'potato-like plant'. In his inventory of species currently present at the Turn, Hanley (1983) does not identify either species, and none of the species he does identify resemble anything that could be considered a 'sweet potato' or 'prairie turnip'. Similarly, the vegetation transect provided as an appendix to Morgan's report on the Garratt site (1979: 247-249) does not mention either species or any

similar tuber. It is possible that a root plant of that nature could either have been missed during both inventories or may have died out in the area since the 'buffalo days'.

2.4 Fauna

Human habitation and urban growth in and around the study area has greatly affected the original animal community there. Some species, such as the bison, have been eliminated, whereas several small rodent species have probably multiplied (Richards and Fung 1969: 82). However, the animal community can be safely assumed to have been relatively rich, and much like other wooded riverine/floodplain communities of that ecodistrict.

White-tailed deer (Odocoileus virginianus) and mule deer (Odocoileus hemionus) are common to the Mixed Grass Prairie Ecodistrict (Harris et al. 1983: 40), and could be expected to winter in the shelter of the river valleys, as could bison (Bison bison) and elk (Cervus canadensis) (Morgan 1979: 102-106). Similarly, a variety of rodents and other small animals native to the area, as well as their predators, will usually take advantage of the shelter and water supply of the river valleys (Long 1980: 67). In addition, a number of water-based animals, such as the beaver (Castor canadensis), muskrat (Ondatra zibethicus) and river otter (Lutra canadensis), and water fowl such as the Canada goose (Branta canadensis), mallard (Anas platyrhynchos) and bittern (family Ardeidae), as well as a variety of fish, can all be found in and around the river itself. With both the riverine and grassland communities congregating there,

the Turn was probably densely populated with a large variety of fauna.

J. A. Calder commented on the abundance of game in the surrounding area in the early 1890's (Turner 1972: 58):

When living at Moose Jaw my chief hobby was hunting. In the surrounding and adjacent countryside and adjacent lakes there was an abundance of game, chiefly prairie chicken, duck and geese. At that time, the Canada Goose migrated about 20 miles north of the town. They came by tens of thousands and chose this lake and the wheat-fields south of it as their resting and feeding place for a period of from four to six weeks.

Although it is impossible to totally reconstruct the faunal population of the prehistoric periods at the Turn, for the purposes of this thesis it is assumed that the prehistoric animal populations generally resemble that described above unless otherwise indicated in the archaeological faunal assemblage.

2.5 History of the Study Area

Early historic references to the Moose Jaw area are infrequent, since it lay well to the south of the Saskatchewan River water route used by early explorers, traders and missionaries. This area is generally thought to have been inhabited by the Assiniboin groups in the early 1700's (Brink 1986a: 57). Denig's map of tribal distribution on 1855 has the Assiniboin further south in the vicinity of Wood Mountain, and the Crees occupying the Assiniboin and Qu'Appelle river systems as well as the region to the north (1961: xxv-xxvi).

Scace describes some of the earliest historic visits to the area

(1979: 8-16). Members of the Palliser Expedition were the first to map the Moose Jaw Creek (River) in 1857, but they crossed the Moose Jaw River and turned westward to follow the foot of the Missouri Coteau at a point north of the Turn, somewhere near Mortlach (Spry, 1968: 139-140). Henry Youle Hind passed the confluence of the Moose Jaw River with the Qu'Appelle valley in July of the following year (1971: 338) and noted a tipi ring site "on the banks of the Qu'Appelle valley near the 'Round Hill' opposite Moose Jaw Forks". He attributed this site to an ancient encampment of the Plains Cree, and mentions coming across a Cree group of fifty to sixty individuals in the vicinity (1971: 338). The Moose Jaw area was surveyed by the Dominion Land Surveyors in the early 1880's (Canada, Department of the Interior 1887), and James Hamilton Ross and party camped at the Turn in July of 1881, noting "a camp site at the crossing of the old Hudson Bay trail from Fort Qu'Appelle to Fort Walsh" (Moose Jaw Times-Herald, June 6, 1933). Charles John Brydges of the Hudson's Bay Company passed by the area in 1882, turning west at Thunder Creek to the north of The Turn (Bowsfield, 1977: 233).

The earliest historic record of residence at the Turn comes from Isaac Cowie, who describes lodging with a Paul and Xavier Denomie in their wintering cabins, which he refers to as the 'Hotel Denomie', for several days in the winter of 1875 (1913: 248).

The earliest farming settlers arrived in January of 1882, headed by the previously mentioned James Hamilton Ross, and a second party headed by Henry Battell arrived in March of 1882. The first railroad reached Moose Jaw in the summer of 1868 (Knight 1982: 1-4).

From what I can gather from Leith Knight's discussion of the homestead period in Moose Jaw (1982), none of the early farmers homesteaded at the Turn. The next residents in the valley would therefore be a group of Sioux Indians under the leadership of Black Bull, who had apparently participated in the Custer massacre, fled to Canada, lived in the Wood Mountain area until the buffalo disappeared and then moved to Moose Jaw (Laviolette 1944: 119-120). Laviolette reports that "In 1882 they had a permanent camp in the valley near Moose Jaw" (1944: 120), which Leith Knight has identified as being at the Turn (1977: 13). Private O'Donnell, a member of the Halifax Provisional Battalion stationed in Moose Jaw in 1885 wrote to his parents:

There are almost 80 Indians encamped about four miles from our camp....in a splendid valley surrounded by hills, and there is a fine large brook (Moose Jaw River) running through their camp. There are twenty tepees in which they live, and it is a pretty sight to stand upon the hills and look down and see Indians riding their ponies of which they have lots, the squaws going from one tent to another...the papooses playing around with their bows and arrows, shooting at birds. They make and sell moccasins, war clubs, pouches and hair chains. Some of them speak a little English. They are Americans of the Sioux tribe and were in the General Custer massacre...
(Knight 1982: 11).

Private William Tupper of the same battalion wrote to his parents that the encampment numbered 30 tents (Knight 1982: 11). Laviolette refers to the group earning a livelihood by working in the village (1944: 120), and Knight mentions the employment of the women of the Sioux encampment to scrub the rooms of a makeshift hospital set up in the Moose Hotel during the northwest Rebellion in 1885 (1981: 12), and the employment of a Moose Jaw Sioux called 'Nunpakite', also

known as 'Big Joe' and 'Joe Ferguson' at an early butcher shop owned by Hugh Ferguson (1981: 31). A photo of Nunpakite and his wife, taken by the RCMP at Wood Mountain, appears in Laviolette (1944: 125). John Maclean mentions making frequent visits to the Sioux camp at Moose Jaw (probably in the late 1880's). He describes them as being:

...industrious even in their unsettled condition, the women working in the town at whatever they could find as washer-women, and the men splitting and sawing wood or helping occasionally on the farms during harvest... Along the line of railroad a precarious livelihood is obtained by them, in polishing buffalo horns and making moccasins, which they sell to the travelling public. (1896: 108)

MacLean also mentions the death of "the son of the Sioux chief of the band of Moose Jaw" in the spring of 1888, and describes the burial scene:

...the deceased was placed in a coffin covered with red cloth and deposited upon a platform raised about ten feet in the air, on four stout poles. When the body was placed on the platform, a horse belonging to the deceased was tied by the tail to one of the posts, and shot. I saw the bones of the animal under the scaffold, the dogs having eaten the flesh. A large and a small coffin, trimmed alike, were lying on the scaffold... (1896: 116).

A reserve at Wood Mountain (Wood Mountain Reserve, No. 160) was granted to the Moose Jaw Sioux in 1913, and confirmed by Order-in-Council No. 1775, dated August 5, 1930 (Laviolette, 1944: 120, 123). However, according to a former resident of Moose Jaw, Harry Bay (now living in Brookland Center, Minnesota), the Wood Mountain Sioux used to return to Moose Jaw in the summer during the late 20's and 30's, to compete in the local rodeo. He remembers them being camped on the river terrace directly south of the Turn (the location of the Compass

site), where he and his brother would visit the group and were allowed to water the horses. However, he also recalls an incident when he came upon the 'chief's' wife, Emma (whom he remembers as having only one eye) chopping meat in the bushes at the Turn (Harry Bay, personal communication, 1985).

In 1912 Grayson's Dam was constructed at the northeastern end of the Turn (Reid et al., 1979: 13). From 1916 to 1934 the Moose Jaw Electric Railroad ran through the Turn en route to Connor's Park. The first permanent residences at the Turn began to appear in the early 1920's, and most remained up until the mid-1970s. The area of the Turn which is now a ploughed field was farmed as a market garden during roughly the same period. After the 1974 flood, residential and business activities at the Turn gradually ceased, and eventually zoning laws restricted further development in such flood prone areas (Doug Cole, personal communication).

2.6 Previous Archaeological Research At The Study Area

The study area, and the Moose Jaw area in general, had never been subjected to a systematic survey prior to our 1984 inventory (Krozser, 1985). Sites known in the area had all been reported by local collectors and history buffs. The Moose Jaw Museum Committee, the Moose Jaw Natural History Society and local collectors are all quite active and four prehistoric sites and three historic sites within a two kilometer radius of the Turn had been registered prior to the 1984/1985 investigations. Three of these sites are located within the study area: EcNj-6 and EcNj-7 (the Davies and Garratt

sites) are part of a prehistoric campsite at the Turn, and ECNJ-5 is a pair of Metis cabins reportedly once located at the Turn. Two other historic sites, ECNJ-1 and ECNJ-4 are reported burials at the surrounding prairie level, associated with the historic Sioux occupation at the Turn. The exact locations of ECNJ-1, ECNJ-4 and ECNJ-5 are unknown. The other two prehistoric sites, ECNJ-2 and ECNJ-3, were not investigated; they may or may not be associated with the archaeological resources in the study area.

Unfortunately, the majority of these reported sites are unconfirmed (ECNJ-1, ECNJ-3, ECNJ-4 and ECNJ-5), only two have been tested (ECNJ-6 and ECNJ-7), and only one systematically excavated (ECNJ-7) previous to the 1984/1985 investigations.

The Garratt site (ECNJ-7), was discovered by Paul Garratt in 1966. The site was subsequently inspected by a team from the Saskatchewan Museum of Natural History, led by Gil Watson, and was excavated by the same team in 1966, 1968 and 1969. Preliminary reports on these investigations by Watson (1966, 1968, 1969) and Don Pingert (1967) appeared in the Saskatchewan Archaeology Newsletter. Grace Morgan produced a more detailed report on the SMNH excavations at the site in 1979. The lithics from the Garratt site were included in a study by Marvin Thomas (1983) on lithic raw material selection in the Qu'Appelle Basin. The faunal assemblage from the site was included in a study by Alice Emerson (1981) on the applications of Binford's models (1978) of faunal assemblage composition to Plains bison assemblages.

The excavations by the SMNH recovered 462 chipped stone tools,

5,399 pieces of lithic debitage, 1,827 pot sherds, four bone tools, three shell tools, choppers, spall tools, hammerstones, and large amounts of bison bone, as well as deer, elk, Canis sp. and various small mammals. This collection is stored at the Saskatchewan Museum of Natural History in Regina. Three different cultural occupations were identified: an undated surface Prairie/Plains Side-notched component, a buried Avonlea component carbon-dated at 1450 +/-70 B.P. (S-406), 1280 +/-60 B.P. (S-408) and 6160 +/-100 B.P. (S-407: rejected by Morgan), and a buried Besant component dated to 1990 +/-75 B.P. (S-409) (Morgan 1979: 246).

The Davies site (EcNj-6), was reported in 1957 by Bill Davies of Moose Jaw. A portion of the Garratt site excavations by the Saskatchewan Museum of Natural History extended into the area commonly thought of as the Davies site. The site was further tested in 1983 by Pat Froese and Gil Watson of the Archaeological Resource Management Section of Saskatchewan Culture and Recreation. Investigations revealed numerous bone fragments, a few flakes and several 20th century artifacts from the upper 20 centimeters of four 70-centimeter-deep test pits (Pat Froese, personal communication, 1985).

Apart from reporting the sites discussed above, local collectors have been active in other ways. Leith Knight has a small collection of artifacts from the Davies site (Figure 3). A display in the Moose Jaw Art Museum (Figure 4) contains artifacts collected by Austin Ellis, including a set of points identified as coming from "9th Ave. S.W.", which is the street bordering the Turn to the west.

The 1984 investigations sponsored by the Wakamow Valley Authority consisted of an inventory survey of a number of river valley park areas, one of which was the Turn. The Compass site (EcNj-11) and the Kenny site (EcNj-14) were located during this survey. Two additional sites were located in River Park to the northeast of the Turn, the River Park site (EcNj-15) and the Austin Ellis site (EcNj-17). In addition, approximately three weeks of the 1984 field season were spent in preliminary sampling at the Davies and Garratt sites.

The 1985 investigations were concentrated on further sampling and some minor block excavations at the Davies, Garratt and Compass sites. This thesis will deal with the results of the investigation at the Davies and Garratt sites.

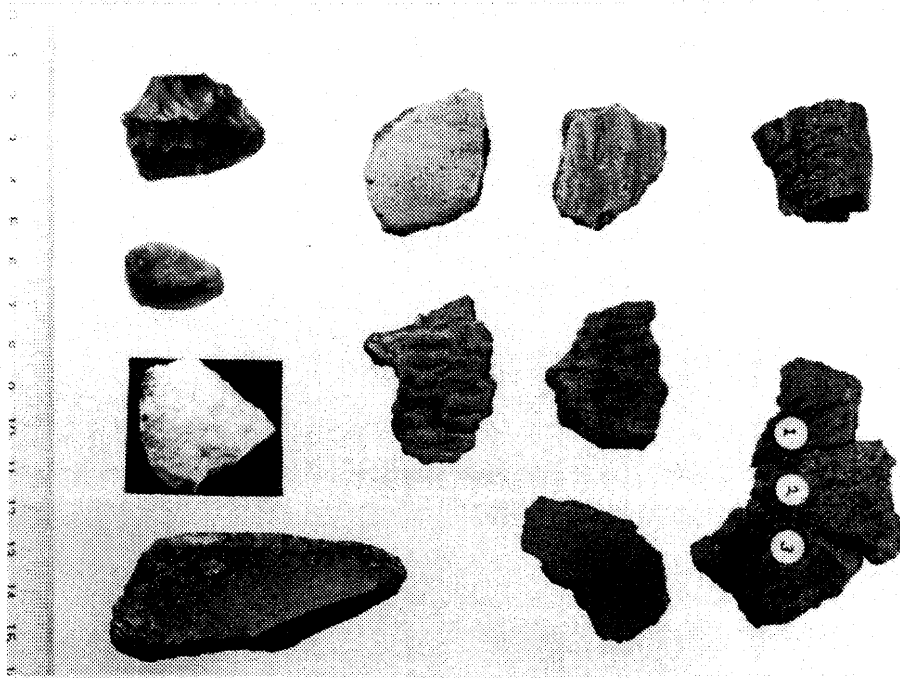


FIGURE 3: Leith Knight's collection from the Davies Site.

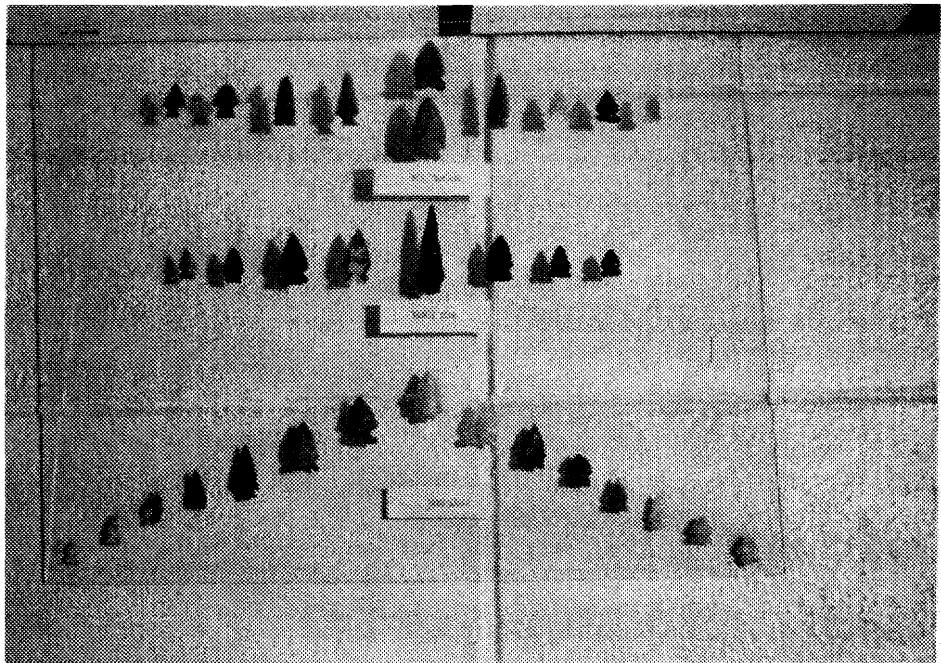


FIGURE 4: Projectile point collection from River Park, Ross School and 9th Ave. S.W. Photography courtesy of Moose Jaw Art Museum.

3.0 CULTURAL CHRONOLOGY OF THE MOOSE JAW AREA

3.1 Introduction

In order to place the archaeological resources of the Turn in perspective, they are discussed in relation to a schematic chronology for southern Saskatchewan. The chronology used here is adapted from Ian Dyck (1983). Some alterations have been made regarding the timing of geological periods, and Dyck's fourth period is referred to in this thesis as the 'Late Prehistoric Period' rather than the 'Late Plains Indian Period'. His four main cultural periods are summarized below:

1) Pleistocene Hunters Period (17,000 B.P. to 10,500 B.P.)

This period occurred during the Pleistocene epoch, during and after the retreat of the Wisconsin glaciation. Cultural complexes normally assigned to this period include a Pre-Clovis series and the Clovis complex. The identification of a Pre-Clovis diagnostic assemblage in North America is not yet clear. Clovis is characterized by large, lanceolate spear points, with a flute extending between one-quarter to one-half of the length of the point. Cylindrical bone foreshafts with tapering ends are sometimes associated with Clovis points. The Pre-Clovis and Clovis technologies are thought to have centered around the hunting of Pleistocene big-game fauna, such as the mammoth, bison, horse, camel and caribou (Dyck 1983: 70).

2) Early Plains Indian Period (10,500 B.P. to 8,000 B.P.)

This period began at the Pleistocene-Holocene transition and

witnessed the retreat of the spruce forest and the transformation of southern Saskatchewan into a relatively modern Prairie environment. Dyck includes in this period a Folsom/Midland/Plainview series, an Agate Basin/Hell Gap series, a Firstview/Alberta/Cody/Milnesand series (Scottsbluff and Eden points are included within the Cody complex), and a Late Lanceolate series including Fredrick, Lusk, Angostura, Browns Valley and possibly Jimmy Allen point types (1983: 66). Diagnostic of this period are larger, lanceolate spear points with either flutes or basal thinning, straight or round bases, or stems, depending upon the individual complex. Peoples of the Early Plains Indian period subsisted on plains game species with bison being the most common game animal.

3) Middle Plains Indian Period (7,700 B.P. to 1,850 B.P.)

This period occurred during the Holocene or modern epoch. Cultural complexes occurring during this period include the Mummy Cave series, and the Oxbow, McKean, Duncan, Hanna, Pelican Lake and Sandy Creek complexes. This period is associated with a change towards smaller projectile points, thought to be indicative of a switch from the use of spears to the use of atlatls.

4) Late Prehistoric Period (2,000 B.P. to 170 B.P.)

This period also occurred during the Holocene. Four cultural complexes have been assigned to it: the Besant, Avonlea, Prairie Side-notched and Plains Side-notched cultures. It is these complexes with which this thesis will be concerned. Dyck gives the age of the Besant complex as 2000 to 1150 B.P., the Avonlea complex as 1750 to 1150 B.P., and the Prairie and Plains Side-notched complexes as 1150

to 170 B.P., with the former lasting up until as late as 350 B.P. and the Plains Side-notched complex beginning around 550 B.P. All of these complexes are characterized by relatively small side-notched projectile points, which are probably used with the bow and arrow. All of these complexes are also associated with the use of ceramics. A more detailed description of this cultural chronology, with emphasis on the Moose Jaw area is presented below.

3.2 Pleistocene Big Game Hunters Period

Pre-Clovis finds have not turned up in Saskatchewan as yet, but Dyck feels there is a good chance that they may eventually be found in the southwestern part of the province (1983: 73). Clovis points have only been recovered as surface finds in Saskatchewan. Clovis points have been discovered near Prelate (Ee0i-1), Arran (EkMk-1), and McCord (DjNr-0 to DjNr-7) (Kehoe 1966: 530), as well as the Swift Current, Meota, Mistatim and Whitewater areas (Pettipas 1975: 4). A bone foreshaft of possible Clovis origin was found near Grenfell (Pettipas 1975: 4). There are no known accounts of Clovis finds in the vicinity of Moose Jaw.

3.3 Early Plains Indian Period

Folsom points are somewhat more prolific in Saskatchewan, although these are also all surface finds. They have been found throughout the southern half of the province, but the Moose Jaw area has produced a particularly large number of these points. The Mortlach area, 40 kilometers west of Moose Jaw, is described by

Pettipas (1975: 5) as "the most productive Folsom locale on the Canadian Plains". Twelve Folsom points were discovered there (Kehoe 1966: 533). Storck (1973: 4) documents a Folsom point (HKM-619) in the McKillop Collection at the Royal Ontario Museum, which reportedly was found in the vicinity of Moose Jaw. One Plainview point from the same collection (HKM-623) has also been described as coming from the Moose Jaw vicinity (Storck 1973: 5), and a possible Plainview from EcNk-1, approximately 10 kilometers west of Moose Jaw is housed in the SMNH collection (Dyck 1983: 75).

Agate Basin and Hell Gap points from Saskatchewan were until recently all surface finds. The Napa'o site, a buried site near Ponteix in southwestern Saskatchewan, produced a basal point fragment which appears Agate Basin-like, but could also be of the Scottsbluff tradition (Gil Watson, personal communication). The major recorded surface site for Agate Basin is the Parkhill site, nine miles south of Moose Jaw. It has produced 137 Agate Basin points (Ebell 1980: 4). A site in the Mortlach vicinity produced five Agate Basin points from the ventral region of a fossil bison skeleton (Pettipas 1975: 5). Two Hell Gap points in the previously mentioned McKillop Collection are labelled as Moose Jaw finds (Storck 1973: 5-6).

The Firstview/Alberta/Cody/Milnesand series have, so far, mostly been found on the surface in Saskatchewan, but in prolific number. There are no published accounts of finds near Moose Jaw which have been identified as Firstview. Stork (1973: 5) identified two Milnesand points from the McKillop Collection (HKM-848 and HKM-853) which were found near Moose Jaw. Ebell (1974: 21) discovered a point

he describes as "very likely a Milnesand point" from EcNk-1, west of Moose Jaw. It is interesting to note that this point was discovered from the vertical face of a pit, in a sandy layer, 2 1/2 feet below the surface.

A short-stemmed specimen, resembling an Alberta point, was found by Ebell (1974: 21) at EcNk-1. Ebell also found one Alberta and a possible Alberta point at EdNg-7 and EdNg-8, respectively, both from the Moose Jaw area (1971: 6-7). Phenix (1964: 6-7) notes the existence of Alberta points in the private collection of Kenneth Jones of Mortlach. Storck (1973: 10) identified one of the McKillop Collection points from the Moose Jaw vicinity (HKM-644) as being a possible Alberta point. The McKillop Collection apparently also contains a variety of the Alberta-related Cody complex material from the Moose Jaw area. Storck (1973: 10-11, 22) identified one 'variety-one' Cody knife (HKM-1062), and four possible 'variety -two' Cody knives (HKM-555; HKM-610; HKM-620; and HKM-854). Eleven Cody complex points have been identified from DjNf-8 near Omega, 100 kilometers southeast of Moose Jaw, and similar material was found at DjNf-1, four miles from this site (Ebell 1975: 1-2). Ebell also described an Eden and a Scottsbluff site in "south-central Saskatchewan", without giving a more precise location (1964: 1-2), as well as identifying a Scottsbluff point from EdNg-7 in the Moose Jaw area (1971: 6). The Niska site (DkNu-3), a buried Scottsbluff tradition occupation was recently excavated near Ponteix in southwestern Saskatchewan (Meyer 1985).

The Late Lanceolate series does not seem to be well represented

in the Moose Jaw area and Dyck does not identify any sites for the area (1983: 67).

3.4 Middle Plains Indian Period

Materials of the Middle Plains Indian period (the Mummy Cave series, Oxbow, McKean, Duncan, Hanna, Pelican Lake and Sandy Creek complexes) have been found throughout southern Saskatchewan in subsurface excavations as well as on surface sites. Since surface finds for this and the following period are too numerous to review here, the subsequent discussion will concentrate on buried sites which have been excavated, and especially on multi-component sites.

There are no known Mummy Cave series sites in the vicinity of Moose Jaw. Furthermore, no major excavated sites near Moose Jaw have produced Oxbow points. The nearest buried site for both is the Long Creek site (Wettlaufer and Mayer-Oakes 1960).

Wettlaufer's "Thunder Creek Culture" (1955: 58) at the Mortlach site (EdN1-1), directly east of Moose Jaw, has since been identified as Duncan (Dyck 1983: 101). Austin Ellis of Moose Jaw has a collection of McKean points from a surface scatter at the Big Kill site (EbNj-1), located approximately 50 kilometers southeast of Moose Jaw (Dyck 1983: 91, 102).

The Pelican Lake complex was first identified at the Mortlach site, being the second oldest buried cultural component at that site (Wettlaufer 1955: 54). The other major excavated site in the area which contains a Pelican Lake component is the Walter Felt site (EcNm-8), located approximately 60 kilometers west of Moose Jaw

(Watson 1967: 7).

The Sandy Creek complex was also first identified at the Mortlach site (Wettlaufer 1955: 50), in a buried component above the Pelican Lake occupation. The only other site in the Moose Jaw area containing a buried component of Sandy Creek is the Walter Felt site (Watson 1967: 7).

3.5 Late Prehistoric Period

This thesis will be mainly concerned with the Late Prehistoric period. Evidence for this period is scattered across the Saskatchewan prairie and parkland regions, and is quite numerous. This description, once again, places an emphasis on excavated components in the Moose Jaw area.

The Mortlach site is the type site for the Besant culture. A buried component there produced projectile points defined as Besant, as well as post-mould evidence for a dwelling (Wettlaufer 1955: 41-44). The Walter Felt site was the first site to reportedly produce ceramics in positive association with a buried Besant horizon (Kehoe 1964: 51). Unfortunately, the investigations at this site have never been reported in detail and the assemblage was taken out of the province. The oldest excavated cultural horizon at the Garratt site (EcNj-7) contained Besant projectile points (Watson 1966: 3). Testing in the same area, but actually closer to the Davies site (EcNj-6) produced pottery at a depth comparable to the Besant layer at the Garratt site (Watson 1969: 10), but the association has not been proven.

The Prairie and Plains Side-notched complexes are often lumped together; this may be because, being the most recent prehistoric cultural complexes, they are the closest to the surface and therefore the most likely to have their stratigraphic order disturbed. The Garratt site has a disturbed component containing both Prairie and Plains Side-notched points, as well as pottery (Morgan 1979: 264-294). Wettlaufer identifies both Prairie and Plains Side-notch points for the Mortlach site; however, the points he has identified as Prairie Side-notched in his illustrations (1955: 86-87; 90-91) resemble Plains Side-notched points in the opinion of this author. The Walter Felt site reportedly contained both Prairie and Plains Side-notched points, as well as check-stamped pottery "in the upper layers" (Watson 1967: 3).

3.6 Implications For The Study Area

The major conclusion that can be drawn from the overview presented here is that the Moose Jaw area contains an abundance of archaeological resources. The Pleistocene Big Game Hunters period is the only period not represented in this area, and aside from that period, the Late Paleo-Indian series, the Mummy Cave series and the Oxbow complex are the only other ones not well known here.

Second, the Moose Jaw area has contributed greatly to the establishment and description of the chronological sequence in Saskatchewan, and to a certain extent, the Northwestern Plains. A major locale for both the Folsom and Agate Basin complexes is found in the Moose Jaw area (the Mortlach area and the Parkhill site,

respectively). The Pelican Lake, Sandy Creek, Besant and Avonlea complexes were all first identified from sites in this area (the Mortlach and Avonlea sites). The Garratt site was the first site to offer a positive association between ceramics and the Avonlea complex, and the Walter Felt site was the first site to apparently do the same for the Besant complex. Finally, if my interpretation of Ebell's report on EcNk-1 is correct, one of the few buried cultural components in Saskatchewan known to predate the Middle Plains Indian period is located directly west of Moose Jaw, but not yet excavated.

Apart from the last-mentioned site, all the Early Plains Indian period sites in the Moose Jaw area are surface scatters. Since the study area is mostly located on a floodplain, and since the floodplain deposition in the area is relatively rapid and thick, sites of this and the previous period will be deeply buried and not likely to be located. Very deep testing would be the only means of encountering such occupations. Considering the extent of the study area, such a discovery would be by luck rather than by any systematic means of investigation. Cutbanks along the river, which often expose up to three meters of soil profile, offer the greatest opportunity for locating sites from the earlier periods. It should be noted here that, although the Wisconsin glaciation had receded from the Moose Jaw area by 14,000 B.P. (Dyck 1983: 71), it is unclear how long Glacial Lake Regina persisted in the area. Furthermore, the Moose Jaw River Valley was a major drainage channel for this lake and the study area may have remained submerged for some time after the lake had started to drain and the surrounding uplands were exposed. The

possibility remains, therefore, that the earliest cultural complexes are simply not present in the study area.

The earliest cultural component established for the study area is the Besant occupation at the Garratt site. Considering the evidence of the surrounding area, there exists a possibility that earlier complexes, such as Duncan, Pelican Lake and Sandy Creek, might be discovered in the study area, or at a greater depth at the Garratt site (although excavations at the Garratt site were extended to a depth of 2.3 meters in one instance, with no cultural material being discovered below the Besant occupation).

The Besant-Avonlea-Prairie/Plains Side-notched sequence has been established for the study area for the Garratt site. This sequence is found elsewhere in the Moose Jaw area, and is likely to be repeated in stratified sites found in the area. Ceramics were reportedly associated with all three cultural horizons in the SMNH excavations at the Garratt site. The Besant association is somewhat tenuous in this and other cases in Saskatchewan and the clarification of the Garratt site association would be valuable in the further establishment and description of this little-known ceramic horizon.

The chronology presented above is a brief summary intended to provide a framework for the data presented in the following chapters.

4.0 RESEARCH DESIGN AND METHODOLOGY

The research design and the resulting methodology for this project were necessarily influenced by the research interests of the author, by the nature of the archaeological resources at the Turn, and, above all, by practical and ethical concerns regarding the preservation and management of those archaeological resources. For example, an initial interest in establishing a typology for Besant period ceramics was abandoned since ceramics were not recovered in association with a Besant occupation. Because of the resource management concerns, most of the 1984/1985 excavation units were placed along the edge of the riverbank, where depositional processes may have buried any Besant occupation well below the scope of traditional and practical excavation techniques.

4.1 Research Design

The objectives of the 1984/1985 project, as discussed in the introduction, fall under two main categories: resource management objectives, and research objectives. Obviously, the objectives of this thesis correspond to the research objectives of the project. However, the resource management objectives are mentioned here since they partially dictated the methodology used for the project.

Resource management objectives were to salvage those archaeological resources presently being destroyed or in danger of destruction, and to establish an informational base for preservation

and public interpretation purposes.

Research objectives included elucidating the cultural chronology of the area for the Late Prehistoric period, and the establishment of a model for the prehistoric lifeways at the Turn.

These project objectives necessitate a basically inductive approach - that of data gathering, description and summary. However, a number of relevant hypothetical constructs did exist and were implicit in the research design of the project. The hypotheses that have been formulated and tested by this project are discussed below.

The resource management objectives also leaned towards the inductive approach. However, after some preliminary examination of the area, the following probabilities were established:

1. The riverbank edge contains substantial archaeological deposits, which are in danger of eroding away;
2. The ploughed field in the east central portion of the Turn contains undisturbed deposits below the ploughzone;
3. Archaeological resources exist all across the Turn area, either buried or on the surface. The Davies site (EcNj-6) and the Garratt site (EcNj-7) are therefore actually one continuous site.

All of the above mentioned hypotheses were substantiated and will be discussed in greater detail in subsequent chapters.

The research objective of establishing a model for prehistoric lifeways at the Turn generated a number of hypotheses. These are as follows:

1. The Garratt and Davies sites represent occupations by the same group of people;
2. These occupations were not necessarily limited to any particular time of year;
3. The groups occupying the Turn exploited the local resources fully, but were aware of non-local resources and used these if they were available and superior to local resources.

The research objective of refining the cultural chronology for the Turn area was also based on an inductive approach as the establishment of ceramic typologies does not necessarily lend itself well to the formulation of hypotheses.

The hypotheses related to the project research objectives, as listed above, are difficult to prove or disprove. The chapters to follow will produce evidence for or against some of these hypotheses, and whatever ultimate resolution can be reached must be left to future researchers.

What is offered here includes basic information on the nature of the archaeological resources at the Turn, hypothetical constructs regarding the nature of the prehistoric occupation and lifeways at the Turn, and a proposed ceramic typology for the Avonlea period.

4.2 Areal Survey and Preliminary Testing

Most of the survey of the area and some preliminary testing, were conducted during the 1984 inventory investigations. These took place over a span of one month using a crew of four field personnel. During this phase of operation, emphasis was on determining the

limits of the archaeological resources at the Turn and locating undisturbed deposits. The large area to be covered and the lack of time in which to do so caused some problems. However, a workable approach was devised using comprehensive surface survey, extensive shovel testing along the riverbank areas, and limited excavation of test units.

4.2.1 Surface Survey and Collection

Pedestrian survey is obviously not the most productive means of investigating archaeological resources on a floodplain, especially a floodplain with as rapid a rate of deposition as in the Turn area. However, the relatively recent nature of the latest occupations there, and the extensive disturbance that the area has been subject to, resulted in an increased surface exposure of the archaeological deposits. Pedestrian survey was therefore of great value in locating the limits of the archaeological resources at the Turn, and in some cases indicating the presence of undisturbed buried deposits. Finally, it was valuable in determining the nature and extent of the impact on the archaeological resources at the Turn by man-made developmental projects and erosion. Pedestrian survey was mainly focused on disturbed areas of the Turn.

Some pedestrian survey was conducted on the steep valley slopes surrounding the Turn. These were limited mostly to the north and northeast slopes. The dense tree and bush cover on the western slopes precluded pedestrian traverses, and the southwestern slope consisted of imported fill used to face the 9th Avenue highway widening project. Traverses on the north and northeast slopes were

limited, forays were conducted upslope at approximately 100 meter intervals, and the valley surface was traversed parallel to the crest. Surprisingly, this most arduous portion of the pedestrian survey produced some positive results, including the largest and most finely formed projectile point to be discovered during the two field seasons.

The ploughed field on the northeastern portion of the floodplain was subject to relatively extensive pedestrian search. This included organized survey and mapping using 10 meter intervals and traversed twice, in a north/south direction and an east/west direction. Needless to say, a number of spontaneous 'surface surveys' also evolved over the two field seasons, as the density of the artifact scatter in the field became a magnet for the field crew whenever boredom or a lull in action set in, or whenever visitors at the site necessitated instant gratification in the form of artifact discoveries. Artifact concentrations were noted, but due to artifact density and the disturbed nature of this particular area, collection was generally limited to diagnostic artifacts.

The oxbow lake/marsh occupying the inner floodplain to the northwest was extremely difficult terrain for pedestrian survey, and was largely ignored with the exception of a few unproductive forays, at intervals which probably approximated 250 meters.

The southern portion of the floodplain was covered by a secondary growth of lush grasses interspersed with some tree cover. Pedestrian survey was therefore limited to the numerous roads, dirt trails and paths which networked the area, with fairly successful

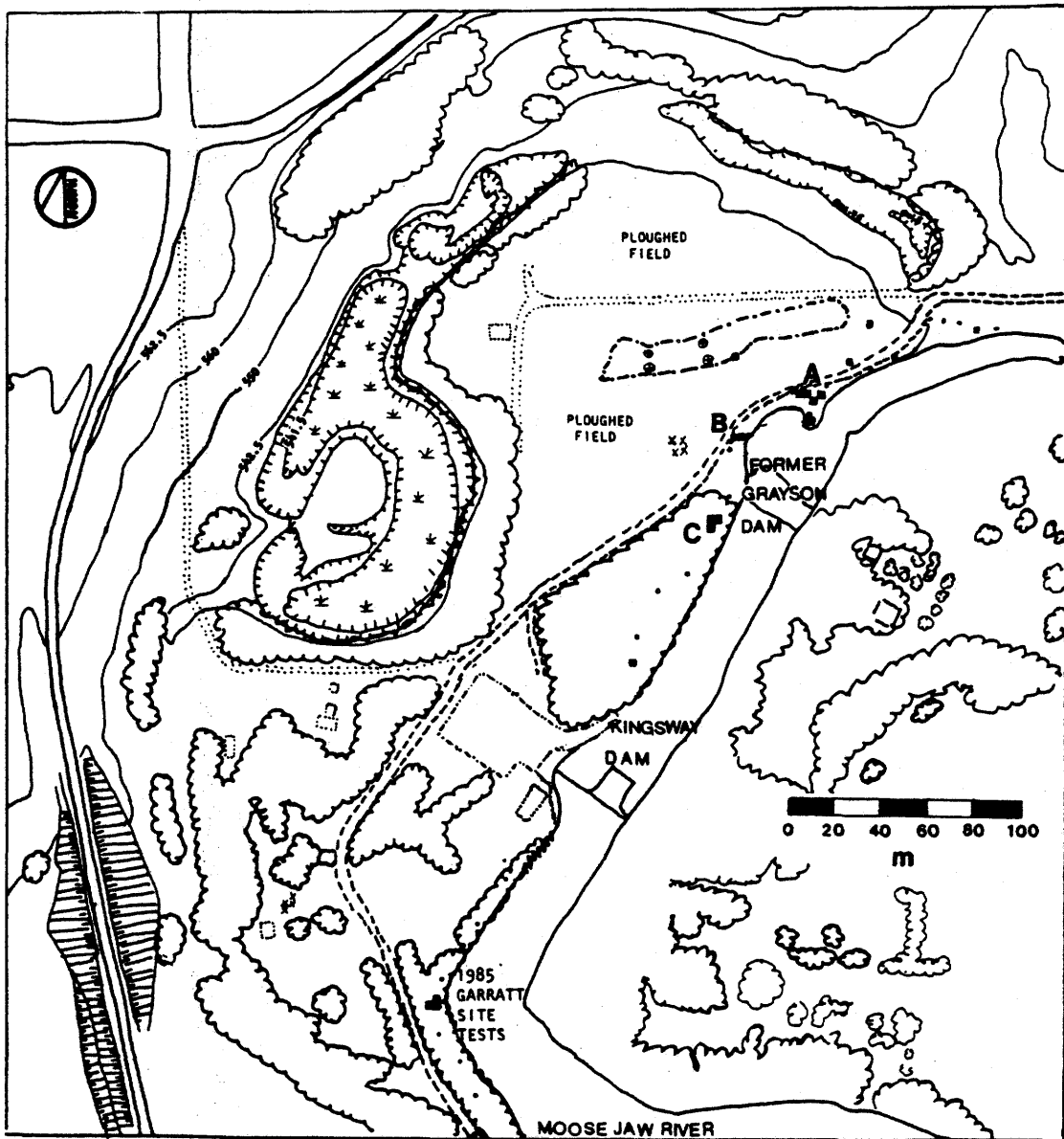
results. Artifact collection was conducted in a similar manner to that described for the ploughed field.

The riverbank area, which comprised the southeastern edge of the floodplain, had been subject to the most rapid depositional processes, and thus did not lend itself well to pedestrian surveys. However, erosional processes caused by dam backwash had produced a number of cutbanks and scarps ideal for location of buried cultural deposits. These were examined at length, to the extent that physical agility and water levels would allow. Results were encouraging- wherever a substantial cutbank exposure could be reached for examination, multiple layers of cultural occupation were evident.

4.2.2 Preliminary Testing

In order to facilitate testing and collecting provenience, a north/south grid was set up. The grid was oriented to true north, at a declension of 16 degrees and 50 minutes west of magnetic north, and a datum point was set at 8 m north of a telephone pole directly outside the gate to the Turn, in the centre of the access road. The entire floodplain was divided into a 30x30 m grid except where dense bush cover made surveying impossible, and a line was extended to the river terrace to the southwest where the Compass site is located.

Preliminary testing consisted mostly of a combination of shovel tests and larger test pits along the riverbank. Testing was done at roughly 10 meter intervals, subject to the angle of the riverbank (Figure 5). One of every four test locations was subjectively selected for a test pit, while shovel tests were located at the remaining three test locations. Areas of massive disturbance were



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














- | | | | |
|---|---------------------------------|---|---|
|  | Dirt Road |  | Tree Cover |
|  | Previous Structures & Roads |  | Test Unit, 1984/85 Excavations |
|  | Borrow Pit |  | Shovel Test, 1984 Inventory |
|  | Waste Fill Area, 0 - 0.5 m Deep |  | Exposed Cultural Layers |
|  | Depression |  | Test Units, 1983 ARMS Evaluation |
|  | Contour Lines, m.a.s.l. |  | Test Units, 1966-69 SMNH Excavations |
|  | Marsh |  | Block Designations, 1985 Excavations at the Davies Site |
|  | Artificial Incline | | |

Figure 5: Test areas at the Turn

omitted. These included the backfill area for the old Grayson Dam, and the construction and fill area of the more recent Kingsway Dam. Two test pits were excavated on the cultivated inner floodplain area at the northeast end of the Turn. The inner floodplain to the south was not tested further, since it had been extensively excavated by the Saskatchewan Museum of Natural History. The inner oxbow lake/marsh area was not tested for obvious practical reasons.

Shovel tests were approximately 50 cm in diameter, to a depth of between 45 and 50 cms. Provenience was not maintained within the shovel tests, but all soil was screened through a 1/4 inch mesh and a rough description of the soil profile was recorded. A total of 19 shovel tests was excavated along the riverbank edge of the floodplain. Results were disappointing; only one of the 19 units yielded positive results.

Subsequent excavation of the test units indicated that the buried cultural deposits were generally too deep or too scattered to be located by shovel testing.

A total of 9 preliminary 1x1 meter test pits were excavated. These units were shovel shamed in 10 cm arbitrary levels, to a depth of 1 meter. All cultural horizons were trowelled in quadrants, recording artifacts in situ where possible. Plan drawings were made of all features and cultural layers with an unusual amount of materials. Two wall profiles were recorded for all test pits which produced cultural material. All soil was screened through a 1/4 inch mesh.

The 1x1 m tests pits produced considerably more positive results

than the shovel tests. Three of the nine units contained multiple intact cultural horizons and a fourth unit revealed a deeply buried bone bed beneath the ploughed field on the inner floodplain. It was concluded that 1x1 m test pits were better suited to testing the deposits on the floodplain at the Turn, and that no further shovel testing would be attempted.

The locations of all test units are shown in Figure 4. The results from the preliminary testing and the second year expansion of the test areas are discussed in Chapters 5 and 6.

4.3 Expansion of Test Areas

The second season (1985) of investigations at the Turn involved a five person crew over a period of three months. Seventeen 1x1 m units were excavated at the Turn. The floodplain units were judgementally placed adjacent to the units which had revealed buried cultural horizons during the 1984 season testing, or above cultural horizons exposed in the cutbank. This resulted in four main excavation 'blocks', with three to eight units in each. An additional four units were placed in other areas to fill out the sample.

The units were excavated to a minimum depth of 1 m. If cultural material had been encountered in the last 20 cm, the units were taken down an additional 10 cm, or further until no more cultural material was encountered. Finally, a 50x50 cm shovel test was excavated to the depth of approximately 40 cm in one of the larger test units for each of the excavation areas. In one case a further cultural horizon

was encountered, and the unit was excavated to a depth of 150 cm. Although the exposed riverbank profiles and the results of the SMNH project indicated a possibility of more deeply buried deposits, time constraints, safety precautions and the nature of the unit layouts precluded deeper excavations during this project.

For selected units from each of the four main floodplain excavation areas, all soil from the cultural horizons was saved after initial screening, and was later fine screened using the flotation method.

Carbon samples were collected for each cultural horizon wherever adequate organic material was available. Ten samples were submitted for dating.

4.4 Catalogue and Analysis Techniques

All lithic and ceramic artifacts were washed, as were all plastic, glass and earthenware historic materials. Non-fragile identifiable faunal material, as well as those larger than 5 cm were washed; the remainder were cleaned with a dry brush.

All material was catalogued according to quadrant, level and unit. Within each quadrant, all lithic tools and in situ ceramics were catalogued separately. Ceramics from the screen were grouped together according to surface finish and body portion. Lithic debitage was catalogued together according to raw material type. Faunal material was catalogued separately wherever the species and/or element was identifiable. Where specific element was not identifiable, bone fragments were sorted to large, medium or large,

medium, and small mammal. Fragments were further sorted into size grades. As far as possible, bone fragments were also separated according to bone type, such as long bone shaft fragments, long bone epiphysis fragments, cranial fragments, etc.

Lithics were not subjected to microscopic or use-wear analysis. Tools were identified according to type. Raw material percentages were calculated according to tool and/or debitage type.

Whenever possible, ceramics were refitted and typed according to surface finish, decorative motif and vessel form. Ceramic sherds were also analyzed for colour, hardness and temper.

A species list was formed for the faunal remains, and minimum number of individuals (MNI) were calculated. Both identifiable elements and typed bone fragments were tabulated according to Binford's utility indices. Analysis results are presented in Chapter 6.

5.0 STRATIGRAPHY, DATING AND DISTRIBUTION OF ARCHAEOLOGICAL RESOURCES

This chapter describes the distribution of the archaeological resources at the Turn, and places them within the context of the sedimentary stratigraphy of the area. Where applicable, buried cultural horizons are discussed in terms of their content and radiocarbon dates.

5.1 Distribution of Archaeological Resources for the Turn Area

With the probable exception of the area of the oxbow lake/marsh, cultural remains appear to be scattered all across the Turn area. The 1984 and 1985 investigations revealed that the archaeological resources are more or less continuous from the valley crest to the floodplain and across the floodplain to the river terrace to the south .

The prairie surface encircling the Turn is completely given over to residential development and ensuing disturbance. Paved roads encircle the valley crest on all sides. The pedestrian survey of the northeastern portion of the valley slope and crest revealed a sparse distribution of prehistoric artifacts; three flakes were discovered along the valley crest, and a Plains Side-notched point was recovered in an erosional gully half way down the valley slope.

A concentration of historic and prehistoric artifacts was encountered in the ploughed field in the northeastern inner floodplain. Historic material was particularly dense in the area

closest to the oxbow lake/marsh, where a 1978 airphoto and a still extant shelterbelt indicate a recent historic residence. The remainder of the ploughed field was equally distributed with historic and prehistoric materials. The historic material is outside the scope of this thesis, and will be reported upon elsewhere. Artifact density for the cultivated field is estimated at one artifact per five square meters.

Numerous artifacts, especially bone fragments, were evident in the dirt roads, trails, and footpaths which network across the floodplain, and indicate that the more shallow archaeological deposits are continuous along the outer floodplain (adjacent to the riverbank) from the northeastern tip to the southern tip, and then up slope to the river terrace where the Compass site is located. The surface scatter is slightly more concentrated in the northern portion, at approximately one artifact per five square meters. Artifact density towards the southern floodplain thinned to an estimated one per 10 square meters. Density increased considerably on the river terrace to a peak of one artifact per square meter at the Compass site. A Plains Side-notched point, two bifaces, and a bipolar core were recovered from the road at the northern end of the floodplain. Surface artifacts were not collected from the southern end of the floodplain. A large quantity of surface material was collected from the roads and trails across the river terrace as described in Section 5.2.3.

Cutbank profiles were evident at three areas along the floodplain edge at the Turn, and in two locations upstream at the Kenney site.

All of these indicated multiple buried cultural horizons. In fact, wherever a reasonable amount of cutbank exposure could be found, buried cultural horizons were present.

Subsurface testing showed a lower success rate in locating archaeological deposits. Of the nine initial test pits excavated in 1984, only four produced buried cultural horizons. Eleven of the 1985 test units were located on or beside known cultural deposits; the three remaining 1985 test pits were all located in areas of high disturbance. One of these was located in the historic refuse concentration in the ploughed field and two in the fill area adjacent to the Kingsway Dam. These units were placed in an attempt to determine the depth of disturbances, and whether intact cultural horizons lay beneath the disturbance. In all three cases, the depth of disturbance was below the capacity of the test units, and cultural material was not recovered, with the exception of post World War II 'refuse' from the unit in the ploughed field.

It is postulated that the negative results in the five test units in undisturbed areas are either due to the cultural horizon having thinned out or being more deeply buried there. An alternate hypothesis would be that the buried deposits are not as extensive as the surface deposits since all five unproductive units are within the limits of the surface scatter. However, the average density of surface artifacts across the floodplain is one artifact per 7.5 square meters with obviously varying concentrations. This coupled with the fact that artifacts were not recovered from the surface level of those five units would support the theory that the negative

results are a function of the sample. It should also be noted that, of the four initial test units which located buried cultural deposits, two of those were sterile to a depth of 90 cm.

It can therefore be concluded that both surface and buried deposits at the Turn are more or less continuous across the floodplain. In the case of surface deposits, distribution continues across the neighboring river terrace to the south.

5.2 Sedimentary Stratigraphy

As mentioned in the introduction, the majority of the study area is located on a floodplain of the Moose Jaw River. Frequent flooding has resulted in an alluvial deposited stratigraphic profile characterized by numerous, poorly developed 'A' horizons (paleosols), interspersed with thick 'C' horizons of interbedded silt, sand and clay. Figure 6 shows a portion of the largest exposed stretch of stratigraphic profile encountered during the 1984/1985 investigations. Seventeen 'A' horizons or paleosols were counted there, the lowest at a depth of 122 cm below the surface.

Within the general sedimentary structure, there is a considerable amount of variation across the floodplain. Depth of burial was particularly variable in certain areas. Prehistoric deposits would generally be encountered within the first 30 cm in most areas of the floodplain. However, in Area C at the Davies site, an area where the surface slopes gently down to the river bed, historic deposits extend to a depth of at least 70 cm below an already depressed surface level, and prehistoric deposits were not

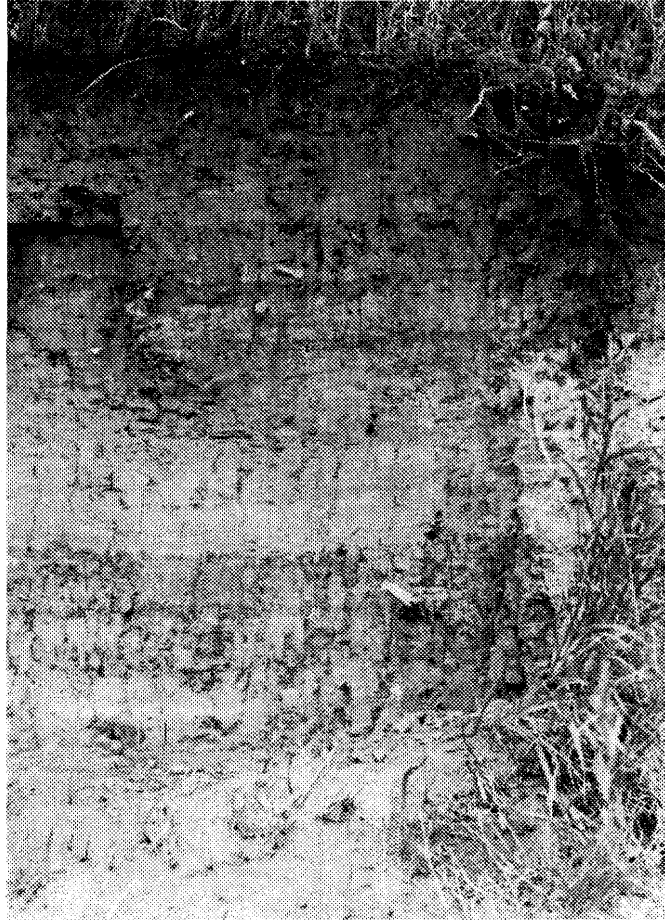


Figure 6: Garratt site cutbank exposure

encountered until 90 cms below surface. The nature of the stratigraphy of Area C warrants further attention - it is located in an area where a seasonal drainage channel once entered the river, and thus is at a lower elevation than the surrounding floodplain. It is also located in an area that was directly behind the old Grayson Dam and was thus probably under water for extended periods from 1912, when the dam was constructed (Reid et al. 1979: 13) to its removal in 1983. A new dam, the Kingsway Dam, is now located to the southwest and upstream from the original dam, resulting in the exposure of Area C. The stratigraphic profile in this area, based on a group of three 1x1 meter test pits, is characterized by a higher frequency of clay deposits and fewer sandy deposits than elsewhere on the floodplain. In addition, the lower horizons show a high degree of gleying (mottling with spots and streaks of grey and rust). This is caused by permanent or periodic intense reduction which occurs in poorly drained to undrained flat-depressional areas (Moss 1978: 6). The bone recovered from these lower horizons was frequently stained a rust colour and had a somewhat mineralized appearance, which would also be consistent with long periods of submersion or poor drainage. Finally, the profile wall of the unit closest to the river, 101s 170w, showed an interesting type of bioturbation - one paleosol had a peculiar undulating profile, being alternately compressed into and elevated above the layers below. Initially, it was hypothesized that this 'pot-holed' area was a result of bison or horse trampling in a muddy watering area. However, an alternate theory was suggested by Allyson Ramsay

(Personal Communication, 1988), after encountering the same phenomena at the Melhagen site in central Saskatchewan - that of 'load-casting' (Reineck and Singh 1980: 85). Load-casting occurs as a result of alternate periods of immersion and exposure; when a wet substratum is rapidly covered by dry sediments, the centre of gravity in the substratum is changed, and some areas are pulled down while others are pushed up, creating 'flames' or loops of elevated and depressed areas of the substratum. It is quite possible that a layer of dry sediments was suddenly deposited on the waterlogged area during construction of the Grayson Dam, or by some other unknown natural or man-made forces. Regardless of whether these contortions were caused by animals trampling in the mud or by load-casting, it is consistent with the notion that this area was originally close to or below the water level, and that the upper 90 cm of deposit were rapidly accumulated subsequent to the installation of the Grayson dam.

Across the rest of the floodplain, the stratigraphy can be characterized by a consistency of general depositional processes, but an extreme amount of variability in the continuity of particular paleosols exists. Both splitting and merging of paleosols was frequently encountered in profiles - a paleosol may split or merge several times within a space of two or three meters. In practical terms, although all the profiles appear generally similar across the floodplain, continuity of any particular paleosol between two unexcavated areas cannot be assumed on the basis of depth or similarity of soil characteristics. This is particularly important in the light of the fact that the claim that Besant period ceramics

were encountered during the SMNH excavations (Watson 1969: 10; Morgan 1978: 219) was based on an assumption of stratigraphic continuity across an area of at least 250 meters! This problem will be discussed further in Chapter 7.

One final point should be mentioned in relation to the stratigraphic processes at the Turn. The relatively low organic content in the poorly developed floodplain paleosols, coupled with frequent and rapid floodplain depositional processes resulted in an extremely good preservational environment for cultural deposits. Cultural horizons and the artifacts they contained were quickly covered by a protective layer of benign sediments. Once buried, breakage, decomposition and other post-depositional processes were slowed down to a minimum. It can therefore be postulated that taphonomic processes (post-depositional disintegration) played only a minor role at the Turn.

5.3 Cultural Stratigraphy and Dating

This section provides information on the cultural deposits at the Turn, including placement, a general description of content, and where applicable, postulated dates from radiocarbon samples, diagnostics or other information. It provides the general context for the artifacts described in the next two chapters.

Due to practical reasons discussed in the introduction, the 1984/1985 archaeological investigations at the Turn involved a limited amount of testing in a number of areas across the floodplain and adjacent river terrace. The location of these areas was shown in

Figure 5 (page 47). On the northeastern floodplain, two test areas were located along the riverbank, a single unit was excavated in the centre of the ploughed field, one unit was excavated on the west end of the ploughed field, and one test area was located between the disturbed areas of the old Grayson Dam and the new Kingsway Dam. On the southwestern floodplain, one stretch of exposed cutbank directly south of Kingsway Dam was profiled but not excavated, and a test area was excavated close to the riverbank on the southern end of the floodplain.

5.3.1 The Cultural Components of the Davies Site (EcNj-6)

Area A, the largest block of test units (seven) was excavated at the Davies site, on a portion of the riverbank that had been badly eroded by backwash from the old Grayson Dam, leaving an indented upper cutbank and a step-like lower remnant portion of the eroded area (see Figures 7, 8 & 9). Four test units, 39s116w, 39s118w, 39s119w and 40s117w were excavated in 1985 along the eroded upper edge and adjacent to the 1984 test unit 38s120w. Three cultural horizons were uncovered in these test units (Figure 10). The upper horizon, approximately 40 cm below the surface, contained a large number of pot sherds from a single cord-wrapped-paddle marked vessel, lithic debitage, charred chokecherry seeds, and small bone fragments. This horizon has produced a C-14 date (S-2781) of less than 100 years. The second cultural horizon, 60 cm below surface (B.S.), contained lithic debitage, fire-cracked rock and a large amount of charcoal. Bone fragments were also recovered, including a human distal pedal phalanx, left third metatarsal and several human ribs

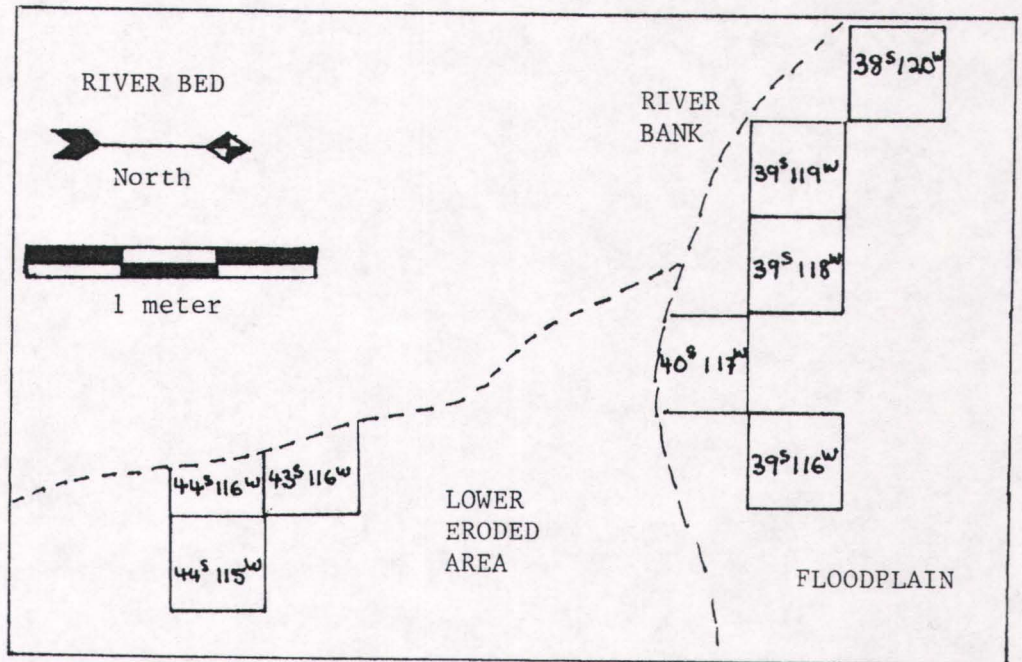


Figure 7: Davies site area A test units



Figure 8: Davies site area A, upper portion. This person is standing in Unit 39s 116w. 40s 117w is to the right, and Units 39s 118w and 39s 119w are in the upper right. The unit in the far upper right corner is 38s 120w, which was excavated in 1984.



Figure 9: Davies Site Lower Area A, Unit 43s 116w is located on the excavated shelf on the slump block slightly left of center, Unit 44s 116w and 44s 115w are to the left, partially obscured by a bush. Unit 40s 117w cuts into the riverbank surface in the upper center of the photo. Units 39s 116w, 39s 118w and 39s 119w are not visible; 39s 116w is to the right of 40s 117w and 39s 118w and 39s 119w are to the left.



Figure 10: Stratigraphic profile for Area A, upper portion



Figure 11: Upper Area A, third cultural layer, floorplan

(no intrusive pit feature was identified), as well as elements from a large dog/wolf (numerous other immature Canis lupus elements were screened from the slumpage below this unit). This level was C-14 dated to 335+/-175 B.P. (S-2782). The third cultural horizon, 70 cm B.S., contained large bison elements, including a skull and parts of the lower limb (see Figure 9). Lithic debitage and a small charcoal stain were also present. This occupation was C-14 dated to 375+/-185 B.P. (S-2783). A fourth cultural horizon was located in 39s116w at approximately 130 cm B.S. It contained whole and partially butchered bones from the lower portion of a bison limb, and was C-14 dated to 835+/-70 B.P. (S-2784). All four occupations can be assumed to be associated with the Plains and Prairie Side-notched complexes. Lithic diagnostics were not recovered from any of these upper units, but the radiocarbon assays place the occupations within that period, with the exception of the date from the upper cultural layer. The presence of ceramics in that layer would imply that the occupation is older than the given date of less than 100 years, and that there is some problem with the dating of that particular sample. The radiocarbon dating was done on a charcoal sample from 40s117w, and it is possible that the proximity of the sample to the exposed cutbank edge resulted in some contamination.

Three 1x1 meter test units, 43s116w, 44s116w and 44s115w were excavated on the lower, uneroded remnant portion of the site. The upper layer of this block is estimated to be approximately 50 cm lower in elevation than the lowest depth reached in the excavation of 39s116w; however, some slumpage from the upper bank to the lower,

uneroded block has occurred to complicate matters. These units revealed a sparse upper cultural level and two subsequent densely packed cultural levels (Figure 12). The upper level contained a small reworked Avonlea point, lithic debitage and some bone. The central level was a midden, 8 cm thick and at least 2 m by 1.5 m in diameter (Figure 13). It contained ash, charcoal, fire-cracked rock, butchered bone (mostly bison), lithic debitage and tools, and a potsherd. The only ceramic sherd displayed rim and decoration attributes typical of ceramics found associated with Avonlea occupations elsewhere on the plains. A C-14 dating of this level produced a date of 1280+/-110 B.P. (S-2785). The lowest cultural horizon contained a hearth at least 1.5 m in diameter, consisting of a lens of ash 8 cm thick, with butchered bison bone, net impressed pottery, lithic debitage and a triangular point felt to be diagnostic of the Avonlea culture. Charcoal samples were dated at 1540+/-210 B.P. (S-2786).

In 1985 two units, 49x138w and 49s139w, were excavated further west (Area B), adjacent to 1984 test unit 49s140w (see Figure 14). These units contained three main cultural horizons. The first was approximately 30 cm B.S., and contained a light scattering of bone fragments including bison, bird and a possible canid element. The middle cultural horizon, approximately at 40 cm B.S., contained butchered bison bone, a number of whole bison lower limb elements, numerous bird bones, and a few stone flakes. A charcoal sample from this layer gave a C-14 date of 535+/-205 B.P. (S-2787). The lower level actually consisted of several poorly separated paleosols

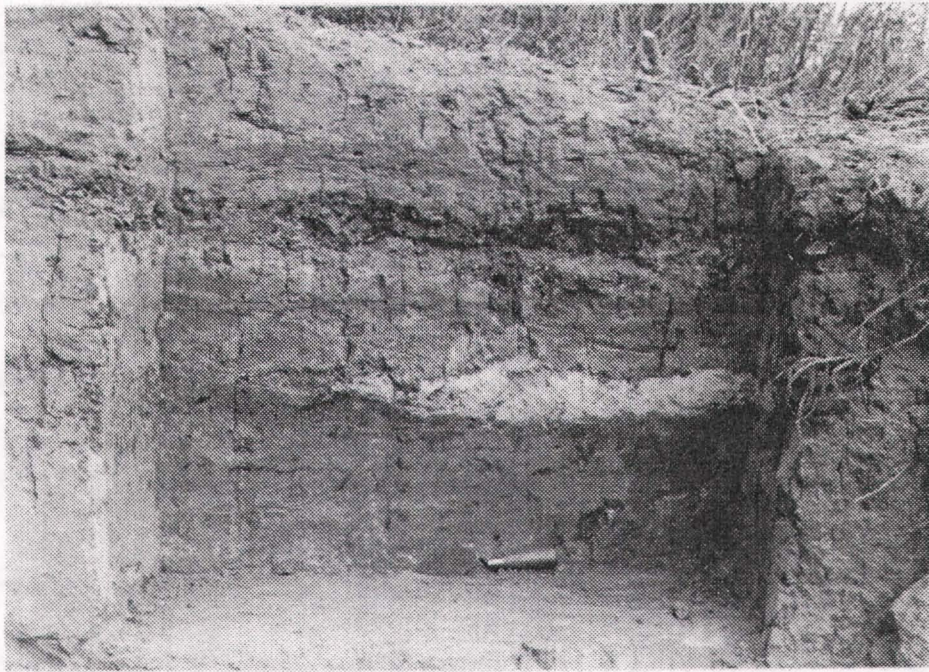


Figure 12: Profile of Area A - Avonlea levels



Figure 13: Middle Avonlea level - 'kitchen' midden

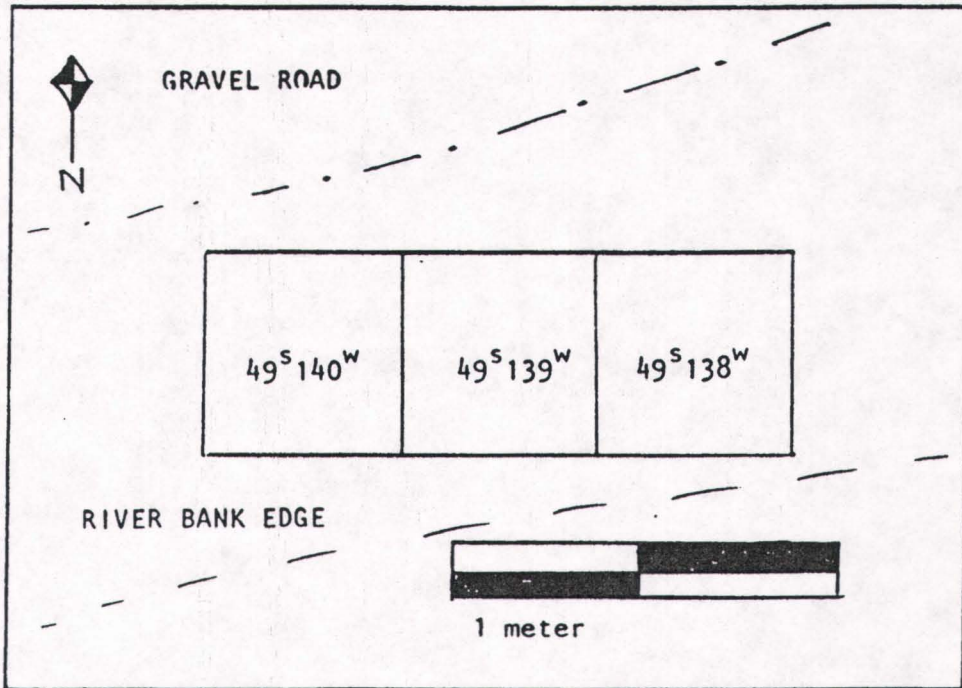


Figure 14: Area B, Davies Site

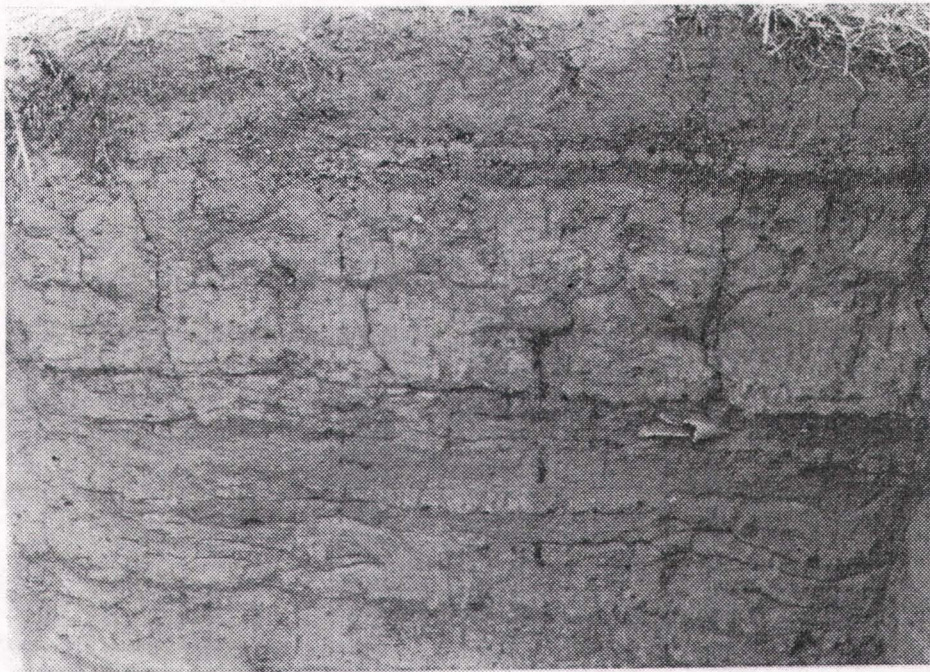


Figure 15: Profile of Area B

located between 50 cm and 60 cm B.S. This level contained bison elements from the lower limbs, bird bones and a single rabbit phalanx. All three levels contained very minor amounts of lithic debitage.

Two 1985 test units, 100s169w and 101s170w, were excavated in a lower riverbank area (Area C), adjacent to the mouth of an extinct stream channel (Figure 16). These units were also located adjacent to a 1984 test unit, 100s170w. The cultural stratigraphy of these units is very complex. The cultural horizons are very close together, and have been further compressed and distorted into the hummocky soil contortions discussed in the previous section. The units contained two very productive cultural horizons (Figure 17). The upper one was located approximately 95 cm below the surface. This layer contained elements from a small fox, some bird bone, and a large quantity of butchered bone fragments, including a crushed bison skull. Also present were a large quantity of fire-cracked rock, scattered lenses of ash, potsherds, some lithic debitage, an end scraper, a projectile point blank and a triangular projectile point. This layer is tentatively dated to the Plains Side-notched culture; a C-14 date of 365+/-70 B.P. (S-2789) substantiates the interpretation. The lower layer contained a small hearth and butchered bone, including fetal bison elements which indicate a late spring kill, fire-cracked rock, a large amount of broken pottery, lithic debitage and a Prairie Side-notched point base. Charcoal samples from this layer produced a C-14 date of 575+/-105 B.P. (S-2788) and one younger than 100 years. The second date is assumed to have been contaminated

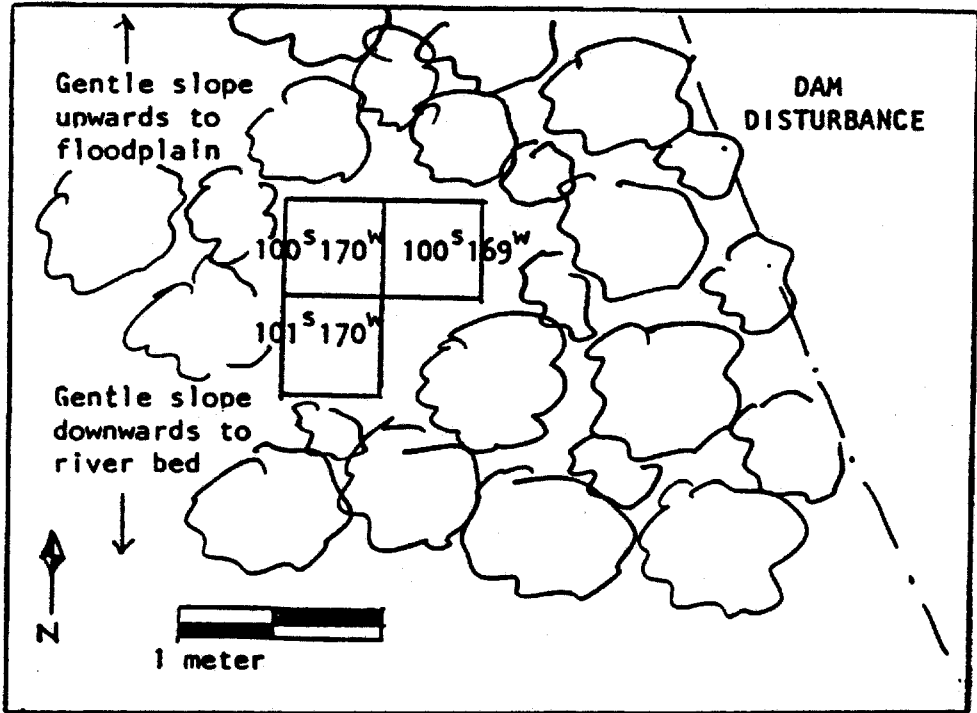


Figure 16: Davies site Area C



2

Figure 17: Profile from Area C

since it is substantially later than the date from the layer above.

Two test units (Dam tests #1 & #2) were excavated immediately north of the Kingsway Dam in an area of disturbed fill. These units were excavated from 30 to 50 cm in depth, and were terminated due to time constraints and difficulty in excavating through the cobble-laden gravelly fill. Neither unit reached any undisturbed prehistoric cultural horizon. One test pit, 2n275w, was excavated well north of the river bank, between the ploughed field and an extinct oxbow lake which is now a marsh. It was dug down to one meter without encountering prehistoric cultural horizons. The first 25 cm contained a large quantity of relatively recent (post-1960) historical debris. Examination of old airphotos led to the conclusion that the unit was located in the vicinity of a residential building which was still standing in 1978.

One test unit, 20s140w was excavated in the center of the ploughed field. A large amount of heavy debris (rocks, gravel and asphalt) was encountered in the first 60 cm below the surface, and subsequent examination of old airphotos revealed that the unit was located on or near what was once a road giving access to the residence which used to be located on the eastern end of the ploughed field, where the test pit described in the previous paragraph was excavated. However, an intact A horizon was discovered at 90 cm B.S., containing 3 badly crushed long bones, a complete unciform, and numerous other bone fragments, some of which belong to rodents (Figure 18). It was possible to identify the long bones as the left forequarters of a bison. No lithic or ceramic material was recovered



Figure 18: Floorplan view of bone bed in 20s140w

from this unit. No cultural affiliation can therefore be assigned to the one bone bed from this unit - in fact, the absence of cultural material makes it impossible to prove that the bones were not deposited naturally. The fracturing probably resulted from pressure from the road above the unit, but given the presence and nature of the archaeological deposits across the outer edge of the floodplain, there is a distinct possibility that a substantial intact cultural horizon exists well below the ploughzone on the inner floodplain.

5.3.2 The Cultural Components of the Garratt Site

A cutbank exposure (Area D) was profiled for 2.5 m and to a depth of 2 m, with one test exposure extending down to 2.5 m below the river bank surface. The cultural materials exposed revealed a minimum of six, and possibly eight, occupation levels. These can be grouped roughly into two. The upper three to five occupation levels ranged from depths of 20 to 65 cm below the surface, and contained a number of stone flakes, fire-cracked rock, a small amount of bone, and a small hearth containing ash and small fragments of bone and fire-cracked rock. The lower three cultural horizons are separated from the first set by a large block of flood-deposited silty sediments, and range from 135 to 160 cm below the surface. These horizons contained little lithic material, but a substantial amount of bone, including some larger fragments and whole elements, and scattered ash lenses. No diagnostics were obtained from any of the cultural horizons in Area D. This profile, like those at the Davies site portion of the floodplain, displays a cultural stratigraphy considerably more complex than that represented by the original

Garratt site excavations by the Saskatchewan Museum of Natural History. It is possible that the difficulty of identifying such closely spaced, multiple occupations when excavating horizontally could have resulted in some lumping together in the original excavations. However, it is also likely that the site stratigraphy gets progressively more complex away from the flood fringe areas adjacent to the valley walls where the Saskatchewan Museum of Natural History excavations took place, and towards the designated floodway area adjacent to the river bank.

Finally, three 1x1 meter test units, 310s295w, 311s295w, and 311s296w were excavated at the Garratt site approximately 50 m southwest of Area D (see Figure 19). These were located in the southern-most tip of the floodplain, at a point where the topography rises gently to the south towards the river terrace on which the Compass site is located. These test units are within a few meters of the river on the east, but the banks are more gently sloped than those to the north, and no obvious cutbank exposures were found. Three cultural horizons were excavated (Figure 20). The upper horizon is located approximately 25 cm B.S., and contains butchered bone, a large amount of stone flakes, and several stone tools, as well as a considerable amount of check-stamped pottery. Diagnostics associate this layer with the Prairie Side-notched culture. This layer and the next lowest cultural occupation are both situated inside a thick A horizon, separated, in most areas, by sterile soil. The second cultural layer is located at the bottom of the A horizon, at approximately 33 cm B.S. This horizon contains a small hearth

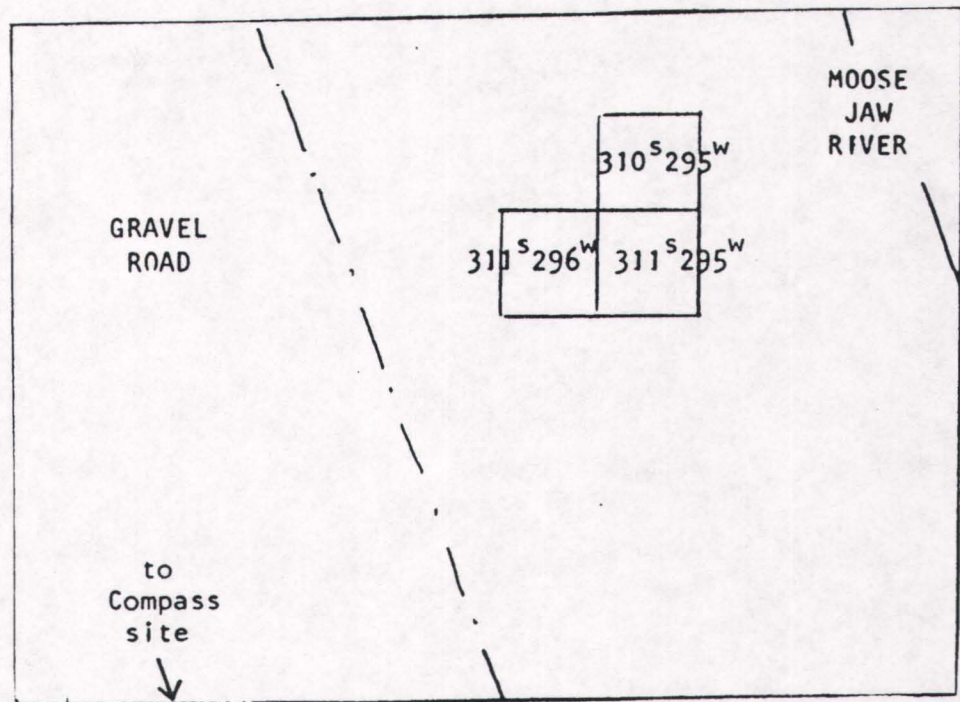


Figure 19: Garratt site test units

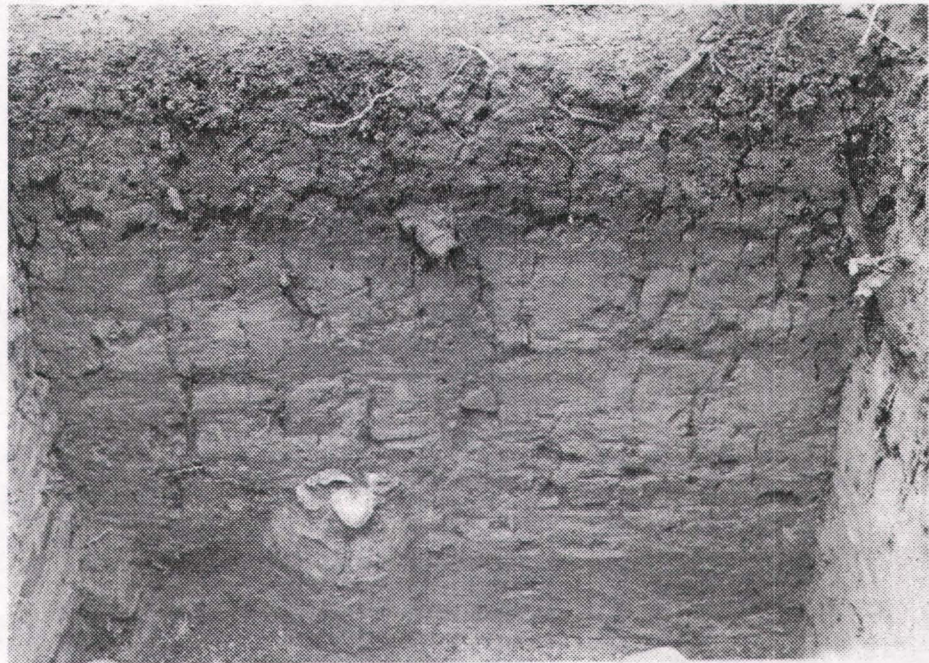


Figure 20: Garratt site profile

with associated bone fragments, stone flakes and diagnostic tools of the same culture as the upper horizon. The lowest cultural horizon is approximately 70 cm below the surface, and contains larger bison bone elements and some stone flakes, including a crude quartzite scraping tool. No diagnostics were found for this level.

5.4 Summary

It has been shown that historic and prehistoric cultural remains are distributed all across the surface of the Turn flood plain (EcNj-6 & 7) and on the adjoining river terrace to the southwest (EcNj-11). Multiple levels of buried prehistoric occupations can be found wherever soil profiles are visible along the riverbank at the Turn and upriver at the Kenny site (EcNj-14). In addition, traces of buried occupation have been encountered wherever substantial disturbance has occurred on the inner floodplain at the Turn; the SMNH excavated an extensive set of buried occupations on the southwestern floodplain (EcNj-7) and buried bone beds were encountered by earthmovers while excavating a borrow pit in the ploughed field on the northeastern floodplain (EcNj-6).

The stratigraphy of the Turn is complex, due to the multiple flood deposits, and buried soil horizons are not consistent across the floodplain. For this reason, the cultural stratigraphy of each excavated area must be considered separately. A number of diagnostics were recovered from the various excavated areas of the Davies and Garratt sites and 10 radiocarbon dates were obtained. These are summarized in Table 1. For practical purposes, the Prairie

TABLE 1: SUMMARY OF CULTURAL DIAGNOSTICS AND C14 DATES FOR EXCAVATED AREAS AT THE TURN				
Excavation Area	Cultural Level	Diagnostics	C14 Dates	
			Lab #	Years B.P.
Area A: Upper (EcNj-6)	Upper	cord-wrapped paddle marked vessel	S-2781	<100*
	Middle	lithic debitage, bone, seeds point midsection, lithic debitage, butchered bone	S-2782	335 ±175
	Lower	lithic debitage, butchered bone	S-2783	375 ±185
	Deep	butchered bone	S-2784	835 ± 70
Area A: Lower (EcNj-6)	Upper	lithic debitage, bone	-	-
	Middle	reworked Avonlea point, lithic tools and debitage, net-impressed potsherd, butchered bone	S-2785	1280 ±110
	Lower	triangular point, lithic debitage, net-impressed potsherd, butchered bone	S-2786	1540 ±210
Area B (EcNj-6)	Upper	butchered bone	-	-
	Middle	lithic debitage, butchered bone	S-2787	535 ±205
	Lower	lithic debitage, butchered bone	-	-
Area C (EcNj-6)	Upper	triangular point, lithic tools and debitage, potsherds, butchered bone FCR	S-2789	365 + 70
	Lower	Prairie side-notched point, lithic tools and debitage, potsherds, butchered bone, FCR	S-2788 S-2790	575 ±105 <100*
Garratt Site (EcNj-7)	Upper	Prairie side-notched point, bone, lithic tools and debitage, check stamped pottery	-	-
	Middle	Prairie side-notched point, lithic tools and debitage, potsherds, butchered bone	-	-
	Lower	quartzite chopper, butchered bone	-	-
SMNH Excavations	Level 6	Avonlea	S-406	1450 ± 70
Garratt Site (EcNj-7)	Level 6	Avonlea	S-407	6100 ±100*
	Level 6	Avonlea	S-408	1280 ± 60
	Level 8	Besant	S-409	1990 ± 75
Compass Site (EcNj-11)	Single Component	triangular point, flake, points lithic debitage, potsherds, gunflint	-	-

Table 1: Summary of Cultural Diagnostics and C14 Dates for Excavated Areas at the Turn

Dates for the SMNH Excavations were obtained from Morgan 1979: 246 (the B.P. date for S-408 given in Morgan is incorrect due to a typographical error, but the B.C. calculation for that date is correct). Dates marked with an asterisk are considered unacceptable.

Side-notched and Plains Side-notched levels are dealt with together in the analysis. Avonlea occupations were only encountered in one of the excavation areas, but because of the diagnostic potential of the net-impressed ceramics, they are dealt with in some detail in the discussion to follow. Besant occupations were not encountered in the 1984/1985 investigations, but discussion will be provided on the stratigraphic nature of the Turn deposits and their bearing on the SMNH excavations and interpretation of Besant occupations.

6.0 THE CULTURAL ASSEMBLAGE AT THE DAVIES AND GARRATT SITES

The previous chapter discussed the stratigraphic and areal distribution of cultural material at the Turn area of the Moose Jaw River Valley; it provided the context. This chapter will describe, categorize and discuss the nature of that cultural material.

For the purpose of meaningful analysis, some lumping of assemblages from the various levels and excavation areas was necessary. The cultural assemblage has been divided according to two time periods: the Prairie/Plains Side-notched complex assemblage, and the Avonlea assemblage. Comparisons between levels and excavation areas is also included wherever deemed pertinent. Historic material recovered during the 1984/1985 investigations is deemed not pertinent to this thesis and will be reported upon elsewhere.

6.1 Prairie/Plains Side-notched Complex Assemblage

Artifacts were included in this assemblage on the basis of association with a cultural horizon which contained points or ceramics diagnostic of the Prairie/Plains Side-notched period, or which had been radio-carbon dated to between 1000 B.P. and 170 B.P., or on the basis of stratigraphic location above such a horizon combined with presence of lithic artifacts and absence of artifacts diagnostic of the historic period. Lithic and native ceramic surface finds have been arbitrarily assigned to this period. This

assumption is made at some risk. However, there is no known record in this area of the use of native ceramics during the historic period, and those from the surface collection represent an extremely small portion of the assemblage. The lithic surface items represent the greatest potential problem, since they contributed a significant portion of the artifacts retrieved from the Davies and Garratt sites during the 1984/85 investigations, and since there is some possibility that some use of lithic technology extended into the historic period. This will be taken into account during the analysis, and comparisons between the surface lithic assemblage and the excavated Prairie/Plains Side-notched assemblage will be presented where deemed appropriate. It is assumed that the likelihood of mixing with artifacts from earlier periods, such as Avonlea and Besant is so small as to be insignificant, because of the depth of burial at the Turn, and the fact that artifacts diagnostic of such earlier periods were notably absent from the surface collection.

6.1.1 Features

Five features were encountered during the 1984 and 1985 excavations of the Prairie/Plains Side-notched levels. Four features were from the Davies site and a single hearth was encountered at the Garratt site.

A charcoal stain was found adjacent to a set of bison lower hind limb units, in the third cultural level at Area A (see figure 11). The stain was located in unit 40s117w, about 50 cm from the eroding edge of the upper cutbank. It was irregular in shape and

covered an area of approximately 40 cm in diameter. The stain did not extend below the paleosol.

A number of features were encountered during the excavation of the Area C units. Two possibly associated ash scatters in the upper level located approximately 50 cm apart, occur in the southern portions of 100s169w and 100s170w. The western ash scatter extended into the north half of 101s170w (Figures 21 & 22) while the eastern ash scatter extended into the south wall of 100s169s (Figure 23 and 24). Both scatters were irregular in shape, extending approximately 60 cm in a east-west direction. The fully excavated western feature extended approximately 90 cm north-south. Both varied in thickness from 1 cm to 5 cm. There were no signs of charring or fire-reddening of the earth beneath the features. This, coupled with the presence of a large quantity of fire cracked rock, fragmented bone, lithic debitage, tools and a few potsherds, would indicate that these features represent ash dumps associated with a general campsite refuse dump or midden.

A fourth feature was encountered during the excavation of the lower level of Area C. This feature was located in the northwest corner of 100s169w (Figure 25). This feature was relatively self contained, round to oval in outline, measuring 64 cm east-west. The north-south dimensions could not be absolutely determined, since the feature extended into the unexcavated north wall of the test area. It extended slightly below the cultural level, and contained bone fragments, underlain by an ash lens, underlain by a charcoal stain. There was some fire reddening of the earth below the feature. This



Figure 21: Floorplan of Area C upper cultural level, unit 100s169w. Eastern ash scatter.

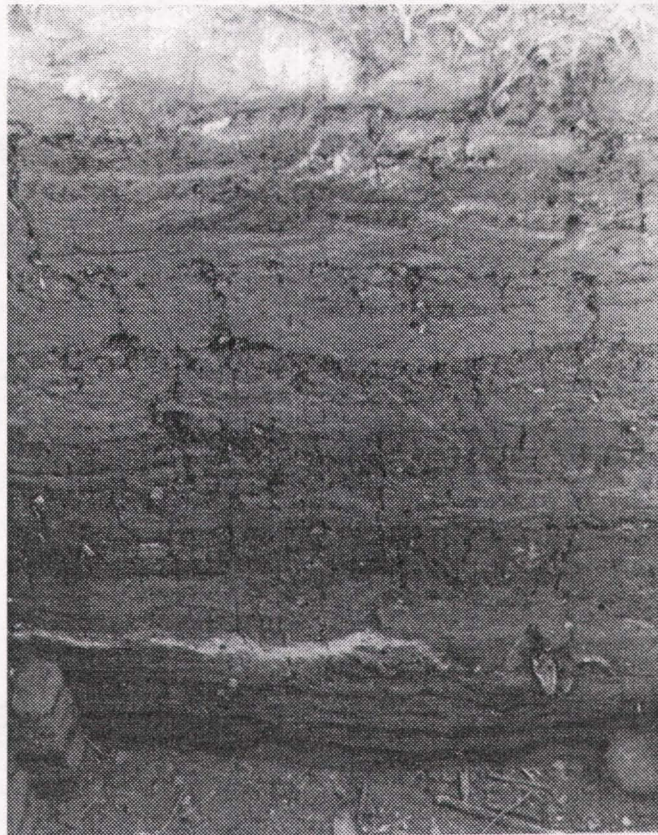
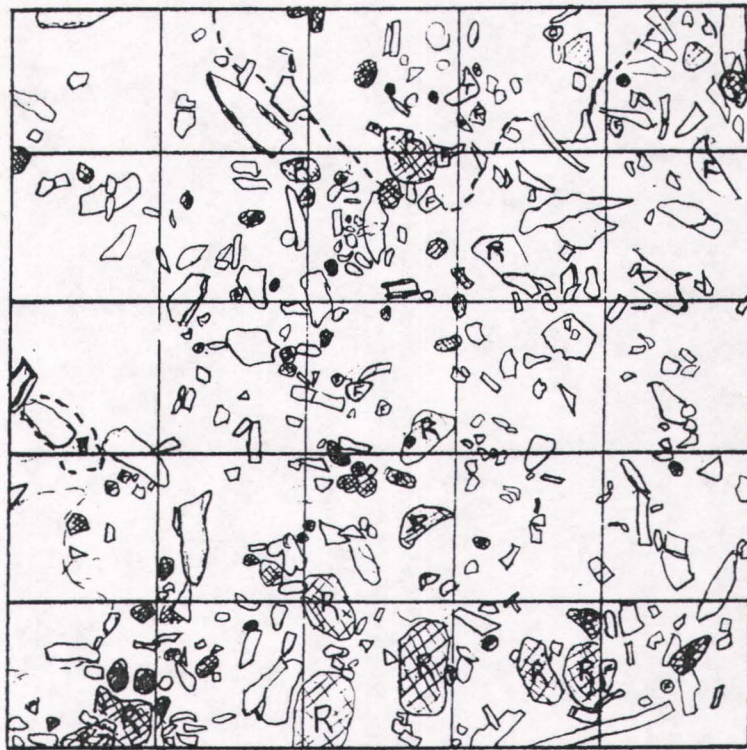


Figure 22: Eastern ash scatter in Area C upper cultural level. South wall of unit 100s169w.



Figure 23: Floorplan of Area C, upper cultural level, unit 100s170w, showing western ash scatter.



Key:
 T = tool
 F = flake
 R = rock
 C = core
 = ash

S.E.Δ

Figure 24: Floorplan drawing of Area C upper cultural level, unit 100s170w, showing western ash scatter. Area is 1 square meter.



Figure 25: Small hearth in Area C, lower cultural level. Unit 100s169w.

feature is interpreted as a small hearth, probably used for boiling meat or bone grease considering the presence of bone fragments that were apparently dumped on top of the hearth.

Finally, a single feature was encountered at the Garratt site during the 1984 shovel testing program. The 1985 Garratt site test units were excavated around this feature, but it was largely destroyed by the original shovel test (Figures 26 and 27). This feature was located in the middle cultural level, in the southwest corner of unit 310s295w, and extended into the southeast corner of unit 311s295w. It consisted of a thin, roughly circular ash lens approximately 20 cm in diameter. The ash lens was approximately 5 cm at its thickest, and was underlain by a charcoal stain. Associated artifacts included a light scatter of small bone fragments, ceramics, and a relatively high quantity of lithic debitage and stone tools. This feature is interpreted to be a small, temporary hearth.

All of the features encountered in the Prairie/Plains Side-notched levels are typical of campsite activities. In particular they all were probably associated with food preparation activities. However, none of these appear substantial enough to represent the location of a long-term dwelling hearth, such as might be found in a winter campsite. The two hearths from Area C and the Garratt site and the charcoal stain from Area A probably represent more temporary activities. However, the two ash scatters in the upper level of Area C are relatively substantial, and may represent the displaced refuse form such a long-term hearth. This interpretation is given further credence by the density and nature of associated refuse in the

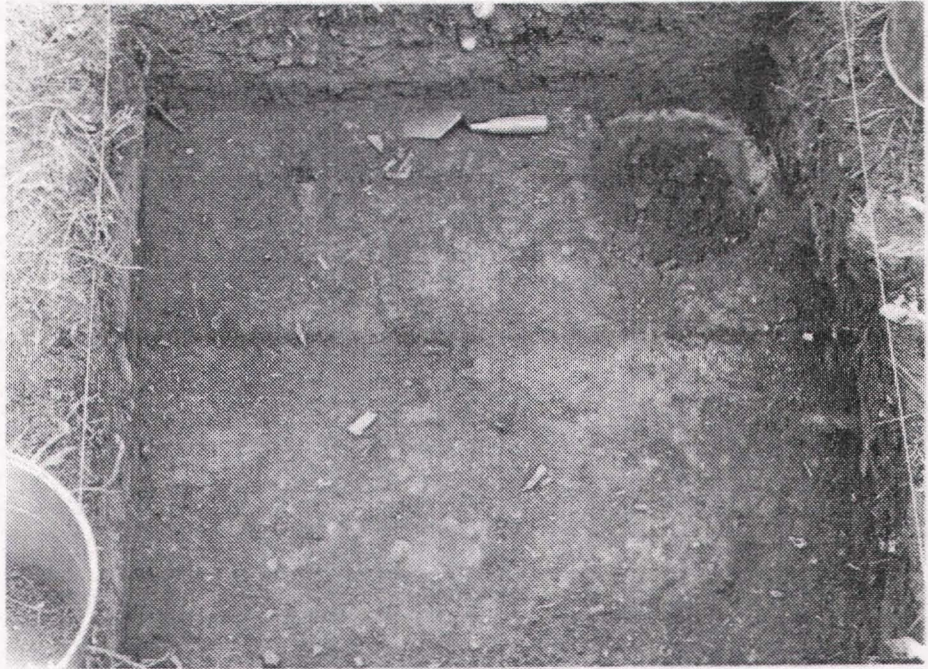


Figure 26: Garratt site shovel test revealing profile section of small hearth, unit 310s295w.



Figure 27: Garratt site hearth feature. A small portion of the hearth overlapped into 311s295w and was therefore not destroyed by the shovel test pictured above.

surrounding cultural level. The excavated areas and the features described here obviously represent a very small sample of the total campsite activities occurring on the floodplain at the Turn. The hearths which produced the ash scatters in Area C may be located outside the excavation blocks.

6.1.2 Lithics

A total of 421 lithic items associated with the Prairie/Plains Side-notched assemblage were recovered from the Davies site, and 1088 from the Garratt site. Of these 11 were projectile points, 18 were formed tools, 9 were marginally retouched tools or used flakes and 1471 were debitage.

Raw Material

A variety of lithic materials, both local and exotic in origin, were recovered from the Prairie/Plains Side-notched levels of the Davies and Garratt sites. The classification system employed here generally follows that outlined by Johnson (1986), supplemented by some references and descriptive data from Thomas (1983). A set of specimen samples from the Turn area will be curated with the artifacts from the Davies and Garratt sites to facilitate future comparison. The percentage of the various raw material types recovered is presented in bar graph form in Table 2.

It is immediately obvious that there is a considerable discrepancy between the percentage by quantity and percentage by weight of the various lithics. This can be explained as a function of the flaking quality of the lithic material. The coarser grained materials such as quartz and quartzite can generally be correlated

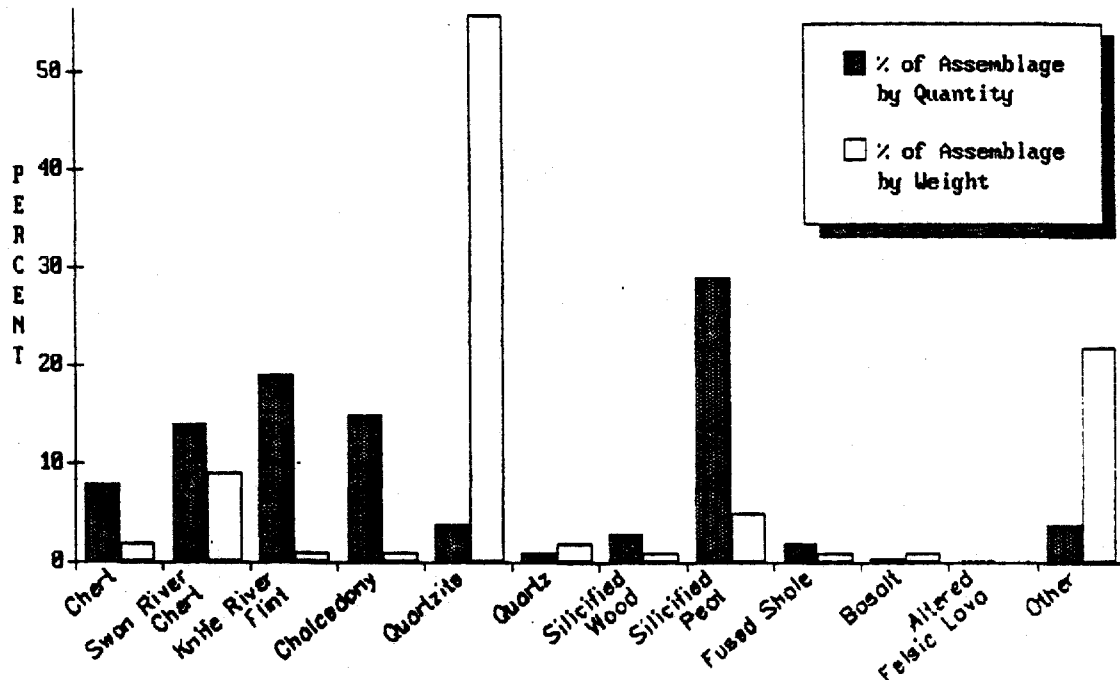


Table 2: Lithic raw material percentages for the Plains/Prairie Side-notched levels at the Davies and Garratt Sites: Shaded bars represent % of assemblage by quantity, hollow bars indicate % by weight.

TABLE 3: PERCENTAGE OF RAW MATERIAL TYPES BY ARTIFACT CLASS FOR THE PLAINS AND PRAIRIE SIDE NOTCHED LEVELS OF THE DAVIES AND GARRATT SITES													
		Chert	Swan River Chert	Knife River Flint	Chalcedony	Quartzite	Quartz	Sil. Wood	Sil. Peat	Fused Shale	Basalt	A.F.L.	Other
POINTS	% by #	-	43	18	18	-	-	-	-	18	-	-	-
	% by Wt.	-	46	10	20	-	-	-	-	24	-	-	-
BIFACES	% by #	-	22	11	-	-	-	-	44	-	-	-	-
	% by Wt.	-	1	21	-	-	-	-	1	-	-	-	-
UNIFACES	% by #	22	11	33	11	-	-	-	11	-	11	-	-
	% by Wt.	30	6	30	5	-	-	-	8	-	21	-	-
RETOUCHED FLAKES	% by #	22	22	22	-	11	-	-	22	-	-	-	-
	% by Wt.	3	12	10	-	57	-	-	19	-	-	-	-
CORES	% by #	13	26	4	4	-	-	-	9	30	-	4	9
	% by Wt.	4	5	21	1	-	-	-	<1	2	-	1	87
DEBITAGE	% by #	8	13	19	15	4	1	3	30	2	<1	<1	4
	% by Wt.	3	13	1	1	59	1	2	7	<1	1	<1	12
OTHER	% by #	-	25	25	25	-	25	-	-	-	-	-	-
	% by Wt.	-	64	1	<1	-	99	-	-	-	-	-	-

Table 3: Percentage of raw material types by artifact class for the Plains/Prairie Side-notched Level of the Davies and Garratt sites.

with the larger, cruder tools and the associated cruder flaking techniques. This would produce fewer, heavier tools as well as fewer, heavier debitage items per gram of lithic raw material. Finer-grained materials have obvious advantages in terms of flaking quality and therefore were more likely to be used for smaller, more delicately shaped tools. Because of their flaking quality such materials tended to be more highly valued. The larger waste flakes of this material were more often used for further flintknapping, producing more tools and a still larger quantity of small retouch flakes. This tendency is especially obvious in the 1984/85 materials from the Davies and Garratt sites, because the extensive fine-screening program recovered an extremely large quantity of tiny retouch flakes that might otherwise have been lost. Hence, we recovered high ratios of items (tools & debitage) per gram for the fine grained Knife River flint (8.15: 1) and other chalcedonies (7.27: 1) and correspondingly low ratios for the coarse grained quartzites (0.03: 1) and quartz (0.19: 1), with most of the other lithic types ranging in between. Basalt and altered felsic lava also had small ratios of items per gram, but the samples for these lithic materials are too small to be conclusive.

The percentage of the various lithic raw materials are outlined for each artifact class in Table 3.

Swan River chert was the most frequent material type for projectile points, with the remainder of the sample being divided between Knife River flint, chalcedony and fused shale. Bifaces were most frequently made from silicified peat; unifaces were most

frequently made from Knife River flint, second from chert, with Swan River chert, chalcedony, silicified peat and basalt being equally popular third choices. Marginally-retouched stone tools and retouched flakes were relatively equally distributed among Swan River chert, chert, Knife River flint, quartzite and silicified peat. Fused shale and Swan River chert were used for a significantly high percentage of the cores. Quartzite was by far the highest percentage by weight of material represented in the flakes and shatter category; the highest percentage by quantity was silicified peat.

More significant trends may be seen by observing the different uses of the various lithic raw material types. Knife River flint and Swan River chert appear to have been popular for almost all tool types, and silicified peat and chert were also relatively well utilized. Fused shale formed a significant percentage of the projectile points and cores, but was absent elsewhere, with the exception of a very small representation in flakes and shatter. Chalcedony was limited to points and endscrapers, quartzite to chithos and retouched flakes, and basalt to endscrapers. Quartz, silicified wood, altered felsic lava and 'other lithic materials' were not represented at all among the tools, although all were included amongst the flakes and shatter, and one core was of altered felsic lava and one of dolomite ('other lithic materials').

Consideration of the above noted patterns in lithic raw material utilization should be done with caution; a number of statistical problems are inherent. First of all, the lithic assemblage is not large enough to be statistically conclusive, especially when

considering the distribution of the raw materials within the various tool and debitage categories. Secondly, fine screening was limited to certain excavation units, and was not consistently used in all excavation areas. Unless the various lithic raw materials used were distributed in equal proportions across the entire Turn area, greater use of fine-screening in certain excavation areas would tend to weight the assemblage percentage in favour of the lithic materials most common to the fine-screened areas. Finally, it should be noted that the identification of fine-screened lithic material types is more difficult and consequently somewhat less accurate, due to the minute size of the fine-screen assemblage. The discussion of the lithic raw material distribution presented here is suggestive rather than conclusive. The implications of this study and suggestions for further research will be presented in Section 6.2.6.

Projectile Points

This category includes those artifacts which can be assumed to have been projectiles, presumably intended for mounting on an arrow shaft. These artifacts are a specialized type of biface, identified on the basis of resemblance to a norm set out in established typologies such as that in Kehoe's Gull Lake Site (1973).

Four points and one point base were classified as Prairie Side-notched points. Two of these were excavated from Area C at the Davies site. The first of these, a cream colored Swan River chert point with the tip missing (Figure 28c), was associated with a hearth in the upper cultural layer. This point fits Kehoe's general description for Prairie Side-notched points (1973: 56-57) although it

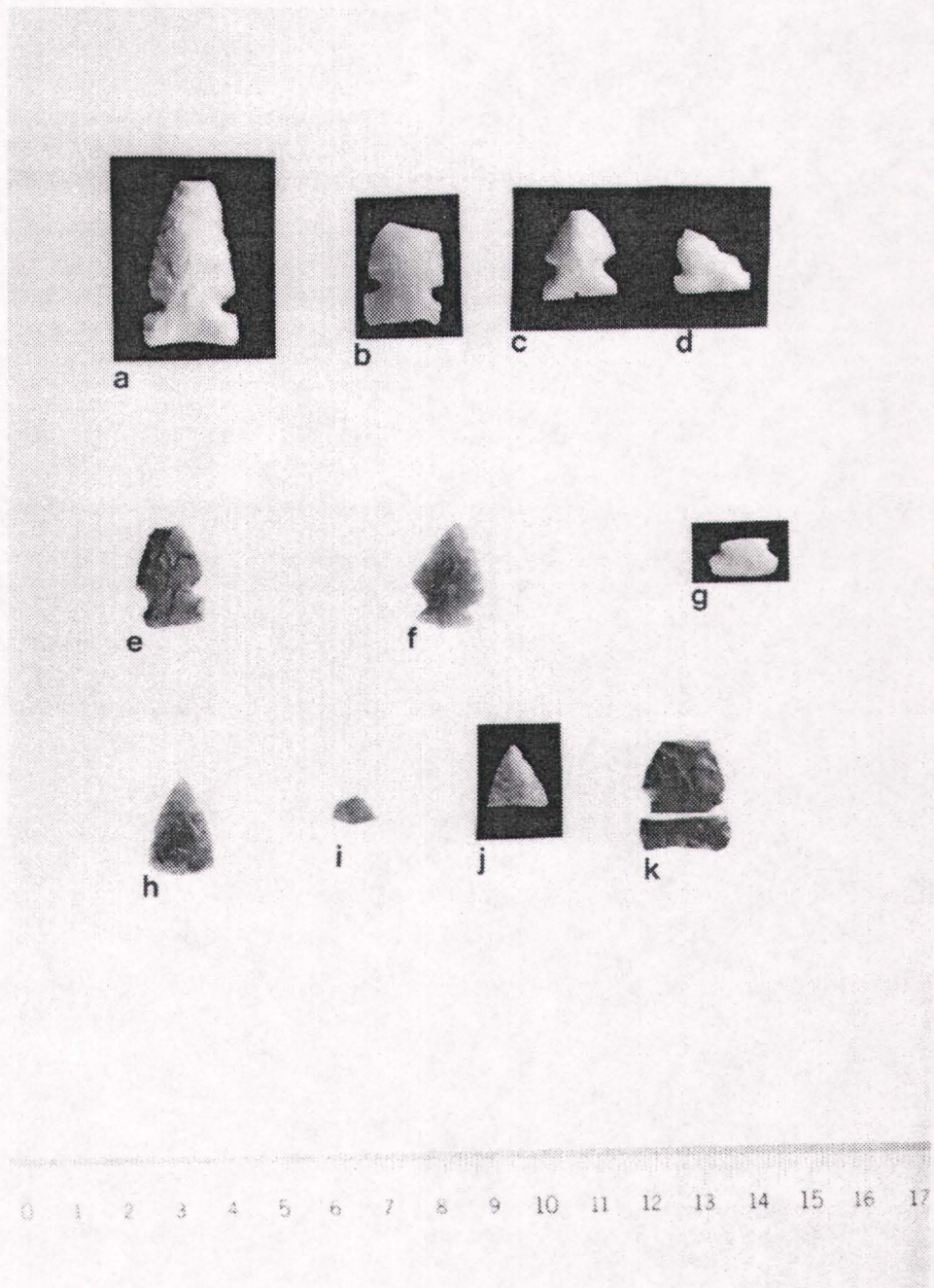


Figure 28: Davies and Garratt site Projectile points, Prairie/Plains Side-notched levels:
 a & b: Plains Side-notched,
 c - g: Prairie Side-notched,
 h: Plains triangular(?),
 i & j: unidentified point fragments,
 k: Point preform.

does not resemble any of his varieties. The point is slightly asymmetrical and has a relatively short shoulder to tip length, as compared to a long base. The point may have been reworked. Flaking appears to be fairly regular, but is hard to distinguish since the point is made from Swan River chert. The base is very flat for a Prairie Side-notched point and appears to have been ground. The second point (Figure 28d) is from the lower cultural layer at Area C, and is represented by a fragment consisting of the base and a portion of one shoulder, also of cream colored Swan River chert. Flaking is shallow and wide, and fairly crude. This point appears, by general characteristics and flaking standards, to be of the Prairie Side-notched variety. However, the notches are quite shallow, even for that type, and there is some possibility that this point represents an Avonlea or transitional point. The radiocarbon dates from the level in which it was found would indicate that such an association is unlikely, but there are some acknowledged problems with the radiocarbon dates from this unit (see Chapter 5, p. 65). Two Prairie Side-notched points were recovered from the Garratt site units, both from the second cultural layer. The first of these is of grey fused shale (Figure 28e). Although this point has a very flat base, the base is narrower than the shoulders, and the notches are wider than they are deep. In addition, an asymmetrical shape and irregular flaking pattern would indicate a Prairie Side-notched affiliation for this point. The tip is also missing from the point. The second point from this unit (Figure 28f) is of Knife River flint and resembles Kehoe's High River Small Corner notched variety (1973: 58).

The base is slightly convex and narrower than the proximal end of the blade. The notches are broader than they are deep, and appear to be ground. The shoulders are quite angular, but the angles are obtuse. The flaking is shallow, irregular, and rather poorly executed, a large number of hinge fractures are apparent, and the point is relatively thick in cross section towards the centre. One Swan River chert point base (Figure 28g) was recovered from the upper cultural layer in unit 101s170w. This also appears to be a portion of a Prairie Side-notched point, although that identification can only be tentative considering the portion of the point represented. The base is slightly concave, well ground, and relatively rounded on the sides. The notches are also ground and appear fairly shallow, although this is difficult to discern. The flaking along the base is fairly regular, but the point is irregular in cross section.

Two projectile points were identified as Plains Side-notched points. A white chalcedony point found on the dirt track between the river and the ploughed field (Figure 28b) conforms generally to Kehoe's description of that type (1973: 60-61). The base is wide and well squared on the left side. The point is somewhat asymmetrical, the notch is lower and more shallow on the right hand side. The base appears to have a slight tang on the right corner. This is probably the result of an overly deep flake along the base rather than a planned feature. The flaking is broad and shallow and fairly regular across the point. The tip is missing from this point. A second, very fine specimen of white Swan River chert (Figure 28a) was recovered from the surface of an eroding channel in the northeastern

valley wall, approximately a quarter of the way up the slope between the toe and the crest. This point also conforms well to Kehoe's type description; the outline is well defined, with sharp angles at the bases and notches. The point is bifacial and the flake scars are broad and shallow. The notches are relatively deep and well executed and both notches and base are well ground. The base is slightly wider than the blade and slightly concave, giving basal angles of slightly less than 90 degrees. This point is also missing the tip, but it is still quite long, and was probably lost before it had exhausted its potential for reshaping and reuse. Small portions of the tips of the shoulder have also been broken off. The general shape is triangular, and considerably longer than it is wide.

One triangular point of grey chalcedony was recovered from the upper cultural layer of Area C (Figure 28h). This point is roughly triangular in outline, with convex sides and base - an outline Reeves refers to as "convex lateral edge - convex base" (1983: 325). The point has a delicate appearance, although the flaking is generally irregular. Triangular points are not uncommon finds in association with Prairie and Plains Side-notched assemblages, and are occasionally classified as Plains Triangular (Morgan 1979: 267, Wettlaufer and Mayer-Oakes 1960: 31). However, this classification type seldom appears in most syntheses of the Late Prehistoric period (Dyck 1983, Kehoe 1973, Reeves 1983, Vickers 1986), possibly because they are often classified as knives (Kehoe 1973) or considered to be preforms or point blanks (Brink et al. 1985: 156, Quigg 1986a: 115, 1986b: 176). Adams (1977: 47) recognizes their occurrence in Late

Prehistoric sites and is of the opinion that they are "often glossed over due to their lack of diagnostic characteristics". The triangular point from Area C is quite similar to one recovered from the Prairie/Plains Side-notched level at the Garratt site (Morgan 1979: Plate 3a).

Two unidentifiable tip fragments were recovered during the 1984/85 investigations, both from the Davies site (Figure 28 i & j). A Knife River flint point fragment was recovered from the fine-screening from the second cultural horizon of upper Area A. This fragment consisted of the upper end of the point blade, but was missing the actual tip. Flaking is limited to the margins on this section of the point, but is bifacial and relatively regular, producing neat, shallow flake scars. It appears to have been a flake point as substantial unworked portions of the original flake blank are evident. Kehoe notes that unworked portions of the original blank are frequently found with both Prairie and Plains Side-notched points (1973: 56, 60). A more substantial point tip fragment of pink Swan River chert was excavated from the upper cultural level of Area C. This point fragment has a somewhat delicate appearance, although it is slightly asymmetrical. Flake scars are difficult to distinguish, and a substantial portion of the original blank may have been unworked on one side. Those scars that can be distinguished are quite small and shallow, and do not appear to extend far across the blade; some hinge fracturing is evident. This point is not inconsistent with the attributes generally assigned to points of the Prairie and Plains Side-notched period, but a

positive identification is impossible with the basal fragment missing.

Finally, a rather interesting point preform was recovered from the upper cultural layer at the Garratt site (Figure 28k). The specimen, of grey fused shale, consists of a basal fragment and a central blade fragment which fit together - it appears to have snapped across the neck during the notching process; the tip is also missing. The general outline appears to be broad and triangular, with a slightly concave base. The flake scars are very broad and shallow, and large portions of the original flake blank are unretouched towards the central and basal portion of the specimen. The flintknapper appears to have used a relatively thin flake, shaped out the general outline, worked the tip, and done some preliminary thinning of the base. The notching process seems to have commenced with some preliminary thinning and indentations of the neck portion on either side. One side is only slightly indented and probably not finished although the preform obviously snapped during the execution of a much deeper notch on the opposite side. Neither the base nor the notches are ground, and all worked edges are quite sharp. The notches are quite high on the blade and the base is wider than the proximal end of the blade, giving the base a squared off, Plains Side-notched appearance.

Projectile point data for this assemblage is presented in Table 4.

Bifaces

Nine bifacially worked tools and tool fragments were recovered

Type	Raw Material	Length	Shoulder Width	Max. Thick.	Basal Width/Height	Basal Grinding	Notch Width/Depth	Notch Grinding	Weight (grams)	Provenience	Cat. #
Plains SN	chalc.	$\frac{?}{1.8+}$	1.38	.38	$\frac{1.43}{.48}$	some	$\frac{.24}{.22}$	some	1.2	Davies: surface	1
Plains SN	SRC	$\frac{?}{3.10+}$	$\frac{?}{1.65+}$.43	$\frac{1.80}{.64}$	much	$\frac{.31}{.34}$	yes	2.3	Davies: surface	4702
Prairie SN	SRC	1.58	1.28	.30	$\frac{1.36}{.49}$	yes	$\frac{.49}{.22}$	some	.7	Area C: Upper c.l.	301
Prairie SN	SRC	$\frac{?}{1.16+}$	$\frac{?}{1.14+}$.32	$\frac{1.49}{.33}$	some	$\frac{.34}{.10}$	little	.5	Area C Lower c.l.	444
Prairie SN	fused shale	$\frac{?}{1.94+}$	1.36	.37	$\frac{1.26}{.53}$	yes	$\frac{.50}{.23}$	some	1.0	Garratt Middle c.l.	1387
Prairie SN	KRF	2.04	1.40	.33	$\frac{1.08}{.25}$	some	$\frac{.49}{.31}$	yes	.8	Garratt Middle c.l.	1469
Prairie SN	SRC	?	?	.26	$\frac{1.27}{.34}$	much	$\frac{?}{.28}$	some	.3	Area C Lower c.l.	4541
Plains Tr.	chalc.	1.89	--	.32	$\frac{1.29}{--}$	little	--	--	.6	Area C Upper c.l.	3790
Fragment	KRF	?	?	.19	?	?	?	?	.1	Area A Middle c.l.	1506
Fragment	SRC	?	?	.28	?	?	?	?	.3	Area C Upper c.l.	4445
Preform	fused shale	$\frac{?}{2.01+}$	1.2	.34	1.73	no	$\frac{.48}{.30}$	no	1.2	Garratt Upper c.l.	1149

Table 4: Projectile point data for the Prairie/Plains Side-notched levels at the Davies and Garratt sites

from the Davies and Garratt sites. Three of these can be classified as knives, four are assumed to be crude cutting tools, one is a possible point preform, and one is the neck fragment of a hafted item, possibly a point. Data for these and other non-projectile tools are presented in Table 5.

One of the knife-like tools was recovered from the lower cultural layer of Area C, at the Davies site (Figure 29a). This tool is composed of white Swan River chert, and contains a number of imperfections and vugs (holes lined with quartz crystals) although the chert itself is relatively fine grained. The biface has an asymmetrical ovate shaped outline, and is bifacially worked all along one edge, and unifacially worked along the opposite side towards the tip only. A number of hinge fractures are evident along the bifacially worked edge - these appear to be a function of the lithic raw material and the thickness of the blank. The bifacially worked edge is quite jagged and sharp to the touch, although the edge angle of the tool is close to 45 degrees. The second knife, from the Garratt site, is of silicified peat (Figure 29b). It also has an asymmetrical ovate outline, and is snapped off towards the narrow end - it may have once contained a hafted basal element. This tool is bifacially worked along all edges except the broken end. Flaking is generally broad and shallow and frequently terminates in hinge fractures, undoubtedly due to the coarse, layered nature of the material. There are a number of tiny flakes along the edge with the greatest degree of convexity. These are of the type that may result from cutting a relatively hard substance such as bone or antler.

CLASSIFICATION			METRICS			EDGES		CONTEXT	
Tool Type	Shape	Raw Material	Length/Width	Max. Thick	Wt.	Edge	Edge Angle	Cat. #	Provenience
biface: knife	S0	SRC	<u>2.96+</u> 1.75	.80	4.1	2 bi	60-70°	2	Davies: surface
biface: knife	A0	SRC	<u>4.44</u> 2.32	.90	8.1	1 bi 1 uni	50°	3971	Davies: Area C
biface: knife	A0	silicified peat	<u>3.98+</u> 2.09	.84	7.3	2 bi	50°	1159	Garratt
biface: chithos	S0	quartzite	<u>10.17</u> 10.31	4.65	625.4	3 bi	65°	4348	Davies: Area C
biface: chithos	A0	quartzite	<u>9.89</u> 9.82	3.31	368.2	1 bi	60°	1632	Garratt
biface: preform	T	silicified peat	<u>2.46</u> 1.91	.53	2.3	2 bi	40-45°	3791	Davies: Area C
biface: unknown	?	silicified peat	<u>?</u> 2.95	.56	3.5	2 bi	30-40°	4601	Davies: Area C
biface: unknown	?	KRF	<u>?</u> 1.48	.44	0.6	2 bi	45°	1216	Garratt
biface: unknown	RT	silicified peat	<u>1.93+</u> 1.39	.40	0.8	1 bi 1 uni	40-50°	1295	Garratt
uniface: endscraper	T	KRF	<u>2.76</u> 2.63	.60	4.4	3 uni	70°	3	Davies: surface
uniface: endscraper	T	chert	<u>1.56</u> 2.08	.84	2.3	3 uni	65°	4332	Davies: Area C
uniface: endscraper	T	SRC	<u>1.49</u> 1.90+	.54	1.5	3 uni	50°	1293	Garratt
uniface: endscraper	RS	basalt	<u>2.23</u> 2.34	.59	4.9	2 uni 1 bi	80°	6	Davies: surface
uniface: endscraper	RS	chert	<u>2.33</u> 2.35	.68	4.8	3 uni	65°	3827 4446	Davies: Area C
uniface: endscraper	?	chalcedony	<u>?</u> 2.31	.71	1.3	?	55°	4383	Davies: Area C
uniface: endscraper	?	KRF	<u>1.43</u> ?	.67	.9	?	70°	5	Davies: surface
uniface: endscraper	0	silicified peat	<u>2.63</u> 1.45	.44	1.9	2 uni	40-50°	4731	Davies: ARMS S.T.
uniface: drill	?	KRF	<u>1.87</u> 1.87	.58	1.7	all uni	30°	1217	Garratt

Table 5: Non-projectile tools for the Prairie/Plains Side-notched levels

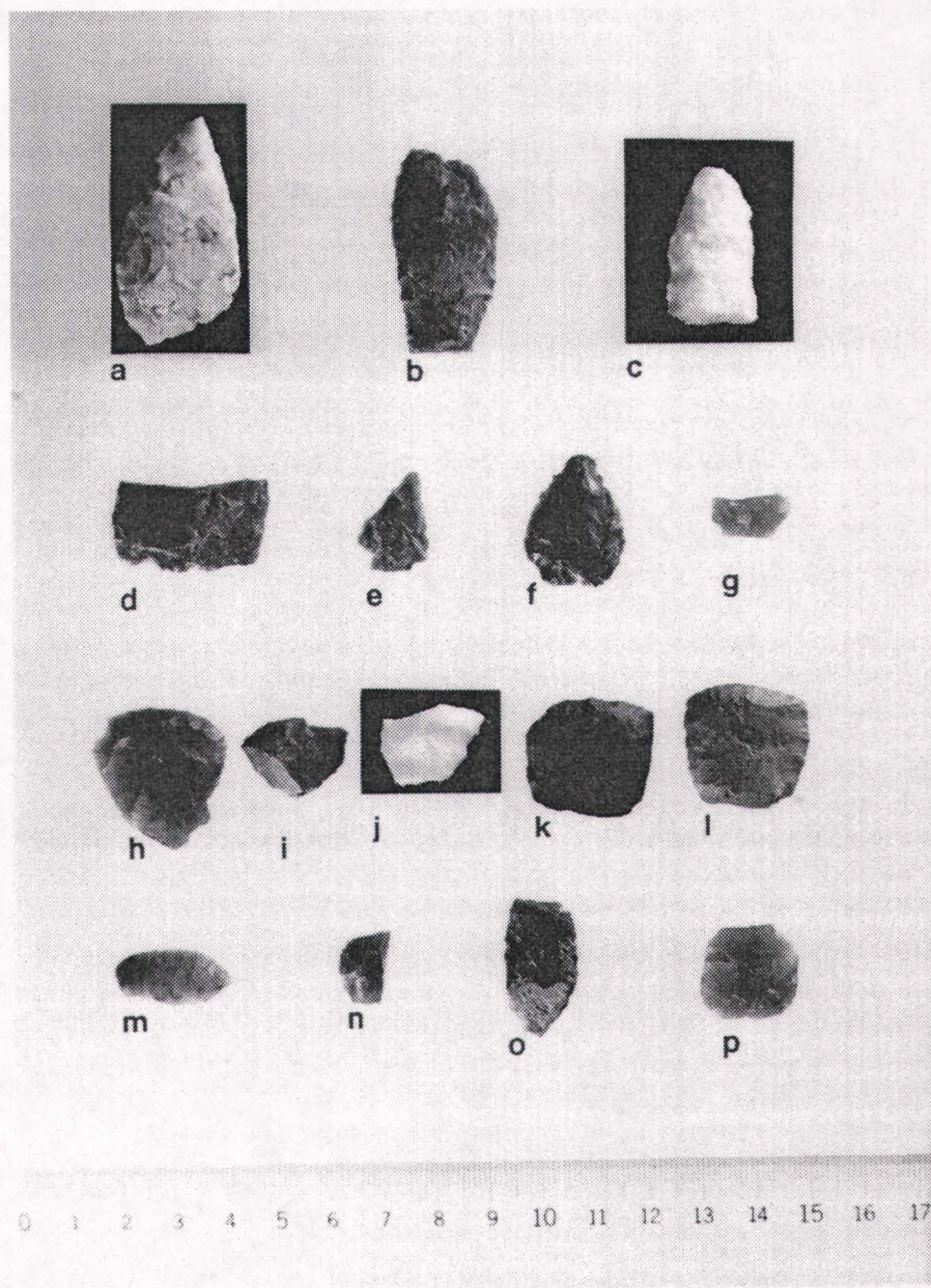


Figure 29: Davies and Garratt site non-projectile tools from the Prairie/Plains Side-notched levels:
 a - g: bifaces,
 h - n: endscrapers,
 o: sidescraper,
 p: uniface fragment.

Alternatively, such a flaking pattern could result from running a hard object across the blade, either to dull the edge for hafting or holding, or to strengthen the edge by removing the sharpest, most unstable portion of the blade. Both edges are still relatively sharp; the edge with the least degree of convexity is slightly serrated, and shows some macroscopic evidence of use-polish. Edge angle is difficult to determine due to the fact that the tool is badly hinge fractured along the outline of one face, but appears to average around 50 degrees. A crude Swan River chert biface (Figure 29c) was recovered from the surface of the Davies site. The flaking on this artifact is inconsistent, but mostly quite crude, giving it an unfinished appearance. Although the edges are somewhat jagged, the edge angle is quite obtuse, and neither side appears to have been thinned enough to produce a functional cutting edge. No evidence of use polish is visible macroscopically. This artifact is somewhat long and too thick to have been intended as a point blank; it is possible that it is an unfinished or unsuccessful attempt at making a cutting tool or knife.

A silicified peat biface fragment (Figure 29d) was recovered from the lower cultural layer of Area C of the Davies site. The fragment recovered appears to be the base of a fairly large biface. The basal portion is relatively square and the sharpened edges are parallel. Flaking is erratic, several well-executed ribbon-like flakes extend across the blade on one face, but the base and the opposite face show rougher flaking, with numerous hinge fractures. The tool is relatively thin, considering the width of the blade, and

the edge angle is relatively acute, ranging from 30 to 40 degrees. The edges are still relatively sharp; one edge has been slightly dulled, but neither side shows macroscopic evidence of polish. A bifacially worked silicified peat fragment (Figure 29e) was recovered from the middle cultural horizon of the Garratt site. This artifact shows broad irregular flaking across one face, and marginal retouch along one edge of the other face. The fragment comes to a relatively sharp point; it is uncertain whether this is a coincidental result of breakage from a larger tool, or if the item was being shaped as an awl or drill bit. The edges are quite sharp, with no visible evidence of use, and edge angles vary from 40 to 50 degrees.

A teardrop shaped biface (Figure 29f) was recovered from the upper cultural layer of Area C of the Davies site. This artifact is formed from a fairly high quality piece of silicified peat. It is well shaped, relatively symmetrical, and flaked across the entire surface of both faces. Flaking is quite irregular, but the flakes are all relatively large, with little evidence of edge retouch. Edges are sharp and no evidence of use wear is visible. Edge angles vary from 40 to 45 degrees. This biface is thought to have been intended as a point preform. The presence of a number of faults in the raw material may have hindered the shaping process and prompted abandonment of the artifact.

A bifacially worked Knife River flint fragment (Figure 29g) was recovered from the middle cultural layer of the Garratt site. This fragment appears to have been the neck of a hafted tool, possibly a projectile point. The flaking is broad and shallow and little edge

retouch is visible, possibly due to the portion of the tool present. One edge is slightly crushed and the other is sharp; edge angles range from 40 to 50 degrees.

Two quartzite choppers were recovered (Figure 30), one from the middle cultural layer of Area C at the Davies site and the other from the lowest cultural layer of the Garratt site. Both tools are worked on roughly half the circumference, with the majority of the flaking concentrated on one face, and a few sporadic flakes on the other face. It is possible that these may have partially functioned as cores, although the Davies site specimen is extremely dulled along the edges to the point that it must have been extensively used as a chopper or in some smashing or pounding function.

Unifaces

Nine unifaces were recovered from the Davies and Garratt sites for this period. Seven of these are end scrapers and one is a uniaxially worked flake. Uniface data is presented in Table 5.

The endscrapers have been divided into two types; dorsally finished forms and dorsally unfinished forms. Three dorsally finished forms were recovered (Figure 29 h - j): a Knife River flint specimen from the surface of the Davies site ploughed field; a brown chert specimen from the upper cultural layer of Area C at the Davies site; and a white Swan River chert endscraper from the middle cultural layer of the Garratt site. This type of scraper is roughly triangular in shape, with the artifact expanding significantly towards the working edge. They are worked all across the dorsal surface. The working edge is significantly steeper than the other

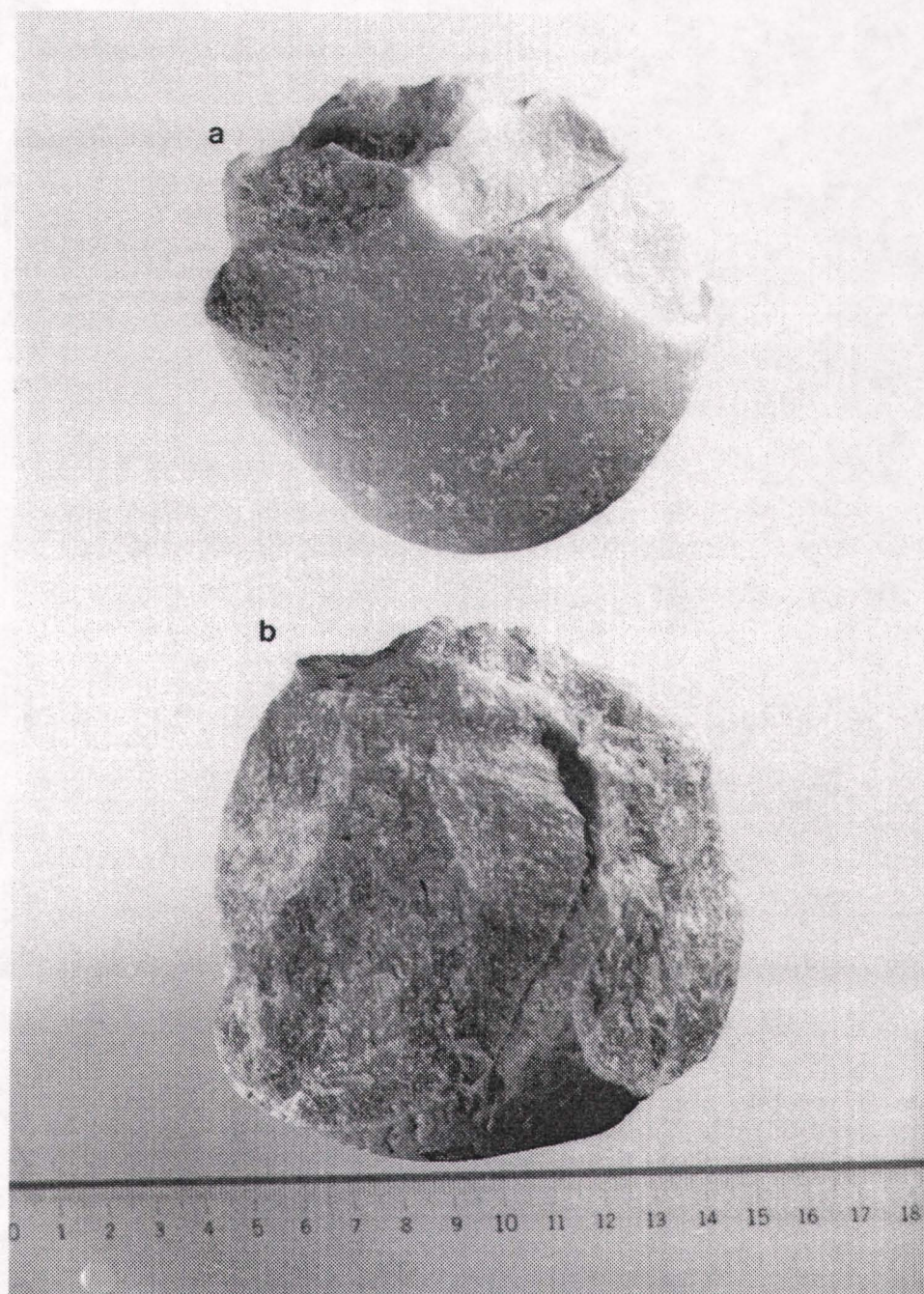


Figure 30: Quartzite choppers from the Prairies/Plains Side-notched levels at the Davies and Garratt site.

edge angles, and the flakes along the working edge are generally parallel and oriented perpendicular to the working edge. The flaking across the rest of the tool results in considerably longer and narrower flake scars, converging at a point close to the centre of the working edge, which is also the point of maximum thickness. The cross section of these artifacts is triangular.

Two dorsally unfinished endscraper forms were recovered (Figure 29 k & l): a basalt specimen was collected from the surface of the ploughed field, and a chert scraper was found in two fragments in the upper cultural layer of Area C. These scrapers are more or less square in shape. Flaking is generally limited to three edges of the tool, and the edge opposite the working edge is unfinished. Flaking is perpendicular to the edges, and there is no significant difference in thickness of the tool towards the working edge. These tools are roughly quadrilateral in cross section.

Two endscraper fragments were recovered (Figure 29 m & n): a light brown agate fragment was found in the upper cultural layer of the Area C units and a Knife River flint specimen was collected from the surface of the ploughed field.

One uniaxially worked silicified peat flake (Figure 29 o) was recovered from the second ARMS shovel test in the centre of the ploughed field. This specimen is roughly ovate, and is flaked across approximately two-thirds of the dorsal face, one-third was left with cortex. One side of the flake is relatively crushed, with multiple hinge fractures. This tool was probably used as a sidescraper.

Finally, a uniaxially worked Knife River flint tool was

recovered from the middle cultural layer of the Garratt site (Figure 29p). It is roughly circular, and appears to have once had an awl or drill like extension which has been snapped off.

Marginally Retouched Stone Tools and Flakes

This class includes all lithics which show evidence of flaking or use retouch along one or more edges but not across the face of the artifact. It includes both artifacts that have actually been shaped along the margins, and unshaped flakes which show evidence of use retouch or polish. It should be noted here that this category may contain crude point preforms or blanks; one of the Knife River flint flakes recovered from the ploughed field could conceivably be a point blank. There is also a possibility that the silicified peat items in this category are actually biface fragments. Since this raw material tends to break in layers, flaking across the face of the artifact would be extremely difficult to identify.

Nine marginally retouched lithic artifacts were recovered from the Prairie and Plains Side-notched layers at the Davies and Garratt site. Eight of these were from the Davies site; three from the ploughed field and five from Area C. One silicified peat retouched flake was recovered from the Garratt site.

Cores

This class of artifacts consists of those fragments of lithic debitage which have multiple negative flake scars and one or more discernable striking platforms, but which do not show obvious traces of use wear or shaping towards a conventional tool.

For purpose of classification, the cores from the Turn have been

divided into bipolar percussion cores and unifacial percussion cores. Data for the cores from the Prairie/Plains Side-notched layers are presented in Table 6.

The bipolar core is by far the most common type in the assemblage from the Turn. Of the 23 cores from the Prairie/Plains Side-notched occupation, 19 (83%) show definite evidence of bipolar percussion (Figure 31 a - j, m - v), and two core fragments have also been tentatively included in this class on the basis of size and other similarities (Figure 31 k & l). Four of the cores in the bipolar core class are roughly rectangular in outline and either very thin or slightly wedge shaped in lengthwise cross section. The wedge shaped cores (Figure 31 a & b) display an obvious striking platform on one end and battering or crushing on the opposite end; on the very thin specimens (Figure 31 c & d) both ends or platforms are crushed and battered, creating a sharp, slightly concave surface. These cores appear to be similar to the 'piece esquilles' identified by Morgan (1979: 277), Adams (1977: 57) and by Milne-Brumley (1978: 80). However, the term appears to carry some implication that the primary function of the artifact was as a tool rather than a core. The most commonly quoted Canadian reference on the subject, MacDonald (1969:88) states that:

Piece esquilles are generally considered to combine several functions, primarily as a wedge but secondarily as a slotting tool, both of which are associated with the groove and splinter technique of working bone, antler, ivory and hardwood.

Morgan includes her 'piece esquilles' class with her utilization series (1979: 227), and Adams mentions that "the battering of these artifacts may be from use" (1977: 77). However, Milne Brumley feels

RAW MATERIAL	CORTEX PRESENT	LENGTH/WIDTH	MAX. TH.	WT.	# PLATFORMS	CAT. #	PROVENIENCE
fused shale	25%	1.95 1.46	.61	2.0	2	1234	Garratt: middle layer
fused shale	30%	2.42 2.09	.73	4.6	2	9	Davies: surface
silicified peat	0	2.19 2.28	.44	2.9	2	4688	Davies: surface
swan river chert	0	2.48 2.03	.51	3.6	2	10	Davies: surface
fused shale	0	2.23 1.89	.97	3.8	2	1294	Garratt: middle layer
fused shale	0	1.92 2.11	.51	2.0	2	1546	Garratt: upper c.l.
chalcedony	50%	2.53 1.61	1.00	4.2	2	13	Davies: surface
fused shale	0	2.85 1.33	.85	2.9	2	1161	Garratt: upper c.l.
swan river chert	0	1.75 1.49	.55	1.2	2	4236	Area C upper c.l.
swan river chert	0	2.50 2.34	.80	5.6	2	4	Davies: surface
swan river chert	0	2.95 2.09	.87	5.9	2	1221	Garratt: lower c.l.
unidentified	2%	2.00 1.47	.55	1.7	2	1204	Garratt: lower c.l.
pebble chert	40%	2.62 2.19	.82	5.1	2	11	Davies: surface
pebble chert	50%	2.33 1.91	.75	3.3	2	14	Davies: surface
fused shale	0	1.15 2.07	.72	1.4	1	1162	Garratt: upper c.l.
fused shale	70%	1.72 2.12	.73	2.3	1	4061	Garratt: upper c.l.
dolomite	25%	9.69 12.28	4.65	680.5	3	22	surface
swan river chert	0	2.55 1.64	1.43	4.7	2	1352	Garratt: upper c.l.
KRF	0	2.37 1.28	.50	1.5	2	1564	Area A unknown
pebble chert	50%	4.42 3.46	1.43	26.2	2	3886	Area C lower c.l.
swan river chert	0	3.09 3.12	1.67	14.8	2	4190	Area C lower c.l.
silicified peat	0	1.70 1.27	.43	0.8	1	4343	Area C lower c.l.
A.F.L.	5%	2.49 2.16	1.02	5.2	2	4195	Area C lower c.l.

Table 6: Core attributes from the Prairie/Plains Side-notched levels

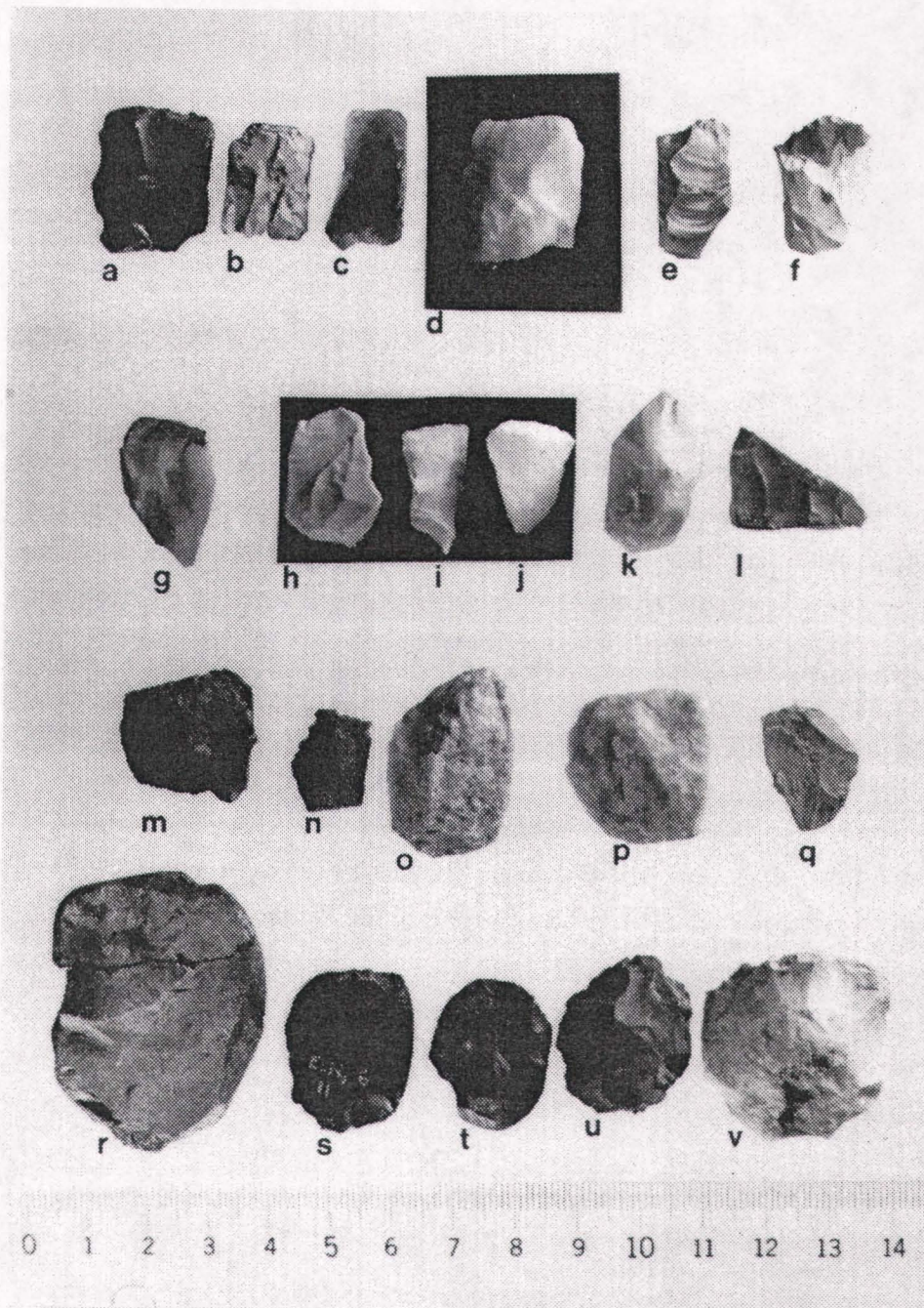


Figure 31: Bipolar cores from the Prairie/Plains Side-notched levels

that "first and foremost they serve as cores for the removal of flakes" (1978: 80). I favour a similar interpretation for the above mentioned cores from the Turn, for a number of reasons. The Davies and Garratt sites have not produced adequate evidence of a 'groove and splinter' industry for bone, antler, etc. to support the functional interpretation specified by MacDonald and implied by Morgan. On the other hand, more than ample evidence has been recovered for a bipolar core reduction industry at the Turn. In fact, bipolar percussion appears to be the standard method of core reduction at the Turn. A significant number of cores were recovered which display bipolar percussion, but which do not appear to be suitably shaped to serve as wedges or anything other than the production of flake blanks.

It should be noted that the bipolar core industry at the Turn favored fine grained materials, especially fused shale. Of the 19 cores recovered from the Garratt and the Davies site, seven are fused shale, six are Swan River chert, three are pebble chert, one is chalcedony, two are silicified peat, one is Knife River flint, one is altered felsic lava and one is of an unidentified fine grained material. All of these cores are extremely small (average weight is 3.28 grams and the range is from 1.2 to 5.9 grams), whereas the only unifacial percussion core from the Turn weighed 680.5 grams. The most logical conclusion regarding the function of the bipolar cores at the Turn, therefore, is that they are the result of an effort to maximize the return from high-grade lithics. Bipolar percussion is one of the easiest ways to produce flake blanks from

very small cores. It is also more likely to produce a flake that is equal or close to the length of the core - an important consideration when dealing with small cores. Bipolar percussion may have been used on exhausted cores or shatter which had been reduced by unifacial percussion. However, with the exception of the Swan River chert cores, the raw material types and frequency of cortex cover on the core assemblage at the Turn would indicate that the source material was likely recovered in small nodules or pebbles, and that bipolar percussion was the main reduction technique used. Milne Brumley (1978: 81) states that the bipolar percussion core/'piece esquilles' technique at the Saamis site:

involves nodules mined from a bedrock source and lacking surface cortex and it also involves small chert pebbles, recovered from stream gravels.

Finally, it should be noted here that the majority of the bipolar cores were recovered from the upper two cultural levels at the Carratt site (seven) and the surface of the Davies site ploughed field (seven). Only two cores were recovered from the buried cultural levels at the Davies site, both from the upper cultural layer of Area C. This pattern is likely related to differences in the activities carried out in the various excavation areas.

One unifacial percussion core was recovered, a surface discovery from Area B (Figure 32). This core was formed from a large split dolomite cobble, and had numerous large flakes removed from one edge in a fairly uniform manner, to form a rather odd awl-like point. The function of this point on such a large object is obscure, and may be fortuitous.

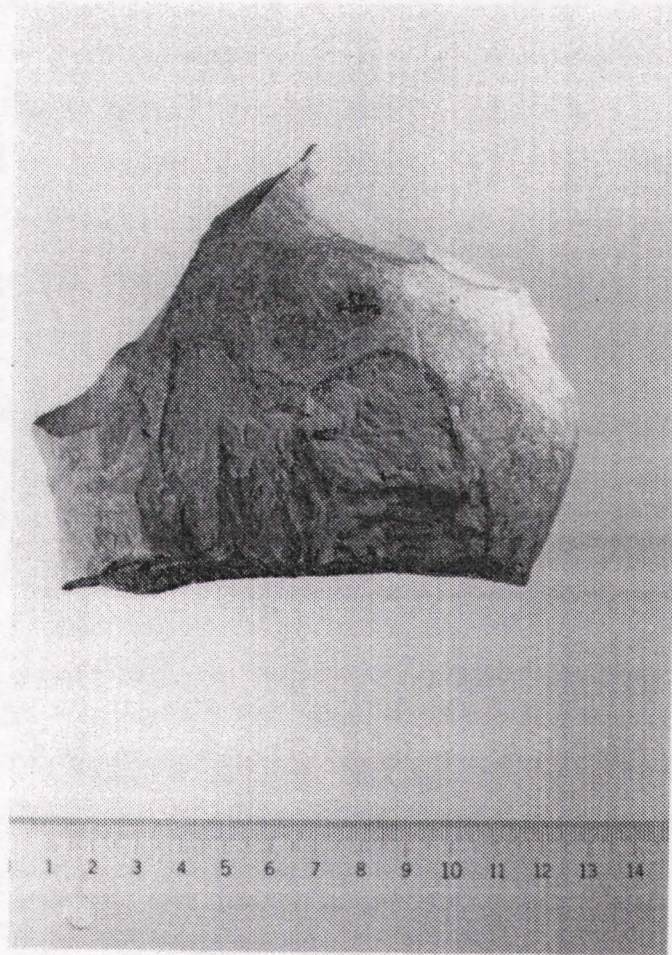


Figure 32: Unifacial core from the surface of the Davies site.

Flakes And Shatter

This category consists of all lithic items lacking evidence of the deliberate shaping or retouch present in tools and utilized flakes, and lacking multiple negative flake scars and striking platforms present in cores.

A total of 1444 lithic items were classified as flakes and shatter, weighing approximately 2.7 kilograms. This category formed the largest percentage of the lithic assemblage both in terms of quantity and weight.

Frequency of cortex in this category was objectively judged as low, and for this and other practical reasons, analysis of reduction stages was not attempted within the scope of this study.

6.1.3 Ceramics

The surface and the Prairie/Plains Side-notched levels produced a total of 341 potsherds from the Davies site and 61 potsherds from the Garratt site during the 1984/85 investigations. A minimum of three vessels from the Davies site and three vessels from the Garratt site were identified. The attributes of the ceramic vessels for this period are summarized in Table 8. Photographs are presented in Figures 33 and 34.

The most complete vessel, Vessel One (Figure 33) was recovered from the Davies site from the upper cultural level of Area A, at the edge of the upper cutbank. A number of sherds from this vessel were also screened from the slumpage at the base of the cutbank. Vessel One has a complex outline; a definite shoulder with an angle of 120

Vessel #	Provenience	# Shards			Temper	Construction		Surface Finish	Decoration
		Rim/Neck	Shoulder	Body +Urid		Type	Thick (cm)		
1	Area A Upper c.l.	11	14	235		patch	.84-.39	smoothed	alternating cord-wrapped tool impression on edges of lip
2	Area E Upper c.l.	0	0	5	?	?		smoothed fabric impressed?	?
3 a	Area C Middle c.l.	2	-	-	granite	?	.87	smoothed fabric impressed?	deep diagonal incision across lip
3 b	Area C Middle c.l.	6?	-	-	granite	?	.53	smoothed fabric impressed?	three horizontal incised lines
3 c	Area C Middle c.l.	1			granite	?	.95	smoothed fabric impressed?	diagonal incised line
3 d	Area C Middle c.l.		1	62	granite	?	.45	smoothed fabric impressed?	N/A
4 a	Garratt Upper c.l.	10	-	-	feldspathic granite	?	1.3	smoothed	diagonal slashes across outer edge of lip
4 b	Garratt Upper c.l.	-	-	46	feldspathic granite	?	.46	smoothed stamped?	N/A
5	Garratt Upper c.l.	-	-	1	?	?	.34	funneled?	N/A
6	Garratt Middle c.l.	1	-	3	feldspathic granite	?	.56	?	N/A

Table 7: Ceramic attributes from the Prairie/Plains Side-notched levels at the Davies and Garratt Sites.

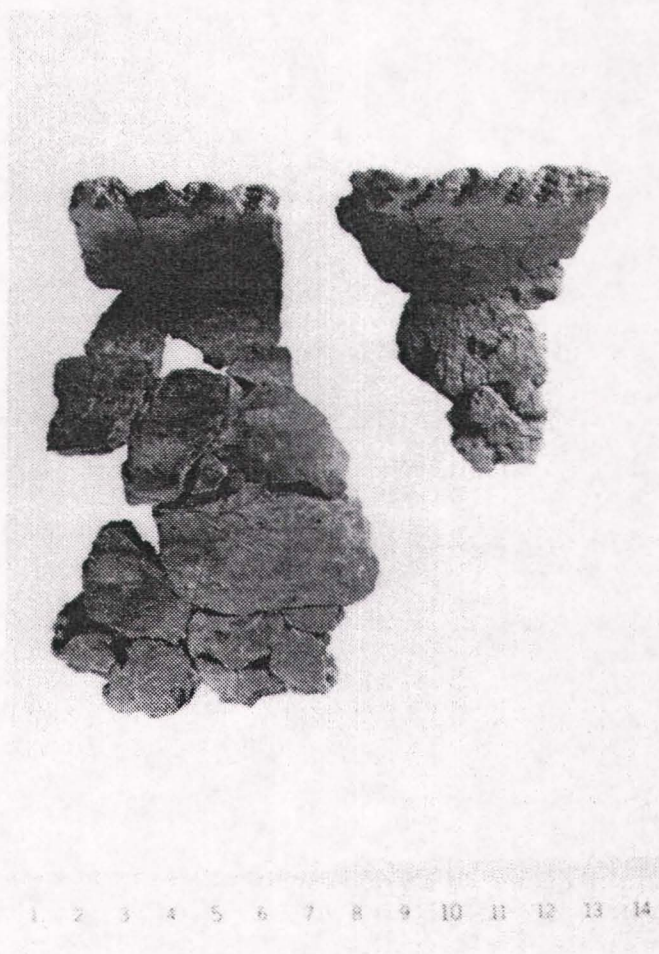


Figure 33: Vessel One from the Prairie/Plains Side-notched levels at the Davies and Garratt sites.

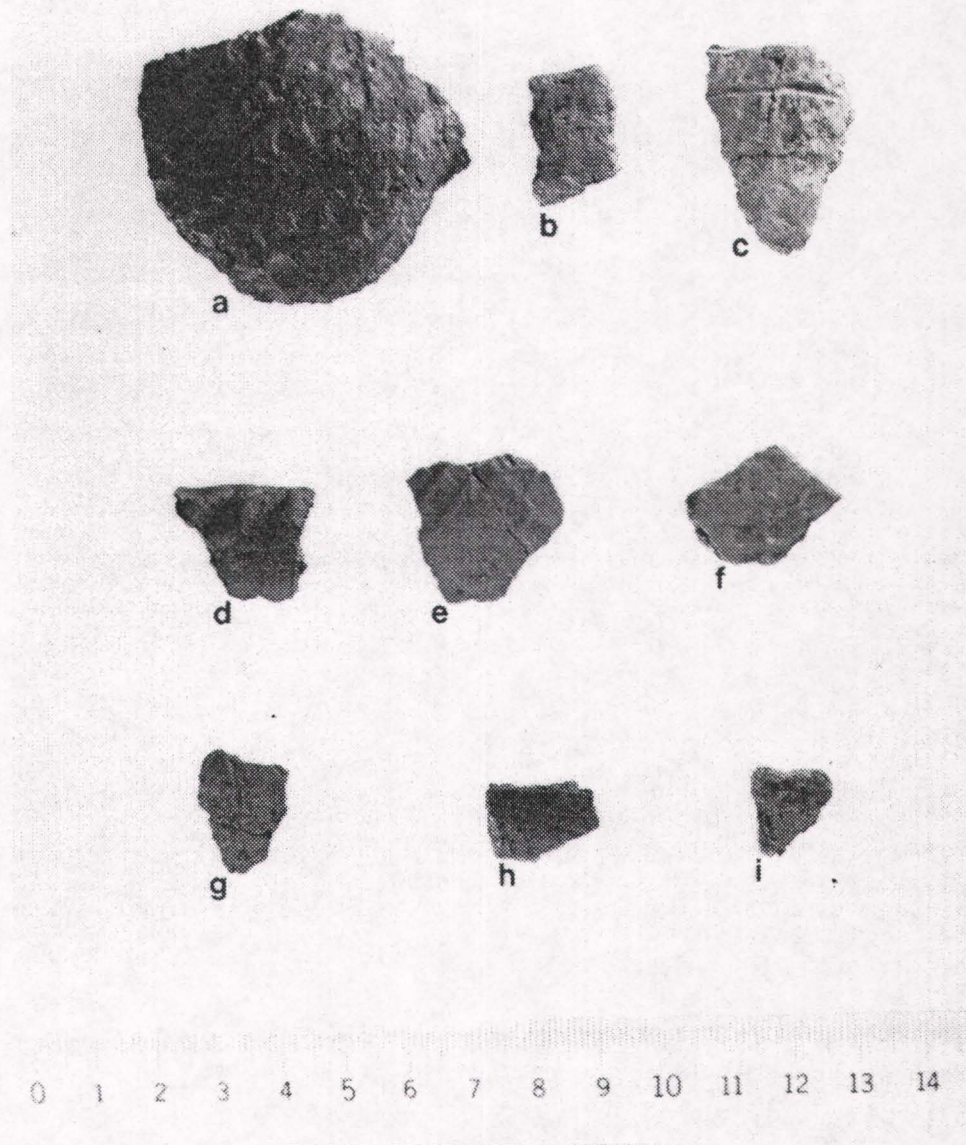


Figure 34: Vessels Two to Seven from the Prairie/Plains Side-notched levels at the Davies and Garratt Sites.

degrees, and a rim which flares outwards at a right angle to the upper shoulder. Height of the vessel is roughly estimated at 18 cm. The surface finish is smoothed, with a somewhat rippled effect left by the fingers or a smoothing instrument. The neck is undecorated. The lip is decorated by diagonal cord-wrapped-tool incisions alternating on the inner and outer corner of the lip, producing a scalloped effect.

Vessel Two is represented by five sherds recovered from the upper cultural level of Area C. Little can be determined from this small sample, save that the surface finish appears to have been a smoothed-over fabric or cord wrapped paddle impression.

The lower cultural level of Area C contained a number of potsherds with a distinctive smoothed fabric impressed surface. It is likely that these sherds all represent a single vessel, given the similarity of surface finish, but there were not enough sherds to fit together the rim, neck and body portions. These sherds have therefore been designated Vessel Three, but assigned subscripts 'a' through 'd' for the various design elements. Vessel Three-a consists of two small rim sherds with deep diagonal incisions across the lip. Vessel Three-b is made up of six sherds containing two to three incised parallel lines. These sherds are possibly portions of a straight neck, decorated with three parallel incised lines. One neck sherd, Vessel Three-c, has a portion of a diagonal incised line which terminates at the point where the neck joins the body. The sherd thickens considerably at this point, and flares outward at an estimated angle of 130 degrees. Finally, 62 body sherds and one

shoulder sherd have been designated Vessel Three-d. These sherds are undecorated, but have a surface finish characterized by relatively deep, rounded impressions; either a basket-weave impression, or one made by a nubby, coarse fabric or coarsely wrapped paddle. The single shoulder sherd is curved at one end at a very rounded angle of approximately 140 degrees. This would indicate that the vessel was probably relatively globular in shape, rather than having a true shoulder such as that of Vessel One.

Three types of sherds were recovered from the upper cultural level at the Garratt site. The most plentiful were body sherds with a check stamped surface finish. The paste qualities and thickness of these sherds are similar to a number of rim sherds from the same level. The rim sherds have a thickened, flattened lip, with deep, somewhat irregular diagonal impressions or slashes along the outside corner of the lip. These are thought to be from the same vessel, designated Vessel Four. It should be noted here that a few rim sherds recovered from the screenings of the middle cultural level are extremely similar to those described above. This is probably due to some mixing between the upper and middle cultural levels which resulted from the original shovel test that revealed these buried deposits.

One rather unusual body sherd, designated Vessel Five, was also recovered from the upper cultural level. It is much thinner in cross section and darker in colour than the other ceramics in that level, and it has an unusual surface finish that appears trailed or funneled; possibly resulting from a thong-wrapped paddle.

Finally, three body sherds and one shoulder sherd, Vessel Six, were recovered from the middle cultural level at the Garratt site. These sherds have a roughened surface finish overlain by a certain degree of scraping or smoothing which, on the few sherds recovered, produced a criss-cross appearance superficially resembling a woven material.

The ceramics from these levels are generally consistent with the Prairie/Plains Side-notched time period for this area. In spite of the very late dates on some of the levels in which they were found, they are generally well made, with none of the massive thickness and coarse granite temper characteristics often attributed to the later ceramic period on the Northwestern Plains. In fact, the presence of certain attributes, such as check stamping and incised lines, and the significant absence of others, such as punctates, suggests an affiliation with the Mortlach culture. Assemblages with Plains Side-notched points and Mortlach-type ceramics are quite common in the general area, but are only beginning to be recognized as such. Until a comprehensive study of Mortlach ceramics has been undertaken for the area, such an affiliation remains speculative.

6.1.4 Faunal Assemblage

For the Prairie/Plains Side-notched levels at the Turn, only buried faunal remains associated with a prehistoric occupation have been included in this analysis. All of the excavated prehistoric occupations contained faunal material.

A total of 23,310 faunal elements and bone fragments weighing

approximately 16.7 kg were recovered during the 1984/1985 investigations at the Turn. The majority of the faunal remains consisted of small bone fragments which could not be identified as to species or element. However, a substantial amount of identifiable remains was recovered, and some meaningful analysis was possible.

In terms of methodology, faunal materials were first identified as to genus and species. Where this was not possible, an attempt was made to identify the faunal remains to broader taxonomic categories (ie. bird, amphibian, medium or large mammal, etc.). Similarly, bones were identified as to side and element, and failing such specific identification, to broader element categories (ie. long bone shaft fragment, cranial/axial fragment, etc.). In addition, relative quantities of burnt and unburnt bone were calculated, and all faunal material was sorted into five size grade categories. The presence of immature and fetal remains were noted, as were butchering marks or canine gnawing marks.

An overall summary of the faunal material is presented here, followed by descriptions of the faunal material from each of the cultural occupations in the various excavation areas across the site. It should be noted that the project constraints described in the first chapter are probably most problematic with respect to the faunal analysis. Since it is not possible to match up the numerous occupation levels in the four excavation areas (except in broad cultural historical terms), it is virtually impossible to perform any general faunal population studies such as age and sex profiles and minimum number of individuals (MNI) counts. None of the excavated

areas were over five square meters, and few of the MNIs for any of the species present were over one, with the exception of the rodent population (probably intrusive). Some indications of seasonality can be noted in relation to the presence of fetal or immature remains, but these lack the backing of a large population sample.

The identified animal classes and their relative proportions in the faunal assemblage are outlined in Table 8. The unidentified elements and mammal bone fragments make up the great majority of the assemblage. Mammal remains make up by far the greatest mass or percentage by weight. Since the more fragmented bone is likely to be manifested in a large number of small fragments with little identifying features, it is not surprising that the unidentified bone is most numerous or makes up the greatest percentage by number. The majority of the unidentified bone is probably mammal bone since remains from other classes represented at the site are generally relatively distinctive and likely to have been recognized as such.

Mollusc remains, probably freshwater clam or Unio sp., were recovered from two different excavation areas. These were fairly fragmented and probably represented only one individual in each area. Judging from their infrequency in the sample, they do not seem to have been a regular food item, and their presence may be related to use as decoration or may be naturally occurring considering the proximity of the river.

Twenty items were identified as fish remains, the majority of these being vertebrae and scales. I was unable to identify the genus or species for these items. Since the fish remains tend to be quite

	unidentified	Mammalia (mammal)	Aves (bird)	Amphibia (amphibian)	Pices (fish)	Mollusca (mollusc)
Area A upper level:						
% by #	87.4%	12.4%	0.2%	-	-	-
% by weight	41.0%	58.8%	0.2%	-	-	-
Area A middle level:						
% by #	64.7%	34.8%	<0.1%	-	0.2%	0.2%
% by weight	16.9%	83.0%	0.1%	-	<0.1%	<0.1%
Area A lower level:						
% by #	33.3%	63.5%	-	1.6%	1.6%	-
% by weight	0.4%	99.6%	-	<0.1%	<0.1%	-
Area B upper level:						
% by #	82.1%	17.7%	0.3%	-	-	-
% by weight	53.0%	46.7%	0.3%	-	-	-
Area B middle level:						
% by #	72.6%	26.4%	1.0%	-	-	-
% by weight	27.0%	72.5%	0.5%	-	-	-
Area B lower level:						
% by #	70.0%	24.4%	5.6%	-	-	-
% by weight	13.1%	85.4%	1.5%	-	-	-
Area C upper level:						
% by #	61.9%	37.4%	0.6%	-	-	-
% by weight	14.2%	85.7%	0.1%	-	-	-
Area C lower level:						
% by #	61.7%	38.1%	-	-	-	0.3%
% by weight	13.3%	86.6%	-	-	-	0.1%
Garratt site upper level:						
% by #	48.4%	51.6%	-	-	-	-
% by weight	4.0%	96.0%	-	-	-	-
Garratt site middle level:						
% by #	87.9%	12.0%	-	-	<0.1%	-
% by weight	20.4%	79.6%	-	-	<0.1%	-
Garratt site lower level:						
% by #	25.0%	75.0%	-	-	-	-
% by weight			-	-	-	-
Total:						
% by #	67.7%	29.7%	0.4%	<0.1%	0.1%	0.1%
% by weight	17.1%	82.7%	0.2%	<0.1%	<0.1%	<0.1%

Table 8: Faunal classes from the Prairie / Plains Side-notched assemblage.

small and not easily identified, it is likely that the majority of these types of faunal remains would have been lost in the screening process. The fish remains that were recovered were mostly from the fine screening. As a result, it is possible that fish composed a larger portion of the diet than is apparent from the faunal sample retrieved.

One amphibian vertebra was identified from the fine screen remains. Due to the small sample and the lack of ethnographic data on use of amphibians by Plains Indians, it is impossible to say whether this could represent a food item. It may be intrusive given the proximity of the river.

One hundred and one bird bones were recovered across the various areas of the site. The majority of these were unidentifiable long bone shaft fragments although some elements could be identified. An attempt was made to identify genus and species for the known elements. However, the scarcity of available comparative collections and the condition of the remains made this impossible. It is still possible that some of the bird elements may be identified as to species in the future, given adequate comparative collections and expertise. Although no butchering marks or charring was detected on the bird remains, they are found in numerous levels and excavation areas throughout the sites, it is likely that their presence is not fortuitous. Mandelbaum refers to the hunting of waterfowl during moulting season (1979: 69-70) and it is quite possible that the bird remains at the Turn resulted from similar practices.

A substantial portion of the mammal remains could be identified

as to species or at least genus. The relative quantity of the various mammal genera identified are described in Table 9. The majority of the identified mammal remains could only be identified to the level of medium or large mammal. This identification was made on the basis of size of bone fragment and thickness of bone cortex. Although this category consisted almost wholly of fragmented items which could not be precisely identified as to element and side, the morphology of the bone fragments allowed for some classification into general categories, such as axial skeleton fragments, cranial fragments and long bone shaft fragments as shown in Table 10. These categories are relevant to the determination of the presence of bone-grease manufacturing activity areas.

Numerically, the second most common animal represented in the faunal sample are rodents. Two species of rodent were identified from the Turn, Microtus pennsylvanicus and Spermophilus richardsonii. Rodents were the only animals in most of the occupation levels to which a minimum number of more than one could be assigned. However, it is most likely that the rodent remains are intrusive. Rodents do not appear to have been a popular subsistence item; they are seldom mentioned as such in ethnographic references on Plains Indian groups. In the excavations at the Turn, they were more frequent in the upper layers and were often found in association with disturbances that could be attributed to rodent burrows. In addition, the Turn area has an extremely high extant population of rodents. For this reason, no further analysis of rodent remains is attempted here.

Two metapodial fragments were identified as Lepus sp. or rabbit.

	<u>Bison</u>	<u>Homo</u>	<u>Canis</u>	<u>Vulpes</u>	<u>Lepus</u>	<u>Rodent</u>	Medium/Large Mammal
Area A upper level:							
% by #	3.2%	-	0.6%	-	-	62.5%	33.7%
% by weight	62.7%	-	5.0%	-	-	3.2%	29.1%
Area A middle level:							
% by #	2.1%	0.3%	<0.1%	<0.1%	<0.1%	38.2%	59.3%
% by weight	54.3%	0.4%	<0.1%	<0.1%	<0.1%	1.7%	43.7%
Area A lower level:							
% by #	22.5	-	-	-	-	7.5%	70.0%
% by weight	95.6%	-	-	-	-	0.1%	4.3%
Area B upper level:							
% by #	1.9%	-	0.4%	-	-	31.8%	65.9%
% by weight	29.9%	-	<0.1%	-	-	1.7%	68.5%
Area B middle level:							
% by #	3.8%	-	0.4%	-	-	64.7%	31.1%
% by weight	74.0%	-	0.4%	-	-	2.4%	23.3%
Area B lower level:							
% by #	7.3%	-	-	-	0.5%	57.6%	34.6%
% by weight	88.9%	-	-	-	<0.1%	1.8%	9.3%
Area C upper level:							
% by #	2.0%	-	-	1.5%	-	0.2%	96.3%
% by weight	17.7%	-	-	0.2%	-	<0.1%	82.0%
Area C lower level:							
% by #	5.0%	-	0.2%	-	-	0.6%	94.2%
% by weight	23.5%	-	0.1%	-	-	0.1%	76.3%
Garratt site upper level:							
% by #	0.9%	-	1.7%	-	-	6.9%	90.5%
% by weight	36.3%	-	8.8%	-	-	0.5%	54.3%
Garratt site middle level:							
% by #	1.4%	-	-	-	-	1.0%	97.6%
% by weight	16.9%	-	-	-	-	<0.1%	83.1%
Garratt site lower level:							
% by #	33.3%	-	-	-	-	-	66.7%
% by weight	-	-	-	-	-	-	-
Total:							
% by #	7.3%	0.1%	0.1%	0.3%	<0.1%	25.0%	67.0%
% by weight	43.3%	0.1%	0.5%	0.1%	<0.1%	0.8%	51.2%

Table 9: Mammal classes from the Prairie / Plains Side-notched assemblage

	long bone	cancellous tissue	cranial/axial	unidentified
Area A upper level				
% by #	0.9%	0	0.9%	98.2%
% by weight	19.8%	0	5.7%	74.5%
Area A middle level:				
% by #	6.3%	8.2%	5.8%	79.8%
% by weight	33.5%	3.6%	14.8%	48.0%
Area B upper level:				
% by #	6.3%	8.2%	5.8%	79.8%
% by weight	33.5%	3.6%	14.8%	48.0%
Area B middle level:				
% by #	1.8%	6.2%	1.4%	90.6%
% by weight	20.8%	3.1%	7.5%	68.5%
Area B lower level:				
% by #	1.1%	8.8%	1.1%	88.9%
% by weight	6.8%	4.8%	4.5%	83.9%
Area C upper level:				
% by #	6.0%	4.8%	8.4%	80.8%
% by weight	38.1%	0.9%	13.0%	48.0%
Area C lower level:				
% by #	6.2%	2.5%	5.0%	86.2%
% by weight	40.2%	0.4%	17.3%	42.1%
Garratt site upper level:				
% by #	7.5%	0.9%	2.3%	89.3%
% by weight	54.7%	0.8%	1.2%	43.3%
Garratt site middle level:				
% by #	1.9%	0.6%	2.2%	95.1%
% by weight	31.0%	1.0%	5.1%	62.8%
Garratt site lower level:				
% by #	0	0	66.7%	33.3%
% by weight	0	0	100.0%	<0.1%

Table 10: Bone grease fragment type distribution for the Prairie/Plains Side-notched levels.

It is possible that the individual represented is also intrusive. However, there is not a prolific living population of rabbits at the site (none were spotted over the course of the two summers of investigations). Since rabbits contain considerably more edible meat than a gopher, and are occasionally mentioned in ethnographies as alternative meat sources (Denig 1961: 121), they are therefore more likely to have been used as a food by the prehistoric peoples at the Turn. Rabbits remains are therefore considered as representing a portion of the prehistoric subsistence strategy at the Turn.

Vulpes vulpes, or red fox is the second best represented species at the Turn, after Bison bison. However, more than half the identified fox elements probably came from a single individual. The numerical sample is high because it consists of the lower portion of two limbs, a portion of anatomy that is characterized by a lot of small bones. Since fox remains were found at two different excavation areas, it is likely that they represent an item in the prehistoric subsistence strategies at the Turn, either as food or for their pelts.

Canid remains were not particularly well represented numerically, consisting of only 0.1% of the assemblage. However, these remains are found all across the Turn and they are represented in at least one occupation level from each of the four excavation areas. The Canis sp. remains were compared to the University of Alberta comparative canid specimens and appeared to be similar in size to the wolf (Canis lupus). However, since the remains from the Turn were mostly post cranial, they cannot be definitely identified

as anything but Canis sp. It is possible that these remains may be present as a result of canids scavenging through the campsite refuse, and even possible that such events took place during periods when the Turn was temporarily abandoned by its human inhabitants. However, it is just as likely that the canids at the site were being exploited by the human population as a food item, for their pelts, or possibly as a domesticated animal.

Human remains were only recovered from one occupation level from one excavation area. Seven foot and rib elements were identified. Although it is possible that the excavation units nicked the corner of a burial, no intrusive burial pit could be seen in the stratigraphy, and the rib and foot elements are not the elements one would expect to find located together in an articulated burial. On the other hand, they are both the type of elements which might become lost or separated from the rest of the skeleton in a scaffold or defleshing treatment, and left behind when the rest of the remains were interred. This interpretation is speculative but does open up the possibility that the majority of the individual represented in the assemblage was buried elsewhere.

Next to the rodent materials, bison remains represent the majority of the mammal remains that could be identified as to genus and/or species. In fact, identified bison remains make up close to half the mass of mammal remains or the percentage by weight. In addition, it is likely that most of the bone fragments identified as medium or large mammal remains are actually bison bone. If this were true, 74.3% of the faunal assemblage by number and 94.5% by mass

could be attributed to bison. In any case, it is safe to assume that bison formed the mainstay of prehistoric subsistence at the Turn, as it seems to have done for most other Late Prehistoric period sites on the Saskatchewan Plains.

In order to determine activity patterns across the Turn area, the faunal assemblage from each of the occupation levels of the four excavation areas are examined separately below. Attention is given to the type of remains present, both in terms of species, age where attainable, and of elements. Apart from supplying general information on food sources, the age and species of individuals represented in the faunal sample are useful in interpreting seasonality. The type of bison element present (or absent) in the assemblage can provide information for the functional interpretation of each excavation area. For these purposes, I have relied upon Binford's utility indices for caribou elements provided in his Nunamuit Ethnoarchaeology (1978). These indices are based on the assumption that different portions of a carcass yield different amounts of meat, marrow and bone grease, and therefore have differing value to the hunter. Each element is taken to represent the meat, marrow and bone grease recovered from the associated limb or carcass portion. By calculating the relative amounts of meat, marrow and bone grease associated with each element, Binford has come up with a series of comparative nutritional or economic utility values for the various bone elements (1978: 23, 27 and 33).

Some caution is warranted here, since how such indices would correspond to the use of bison by Plains Indian groups is not known.

However, the animals have some general anatomical similarities, and examination of the ethnographic references to butchering units for bison among various Plains Indian groups (Harmon 1911: 287; Mandelbaum 1979: 58; Wissler 1910: 41-42) indicate similar butchering units and treatment to those documented by Binford for Nunamuit caribou butchering. Where relevant, I have included ethnographic references in the interpretation of faunal assemblage-related activity areas. It would have been preferable, of course, to have used a set of indices developed specifically for bison. However, such indices have not yet been formulated. In the meantime, Binford's utility indices for caribou has been used in interpreting a number of prehistoric bison assemblages. Binford himself reasoned that his caribou indices were "suitable for use on other ungulates, in the absence of appropriate studies of economic anatomy", and applied his caribou indices to two bison kill assemblages: the Glenrock Buffalo Jump site in Wyoming, and the Bonfire Shelter bone level 2 from Texas (1978: 475). In addition, both Speth (1983) and Brink (1986) used Binford's caribou indices in their analyses of the bison assemblages at the Garnsey Bison Kill in New Mexico and the Head-Smashed-In Buffalo Jump in Alberta, respectively. Both noted potential problems, but felt that in the absence of indices developed specifically for bison, the use of Binford's indices were worthwhile (Brink 1986: 200, Speth 1983: 88).

A second, more serious problem in the use of Binford's utility indices on the faunal sample from the Turn lies in the nature of the site, the excavations and the faunal assemblage recovered there. The

Turn is, at least in part, a campsite, whereas the sites mentioned above are kill sites or associated processing areas. This fact and the division of the excavations at the Turn into four discrete excavation areas, as well as the multiple components present has resulted in the recovery of 16 small faunal assemblages, none of which has a minimum number of bison greater than two. Brink and Speth were working with assemblages with MNI's of 24 and 35 respectively (Brink 1986: 204, Speth 1983: 53), and were able to chart the presence of various elements in the faunal assemblage against the expected presence of such elements based on the nutritional value of the associated meat, marrow and bone grease. This is undoubtedly the most valid situation in which to employ Binford's utility indices. However, the use of such a method on small assemblages with MNI's of one or two is not likely to produce valid or useful results. An alternative would be to lump the assemblages together but this would still produce a MNI of less than five, and would obscure any functional differences within the site and through time. Accordingly, Binford's indices are used here in a very subjective manner. The relative values of the bison elements present in each assemblage, as set out in Binford's meat, marrow and bone grease indices, are examined for indications of the type of activity represented by that particular assemblage. Any assumptions arising from such indications are admittedly speculative. However, in the absence of large scale excavations and a more 'statistically valid' faunal sample, a subjective examination of the faunal assemblage can provide some insight on the subsistence strategies of

the prehistoric occupants at the Turn, provided the problems of such a methodology are kept in mind.

The faunal assemblage of each cultural area is described in terms of the degree of bone fragmentation. This is outlined in Table 11.

Area A: Upper Cultural Level

The upper cultural occupation at Area A contained a light scattering of small bone fragments. A total of 2500 fragments, weighing 1075.5 grams was recovered. Very little of this, 0.5%, showed traces of burning.

The only identified non-mammalian remains are 6 fragments of a right humerus of a bird. The identified mammal remains for this occupation consist of bison, canids and rodents. Rodent remains make up the great majority of the assemblage numerically. In this level they constitute more than twice the average percentage for the site.

The canid remains represented in this level consists of two items: the distal and shaft portion of a left tibia and an unidentified carpal or tarsal.

The size grade distribution of the faunal remains demonstrates the comminuted nature of the remains for this level; the largest percentage of the assemblage falls into the smallest size category, 0-2 cm. This is the only occupation level in the entire Turn area excavations where the greatest mass of the faunal material falls into the smallest size grade. As previously mentioned, the frequent flooding and silt deposition at this site tends to retard post-

Size grade (cm)	0-2	2-5	5-10	>10	Whole
Area A upper level:					
% by #	97.1%	1.8%	0.6%	0.1%	0.3%
% by weight	43.8%	5.6%	21.1%	21.7%	7.9%
Area A middle level:					
% by #	85.0%	13.7%	0.8%	0.2%	0.3%
% by weight	21.7%	23.4%	18.4%	25.9%	10.6%
Area B upper level:					
% by #	85.0%	13.7%	0.8%	0.2%	0.3%
% by weight	21.7%	23.4%	18.4%	25.9%	10.6%
Area B middle level:					
% by #	81.7%	16.4%	1.2%	0.2%	0.5%
% by weight	18.0%	19.4%	15.6%	23.3%	23.8%
Area B lower level:					
% by #	87.1%	10.4%	0.6%	0.4%	1.4%
% by weight	14.3%	8.9%	10.2%	50.2%	16.4%
Area C upper level:					
% by #	60.8%	34.5%	3.6%	0.5%	0.6%
% by weight	13.6%	34.7%	29.3%	18.8%	3.6%
Area C lower level:					
% by #	51.2%	44.0%	3.8%	0.6%	0.5%
% by weight	11.5%	34.1%	28.1%	23.0%	3.4%
Garratt site upper level:					
% by #	74.7%	17.3%	6.2%	1.8%	0
% by weight	8.6%	13.6%	19.3%	58.5%	0
Garratt site middle level:					
% by #	93.1%	6.2%	0.5%	<0.1%	0.2%
% by weight	30.0%	40.5%	27.0%	2.4%	<0.1%
Garratt site lower level:					
% by #	25.0%	50.0%	0	25.0%	0
% by weight	<0.1%	6.5%	0	93.5%	0

Table 11: Bone fragment size grade distribution for the Prairie/Plains Side-notched assemblages.

depositional bone disintegration. This occupation level would therefore be a relatively good candidate for a marrow extraction and bone-grease manufacturing activity area. The identified bison elements are listed below. These consist exclusively of long bone

Bison elements recovered from Area A upper level:

right cuneiform	right radius - distal fragment
right lunate	right metacarpal - proximal fragment
right scaphoid	right tibia - distal epiphysis
right unciform	ulna - central shaft fragment
right magnum	metapodial - distal epiphysis fragment

fragments and carpals. The carpals are probably from a single (right) limb. The distal radius and the proximal metacarpal both rate relatively high in Binford's marrow utility index (1978: 27). The carpals and the ulna have little value in meat, marrow or bone grease extraction, but their presence in the assemblage may be due to their anatomical proximity to the distal radius and proximal metacarpal. All of the identified elements have low ratings on Binford's meat utility index (1978:21). This does not mean that meat was not extracted from this particular group of elements, but combined with the absence of the long bone shafts and the high marrow value of the elements present (or anatomical proximity to such elements), it is probable that marrow extraction was at least a subsidiary processing activity related to this assemblage.

The presence of bone-grease manufacturing at a campground is much more difficult to interpret, especially in terms of utility indices. Where this activity has taken place, those elements most valuable for bone grease cannot be expected to be present in

identifiable condition, since they would probably have been pulverized to facilitate grease extraction (Binford 1978: 158). Furthermore, my personal experience with soup-bone boiling indicates that the boiling process weakens the bone structure to the point where it would quickly disintegrate further once subject to whatever taphonomic processes did exist at the Turn. The elements with the highest bone-grease value are indeed not present in this occupation level in identifiable condition, but the absence of such elements cannot alone be considered an indication of bone-grease extraction, since the sample is small and probably consists only of select items which were imported from the kill. However, since the preferred type of bone grease, 'white grease', was manufactured from long bones, and such elements as mandibles, ribs and vertebrae produced a 'yellow grease' considered "not very desirable" (Binford 1978: 32; Zierhut 1967: 33-36), one could reasonably expect a relatively greater proportion of long bone fragments in a bone grease manufacturing activity area. As shown in Table 11, the representation of the relevant element categories for this level is not conclusive. The great majority of the bone fragments are unidentifiable even to these broader element categories. This could be expected from bone that has been pulverized and then structurally weakened by boiling. The comparative amounts of bone fragments producing white and yellow grease are equal in number but there is almost three times as much long bone (white grease producing) fragments in terms of mass. However, it is debatable as to what such proportions mean, since comparative figures for the proportion of the mass of a bison

skeleton composed of long bones as opposed to that portion composed of the axial skeleton and mandible are not available. The comminuted nature of the bone in this level combined with the absence of identifiable elements of high bone grease value do lend some credibility to the interpretation of a bone grease manufacturing area, but this must remain merely a hypothesis for the purposes of this study.

The upper cultural occupation level of Area A can be characterized as a processing area. Bone marrow was probably being extracted and bone grease extraction was possibly a related activity for the area.

Area A: Middle Cultural Level

The middle cultural level contained a bone bed of sorts, consisting of a dense scatter or a small midden of bone, some of which were relatively large elements. A total of 7458 faunal fragments and elements weighing 3781.6 grams were recovered from this level. Approximately 6.8% of these showed traces of burning or charring. The identified non-mammalian remains include bird, fish and mollusc remains.

Four bone fragments were identified as bird remains. Three of these were unidentifiable long bone shaft fragments and the fourth item is the distal portion of a right humerus.

Eighteen items were identified as fish remains. These include three vertebrae, several fin bones and scales.

Fifteen small fragments of mollusc shell were found. These were probably all from the same individual, since the fragments together

weighed less than one tenth of a gram.

The distribution of the mammal remains in the middle level is similar to that of the upper level, with the exception that three additional species, Homo sapiens, Vulpes vulpes and Lepus sp. are present.

The human remains referred to on page 128 were found in this cultural level. The elements recovered are listed below.

Human remains present in Area A middle level

distal pedal phalanx	left rib
metatarsal - left III	2 left rib fragments - vert. facet
metapodial	rib

One left astragalus identified as Vulpes vulpes was recovered. In addition, a left metacarpal - distal V, identified as Lepus sp. was also recovered.

There were 55 bison elements and fragments recovered from this level. The elements are too numerous to detail here, but they include left and right humerus and radius fragments, left ulna fragments, right tibia fragments, phalanges, right and left carpals, sesemoids, right metatarsal fragments and right tarsals, a horn core and several cranial fragments, two left mandible fragments and three teeth, and four axial skeleton element fragments. In summary, the majority of the right limb elements and a few left limb elements, with the long bones fragmented but still identifiable, part of the left mandible and a few cranial items, and a few axial skeletal elements were recovered. The long bone shafts in this sample are also present in identifiable condition, but are generally broken into

five or six fragments each.

With the exception of the metacarpal, all the elements with a high and even medium value on Binford's marrow utility index (1978: 27) are present. However, the interpretation of their presence here must be done with caution, since a number of other elements with very low bone marrow value (ie: the axial, cranial and mandibular elements) are also present. On the other hand, in spite of the sample size, the element with the highest value on Binford's meat utility index, the femur, is significantly absent here, as are the elements with the next four highest meat values, the sternum, the ribs, the pelvis and the thoracic vertebrae.

In this case, the bone grease utility index is useful, since the absence of elements with high bone grease value is more significant given the larger sample. In fact, the elements with the three highest bone-grease values, the distal femur, the proximal humerus and the proximal tibia, are absent in the sample. The absence of the proximal humerus and the proximal tibia are especially significant here, since the shaft portions of both elements are present.

The size grades of the elements present are relatively evenly distributed in terms of mass. The fragment distribution between white grease and yellow grease producing elements is relatively equal in terms of number, although the long bone fragments are once again greater in terms of mass.

The size of the bison assemblage, coupled with the type of element present, may indicate that the middle cultural level of Area A represents a primary butchering activity area and/or midden for a

single bison. The absence of elements related to choice meat cuts can be expected in such a situation, since such cuts would normally be removed to the camp area for consumption or processing. However, since those elements with the highest marrow value are present, marrow extraction was either taking place in situ, or not at all. The fragmented nature of the long bones present would favour the interpretation that marrow was indeed being extracted as a secondary activity (see Brink et al. 1985: 181). This is supported by the ethnographic literature which indicates that marrow extraction from long bones often took place during the butchering process (Binford 1978: 54; Ewers 1955: 149; Wissler 1910: 41). Finally, the absence of the articular ends of elements with high bone grease values, especially coupled with the presence of the shaft portions implies that some bone grease extraction was going on at the site. If this was a primary butchering area, it is quite likely that a processing activity such as bone grease extraction would take place elsewhere and the lack of a distinct concentration of bone fragments in the smallest size grade or in the white grease producing element categories would result.

Area A: Lower Cultural Level

The lower cultural level was a relatively sparse level in terms of faunal debris. It contained a very light scattering of bone, with a slight concentration of whole and larger fragments of bone in the vicinity of a light charcoal soil stain. A total of 63 bone fragments, weighing 418.9 grams was recovered. Only one bone, less than 1% of the mass of faunal remains, contained traces of burning

or charring.

The majority of the assemblage consisted of identifiable mammal remains. Only two non-mammal items were recovered, a fish vertebrae and an amphibian vertebra.

Apart from bison, the only other identified mammal species in this assemblage was rodent, and only three items, weighing 0.3 grams were recovered. These may, in fact, have fallen through from a higher level, since there are so few rodent remains at this level, and since there was no indication of rodent disturbance at this level noted in the soil profiles.

Bone fragments in the medium/large mammal category make up 70% of the mammal assemblage by number, but only 4.3% by weight. Given the absence of other identified mammal species in this level, it is safe to say that these are probably all bison remains rendered unidentifiable by their fragment size.

The identified bison remains were found in a localized scatter (all within a single 1 X 1 meter unit) and consisted of elements from a lower right limb, from the distal epiphysis of the tibia through the tarsal bones and a couple of sesemoids, and extending to the proximal epiphysis of the metatarsal. The majority of these were found together during excavation and they were probably deposited in an articulated or semi-articulated condition.

All these elements have low values in terms of meat and bone grease utility, but the distal tibia and the proximal metatarsal have the second and third highest values on Binford's marrow index (1978: 27). Given the fact that this butchering unit had been separated

from the phalanges (another set of low utility value elements), as well as the fact that the metatarsal and tibia are broken off close to the epiphysis, it is likely that the shafts of those two bones were smashed to remove the marrow, and that the articulated unit of tarsals and long bone epiphysis was then discarded. Since there are no other identifiable elements and relatively few bone fragments in this area, it is likely that the actual butchering and processing events took place elsewhere and the articulated unit was dragged to this area.

Area A: Deep Cultural Level

The deep level at Area A is similar to the level described above, but was even cleaner in terms of debris. A total of 15 elements and bone fragments was recovered, weighing 682.2 grams. No traces of burning or charring were present.

The entire faunal assemblage consisted of identifiable bison elements, 12 of these were whole elements and three were fragments between 5 to 10 cm in length. The elements present are listed below. Once again, we have an isolated set of related elements.

Bison elements recovered from Area A Deep level:

right magnum	right metacarpal - proximal epiphysial portion
right unciform	right metacarpal - proximal shaft portion
right scaphoid	metacarpal - distal epiphysial portion
right lunate	2nd or 5th metacarpal
right pisaform	two 2nd phalanges
two sesamoids	two 1st phalanges

All have very low meat utility index values and, with the exception of the distal metacarpal, low bone grease utility index values. The

metacarpal has a relative high marrow index value and, in fact, is the only bone in the assemblage to have been broken.

This assemblage probably represents a set of articulated elements which were discarded after the marrow was removed from the metacarpal. It is possible that the entire unit was removed from the butchering area, and the marrow was extracted in situ. However, since little in the way of small bone fragments were present, the marrow may have been removed in the butchering area, and the discarded unit may have been once again dragged away to the excavation location, the two ends still attached by sinew or skin.

Area B: Upper Cultural Level

The upper cultural level of Area B contained a light scattering of 1512 bone fragments, weighing 568.8 grams. Only 1.9% of the assemblage showed traces of burning.

The majority of the assemblage consisted of unidentifiable bone fragments. The only identified non-mammalian remains were four bird bone fragments. These were identified as the cranial process of the manubrium, two coracoid fragments and an ulna, all belonging to a non-water fowl.

The majority of the mammal assemblage could be identified only as being remains from a medium or large mammal. The identified mammal remains include bison, canids and rodents.

The canid remains consist of a single sesamoid. The identification of this element as Canis sp. is tentative.

The identified bison remains make up a relatively small portion of the assemblage. They consist of a distal metatarsal fragment and

a number of mandibular elements. The mandibular elements are too

Bison elements present in Area B Upper level:

mandibular fragment	metatarsal - distal portion
incisor fragment	
two unerupted molar/premolar fragments	

fragmented to determine the age of the individual represented. None of the elements present are valuable in terms of meat attached. The metatarsal has a medium bone grease utility value, but was obviously not used for bone-grease extraction since it is intact. The sample is much too small to make any interpretations on the basis of high bone-grease value elements which are absent. However, the distal metatarsal has the greatest value on the marrow utility index.

The largest portion of the assemblage falls into the 2-5 cm size grade. There are no fragments larger than 10 cm and the canid carpal is the only intact element in the assemblage.

Most of the assemblage that could not be identified as to element could not be identified as to white or yellow grease producing element categories either. Of those fragments that could be separated, the yellow grease producing fragments formed the greater number and mass.

Analysis of the remains from this level is not particularly revealing. Given the low utility of the identified elements, it appears to be the edges of a refuse scatter or possibly a butchering area.

Area B: Middle Cultural Level

The middle cultural level of Area B contained a moderate scatter

of small bone fragments, with some larger elements interspaced. A total of 1,985 bone fragments, weighing 1400.9 grams was recovered.

Numerically, almost three-quarters of the assemblage was unidentifiable. The only identified non-mammal remains consisted of nineteen bone fragments identified as bird: 18 long bone shaft fragments and one immature tarsometatarsus.

Rodent remains made up the greatest number of the mammal assemblage. Two canid elements were recovered, the proximal portion of an immature left radius and a first phalanx. Since the individual was immature, it is difficult to speculate whether it belonged to a wolf (Canis lupus) or a smaller species.

Twenty bison elements were identified. These can be summarized as the elements of an adult left hind limb from the distal end of the tibia to the proximal end of the metatarsal and an immature hind limb from the distal metatarsal to the third phalanx, as well as an ulna fragment, a rib and two right lower premolars. This is one of the few instances where a minimum number of individuals of greater than one can be assumed. Unfortunately, this assumption rests on the comparative maturity of the proximal metatarsal and associated elements. The lower elements are similar in size to a yearling, and the metatarsal and first phalanx epiphyses were unfused. The upper elements are approximately 10% larger than a two year-old specimen and all epiphyses were fused. In addition, visual inspection of the distal and proximal metatarsal fragments indicates that the two fragments could not have come from the same element; the distal metatarsal shaft is much more slender than the shaft of the proximal

metatarsal fragment, and the bone surface from the upper element is far more solid and dense.

As in much of Area A, the majority of the identified elements come from associated sets of elements with low meat utility values and relatively low bone grease value. Once again, the metatarsals have extremely high marrow utility value and both metatarsals have been broken, although the distal metatarsal retains approximately half the shaft. The other four elements are unrelated anatomically, one being axial, two mandibular and one from the front limb. Of these, only the rib rates high on Binford's meat utility index, and even so, there are ethnographic references to the occasional removal of the meat from the ribs during butchering and the subsequent discarding of the ribs at the butchering area (Wissler 1910: 42; Turney-High 1941:37).

The bone from this level is relatively equally distributed amongst the various size grades in terms of mass, but numerically concentrated in the smaller size grades. The distribution of the fragments that could not be identified as to specific element is numerically relatively even between white and yellow grease-producing elements, and heavily weighted to the category of fragments that could not be identified as either.

It is unlikely that this area served as a meat or bone grease processing area given the absence of elements with high meat utility and the fact that the distal metatarsal was left intact. The presence of the two sets of lower limb units would indicate either a butchering activity area or a refuse midden.

Area B: Lower Cultural Level

The lower cultural level contained a light scattering of bone, spotty in nature with the smaller bone fragments concentrated around the larger elements. A total of 783 bone fragments, weighing 667.9 grams was recovered. Only 0.6% of the assemblage showed traces of burning.

The identified non-mammalian remains consisted exclusively of forty-four bird bone fragments. These fragments represent a large part of the skeleton of a large bird. The elements include 12 vertebrae, 31 long bone fragments and one possible skull fragment. The long bone remains are highly fragmented.

The identified mammal remains for this level include bison, rabbit and the ever present rodents. The rabbit remains consist of a single immature proximal phalanx, judging from size, probably from a jackrabbit.

Bison remains make up the bulk of the mammal remains, and since there are no other identified medium or large mammal species in the assemblage, it can be assumed that remains identified as medium/large mammal remains are largely bison as well. Fourteen bison elements were identified for this level. These consisted of a lower

Bison elements recovered from Area B lower level:

metacarpal - distal epiphysis	left mandible, proximal fragment
metatarsal - distal epiphysis	thoracic vertebrae, centrum fragment
4 sesamoids	
2 first phalanges	
2 second phalanges	
2 third phalanges	

foot unit from either a front or hind limb, the distal epiphysis of

a metacarpal and a metatarsal, a mandibular fragment and an axial skeleton fragment. Apart from the thoracic vertebra fragment, all elements have a low meat index value. The distal metapodials both have moderate bone grease index values and high marrow index values.

The size grade distribution for this level is weighted towards the smallest size category numerically and towards the largest size category in terms of mass. Only minor amounts of the non-identified bone fragments could be separated into white and yellow grease-producing bone and that portion is relatively equally distributed between the two types of bone.

The relatively high percentage of larger and whole elements in terms of overall mass, coupled with the presence of elements that might normally be discarded during primary butchering tend to indicate that the excavation was located on the edge of a butchering area for this level. However, the presence of the bird and rabbit remains would be more consistent with a campsite refuse area. It is possible that the area served both functions; the butchering activity may have been carried out near a refuse area, or campsite refuse may have been dumped in an area already littered with butchering remains. The separation of the lower metapodial and associated phalanges from the upper metapodial and associated elements implies that marrow extraction was taking place. If bone grease extraction was also taking place, it was not being carried out extensively, since neither distal metapodial had been smashed.

Area C: Upper Cultural Level

The upper cultural level at Area C contained a dense scatter or

small midden of bone fragments interspersed with some whole elements and larger fragments. A total of 3717 items, weighing 3856.3 grams were recovered.

Once again, the majority of the assemblage consisted of unidentified bone fragments and mammal remains. The only non-mammal class in the assemblage is Aves. The bird remains in this assemblage consist of 24 unidentified long bone shaft fragments.

The mammal species represented in the assemblage are bison, fox and a minor amount of rodent. The fox specimens consisted of 21 elements from the left hind limb from the tarsals down to the third phalanges as well as the distal epiphysis of the right humerus, and two left metacarpals. These were probably all from the same individual.

The bison assemblage consisted of two right femur shaft fragments, four right and left tibia shaft fragments, a left astragalus, a right and left humerus shaft fragment, a left radius shaft fragment, a right and left ulna fragment, a first phalanx, four sesemoids, a hyoid, a thoracic spine, a rib, six teeth and two cranial fragments.

This assemblage bears a striking contrast to the previously described assemblages. The most obvious difference is the absence of long bone epiphyses; the remains of at least six long bones were identified from their shaft fragments, but the epiphyses were absent. The presence of the shafts themselves is somewhat unusual, in comparison to the earlier described assemblages, where long bones are often represented by their epiphyses alone. It should also be noted

that the shafts are in numerous fragments but large enough to facilitate identification. As previously mentioned, the absence of epiphysial ends of bones is often taken as an indication of bone grease manufacturing activities. This absence is especially significant since the shafts are present. In fact, the shafts of the elements with the three highest bone-grease values, the distal femur, the proximal humerus and the proximal tibia are present without their epiphyses. Furthermore, the elements with the eight highest bone grease values are absent, although anatomically adjacent elements are present. For example, the calcaneus, with the fourth highest bone grease value is absent, while the adjoining astragalus, which has the eleventh highest value, is present in the assemblage.

A second obvious contrast with previous assemblages is the lack of the complete lower limb units (tarsals/carpals, metapodials and phalanges). Every cultural level in areas A and B had at least one unit consisting of either phalanges and distal metapodial or carpals/tarsals and proximal metapodial, often accompanied by the distal epiphyses of the adjoining radius or tibia. This assemblage only contains a single tarsal, a single phalanx and four sesemoids; carpals or metapodials are not present.

This assemblage contains fragments from a femur, one other important element not encountered in any of the assemblages in Area A and B. Since the femur is the bone with the highest meat utility value it would be most likely to have been carried away from a kill site. Its presence would therefore suggest the location of a meat processing area or a campsite where the meat was actually being

consumed. Indeed, there are some indications of the presence of other favored meat units. The ribs and the thoracic vertebrae have the third and fifth highest meat utility values, and a rib and a thoracic vertebrae spine are present in the assemblage. These are both elements which tend to succumb to taphonomic processes relatively rapidly. They may have been better represented in the assemblage originally. Even more significant is the presence of a hyoid in the assemblage. This element would be most likely to be removed from the carcass in association with the tongue (Wheat 1972: 102). Binford (1978: 21) gives the mandible with tongue a moderate value on his meat utility indices for caribou. However, this may be one instance where there is some difference between Nunamuit use of caribou and Plains Indian use of bison. The ethnographic references consistently indicate that the tongue was saved during both heavy and light butchering (Boller 1959: 234; Harmon 1911: 287; Kidd 1986: 101; Wissler 1910: 41-42). The tongues were, in fact, considered a delicacy (Verbicky-Todd 1984:169, Kidd 1986: 105) and were often allotted to individuals of importance (Hind 1971: 346, Skinner 1914: 525, Denig 1930: 534) or saved for feasts (Quaife 1921: 186, Lowie 1909:11, Harmon 1911: 287). Since the tongue was obviously a choice cut of meat, the meat utility value of the hyoid (in terms of associated cuts of meat) can be taken as rivalling the femur when referring to the Plains Indian use of bison. Its presence is also an indication of a meat processing or campsite area. Finally, the lack of lower limb elements supports such an interpretation, if one follows the earlier assumption that these were normally being left at

the kill or primary butchering area after the marrow had been removed.

The assemblage fragment size distribution was weighted towards the middle size grades in terms of mass. The majority of the non-identified bone fragments could not be separated into white and yellow grease categories. Those that could be separated fell into a relatively even distribution numerically with the mass concentrated in the long bone category.

The presence of the bison femur and hyoid and the absence of the discard units of the lower leg indicate the presence of a meat processing area or a kitchen midden. An examination of the non-faunal assemblage supports such an interpretation, the presence of lithic debitage, ceramic sherds and an ash scatter all point towards a kitchen midden. The absence of articular ends can be taken to imply that bone grease manufacturing was also taking place. Finally the broken nature of the long bone shafts probably indicates that marrow extraction was also taking place.

Area C: Lower Cultural level

The lower cultural level in Area C contained a dense scatter of bone similar to that of the upper level. A total of 2317 faunal items weighing 2666.2 grams was recovered. A small portion of this, 4.1%, showed traces of burning.

The only non-mammal remains recovered from this level were seven mollusc shell fragments, probably from freshwater clam or Unio sp.

The majority of the mammal remains fall into the general category of medium or large mammal. Two canid remains were recovered

from this level, a right ascending ramus fragment and a terminal phalanx.

Thirteen fetal bison specimens were recovered from this level. This included five fragments from the pelvic girdle, a distal left femur, a left calcaneus, three 1st phalanges, a left scapula fragment, a first right rib and a right 2nd incisor. The fetal remains were relatively well developed; they were slightly smaller than a comparative specimen from a May kill but approximately 25% larger than a comparative specimen from a March kill. The presence of these remains is significant, since it indicates that at least one of the occupations was present at the site in the late spring.

The non-fetal bison remains include left and right tibia shaft fragments, a tibia distal epiphysis, two distal metapodial fragments, four ulna fragments, a metacarpal v, a right unciform, four sesemoids, two 2nd phalanges, two 3rd phalanx fragments, four left and right mandible fragments, two cranial fragments, four teeth, a left hyoid fragment, and three thoracic spines.

The functional interpretation of this level poses some difficulties. There are no strong indications of bone grease manufacturing; this level contains fewer long bone shafts than the one above, and several epiphyses are present. The distal tibia and the distal metapodials are not particularly valuable for attached meat or for bone grease, but have high marrow index values. The assemblage includes the elements from the previously described lower leg units that are often discarded at the kill site. It also contains a number of cranial elements, especially skull fragments,

with would not likely be transported from the kill site. However, the assemblage contains a number of thoracic vertebrae fragments, which rate relatively high on Binford's meat index (1978: 21). In addition, it contains the remains of two choice butchering units which would not likely have been left behind at a kill or primary butchering site: hyoid from the tongue and a number of bones from the fetus. The importance of the tongue as indicated in ethnographic references has already been discussed. The fetus was also considered a great delicacy, boiled (Boller 1959:236; Grinnel 1892: 205; McHugh 1972: 93) or basted (Wissler 1910: 24-25). The size grade distribution of the assemblage does not illuminate this problem.

The greatest number of faunal material not identified by element could also not be identified by general body area. However, the mass of this material was relatively equally distributed between long bone fragments and the unidentified category.

Since the faunal assemblage contains both elements that could indicate a kill location (crania, lower leg units) as well as elements that probably indicate a campsite location (hyoid, fetal material), it may have been a combination butchering and kitchen midden. The presence of ceramics and lithic debitage also imply campsite activities, and the presence of a hearth may indicate that the area was once used as a campsite or processing area. Further refuse may have been deposited subsequent to the abandonment of the location as an activity area. An animal killed near the camp could have been butchered in the vicinity of this midden or the butchering refuse may have been deposited from elsewhere. The presence of the

fetal bison elements indicates that this occupation also occurred in the spring.

Garratt Site Upper Cultural Level

The upper cultural level at the Garratt site contained a very light scattering of small bone fragments. A total of 225 bone fragments, weighing 400.3 grams was recovered. Approximately 9.35% of this showed traces of burning.

Non-mammal remains were not identified in this assemblage. Identified mammal remains made up 51.6% of the assemblage; the remainder of the assemblage was unidentifiable.

The faunal remains in this area were in much poorer condition than those at the Davies site. Few of the items could be identified as to species. A right and left pelvis were identified as Canis sp. and a distal metacarpal was identified as Bison bison. The metacarpal retained a large portion of the shaft, but the entire marrow cavity had been exposed by a spiral fracture, probably in a similar manner to that observed by Binford while watching a Nunamuit woman extracting marrow (1978: 54).

The size grade distribution also reflects the poorer condition of the faunal material from this area. Numerically, almost a quarter of the assemblage falls into the smallest size grade, although the greatest mass of the assemblage falls into the largest size grade. Whole elements were not recovered at all. The size and condition of the bone fragments made the identification of white and yellow grease producing bone fragment categories difficult; 89.3% of the assemblage could not be identified as belonging to either category.

The paucity and condition of the remains in this level makes functional interpretations difficult. However, a consideration of the non-faunal remains will shed some light on the situation. The presence of a relatively large frequency of lithic debitage and potsherds indicate a campsite activity. The faunal material probably reflects a scatter of meal refuse. The condition and size of the bone may be due to some type of boiling activity, or they may be due to taphonomic stresses such as greater soil acidity resulting from tree cover in this area, or to longer surface exposure resulting from a slightly higher elevation than the previously discussed areas.

Garratt Site Middle Cultural Level

The middle cultural level contained a moderate scatter of 2429 bone fragments weighing 479.4 grams. Burnt and charred bone made up 9.5% of the assemblage.

The identified faunal remains for this level were fish and mammal remains. The fish remains consisted of a single scale. Bison and rodent were the only identified mammals in this assemblage. The great majority of the mammal remains could only be identified as being from a medium or large mammal, but these are probably bison remains.

Only four bison elements were identified. These are all limb

Bison elements recovered from Garratt site middle level:

right ulna fragment	proximal 1st phalanx
right lateral malleolus	distal 1st phalanx

units, probably all from the right front limb. The two phalanx

fragments are probably from the same element.

Once again, the majority of the bone fragments fell into the smallest size grade. In terms of mass, the fragment distribution leaned slightly towards the 2-5 cm size grade. In any case, the great majority of the faunal assemblage was in small fragments. The majority of the non-identified bone fragments, 62.8% could not be sorted into white or yellow grease producing fragments. Most of those that could be sorted fell into the white grease producing category.

The sample from this level is quite small, especially in terms of identifiable specimens. This makes functional analysis difficult for this level. The identified elements number among those that could be expected to be found at a butchering area, but the sample is too small and inconsistent to make such an assumption safely. The number of small bone fragments and the greater percentage of white grease producing bone fragments might be taken as an indication of bone grease manufacture, but once again this is a risky guess unless accompanied by the presence or absence of certain identified bison elements. The non-faunal assemblage, including a large quantity of lithic debitage and tools, as well as a small hearth, indicates a campsite activity for this area. The faunal assemblage is not inconsistent with such a function.

Garratt Site Lower Cultural Level

This level contained only four bone fragments, weighing 246.3 grams. None of these was burned.

The assemblage consisted of a bison thoracic vertebrae body, two

bone fragments belonging to a medium or large mammal, and one unidentified bone fragment.

The fragments present fell into three size grades, 0-2 cm, 2-5 cm and greater than 10 cm. The majority of this small sample were yellow grease producing bone fragments; none of the unidentified bone fragments fell into the white grease producing category.

This assemblage, once again, is far too small to propose any functional interpretations. The non-faunal assemblage is also enigmatic, a single worked quartzite spall was present to indicate the existence of a cultural occupation. This area was probably the periphery of a butchering, processing or campsite activity area.

6.1.5 Plant Remains

A total of 48.2 grams of charcoal and 51 chokecherry seeds was recovered from the Prairie/Plains Side-notched levels. The distribution of these remains is outlined in Table 12.

In addition to the specimens listed in Table 12, a number of plant remains were recovered from a series of bulk soil samples taken from the upper, middle and lower cultural levels of Area A. These were retrieved and analyzed by Tom Shay of the University of Manitoba. The following species were recovered:

Genus/Species:	Common Name:
<u>Chenopodium</u>	goosefoot or pigweed
<u>Amaranthus</u>	amaranth
<u>Rumex maritimus</u>	dock
<u>Rubus</u>	raspberry
<u>Prunus sp.</u>	wild cherry or chokecherry
<u>Crataegus</u>	hawthorn

Genus/Species:	Common Name:
<u>Populus</u>	poplar
<u>Fraxinus</u>	ash
<u>Salix</u>	willow
<u>Amelanchier</u> or <u>Ayras</u>	juneberry or pear
<u>Acer</u>	maple
<u>Tilia</u>	basswood

Shay feels that the uncharred goosefoot, amaranth, dock and raspberry are probably intrusive, but the charred wild cherry and hawthorn are problematic. They could have come from either natural sources or human collection and use, as they are part of the present local flora, but were all also used by historic Plains groups. The presence of charring could be interpreted as evidence of human use, but such an interpretation is tentative, since seeds could have become charred as a result of a prairie fire, or by accidentally blowing or falling into a campfire.

Three quarters of the charcoal recovered was from ash and poplar and/or willow. These and the juneberry/pear and maple remains reflect the present vegetation. However, since a number of these were found in association with hearth features, they probably reflect human use of a tree cover quite similar to the present condition. Shay does note the unusual presence of a single piece of possible basswood from the middle cultural level at Area A. Basswood does not grow naturally west of Brandon, Manitoba (Scoggan 1978-79). He notes that basswood was used for household containers and utensils among native groups in eastern North America (Ericksen-Brown 1979). It is possible that such a vessel or utensil may have been imported to the site through trade or visiting groups from the eastern woodlands.

Area	Cultural Level	Charcoal	Plant Remains Charred Seeds	Uncharred Seeds
A	Upper	0	21	0
	Middle	3.0 g	0	0
	Lower	39.1 g	0	0
	Deep	0	0	0
B	Upper	<0.1 g	0	0
	Middle	0.4 g	0	0
	Lower	0.3 g	0	0
C	Upper	0.2 g	0	0
	Lower	0.3 g	0	3
Garratt	Upper	0.6 g	1	0
	Middle	4.3 g	7	19
	Lower	0	0	0

Table 12: Plant remains from the 1984/85 Prairie/Plains Side-notched levels at the Turn. Charcoal quantities are given in total grams, seed quantities are given in estimated number of seeds present.

6.1.6 Summary

A number of patterns can be seen from the described assemblages. The lithic assemblage is fairly typical of the time period with a concentration on and conservation of finer grained exotic lithics such as Knife River flint and chalcedony for shaped tools and points. Coarser local materials were utilized for cruder tools or expediency tools and were more likely to be discarded. Fused shale is a relatively important raw material and bipolar percussion appears to be the most common lithic reduction industry for that and other fine grained lithic materials. The lithic distribution is sparse in the open riverbank areas east of Grayson's Dam, but is considerably more dense in the treed areas to the west.

The excavations at the Turn were not extensive enough to recover a large ceramic assemblage. However, partial reconstruction was possible for one of the vessels and a number of other sherds recovered were sufficiently diagnostic to point to an affiliation with the Mortlach culture.

Plant remains recovered from fine-screening the cultural levels provided some additional information. Many of the plant resources available at the Turn today appear to have been present during the Prairie/Plains Side-notched period, and were probably used by the local occupants.

The faunal assemblage for this time period appears to be dominated by kill or primary butchering assemblages to the east (Areas A and B), and more camp-like assemblages to the west of Grayson's Dam (Area C and the Garratt site excavations). A common

recurrence in the eastern assemblages is the presence of complete or almost complete sets of lower limb elements. These are elements that might normally be expected to be left behind at a kill site or primary processing area. The functional interpretations of the 1984/85 assemblages are discussed further in Chapter 8.

In spite of the limited amount of excavation and the small sample, the patterns emerging from the Prairie/Plains Side-notched assemblages at the Turn can still provide some insight into the prehistoric use of the Turn area.

6.2 Avonlea Complex Assemblage

The Avonlea complex assemblage was retrieved in 1985 from three units excavated on a lower remnant portion of the riverbank at Area A. Avonlea horizons were not encountered in any of the other riverbank areas, probably because they are too deeply buried.

In spite of the limited excavation area related to this period, a substantial lithic, ceramic and faunal assemblage was recovered, and the two most substantial features encountered during the investigations were from the Avonlea units.

6.2.1 Features

Two features were encountered in the Avonlea occupations excavated in 1985, one from each of the middle and lower cultural levels. Both were relatively large, extending beyond the three excavated units, although those units did cover the major portion of both features. Since the entire cultural assemblage for the middle and lower Avonlea levels came from these features the artifacts

contained in the features will not be dealt with in the feature description. Cross sections of both features can be seen in Figure 12.

Feature One

Feature one was a large midden composed mostly of ash, charcoal and bone, although lithic tools and debitage, fire cracked rock and a single rimsherd were also recovered.

The midden deposit was lenticular, approximately 10 cm thick in the central portion, but dwindling to an ashy horizon one or two cm thick toward the limits of the excavated area. The thicker portion of the midden extended for approximately 1.5 meters north/south. The east/west extent is unknown, since a portion of the midden had eroded away from the cutbank, but it was likely not much larger than two meters. It is not known how far the narrower ashy horizon extended; it was less visible to the west, but the horizon was relatively strong towards the north and south in the western portion of the excavation.

The ash, charcoal and fire cracked rock did not appear to be arranged in any pattern, and no fire reddening was visible below the feature, although there were occasional patches of both unburned and fire-reddened earth within the feature. A large amount of bone was present; some of this showed traces of burning, but a substantial portion, especially the larger elements, was unburned.

This feature was far too thick and packed with artifacts to facilitate a single level record drawing. It was excavated in layers, and between two and five level drawings were taken per unit.

Figure 13 (page 65) shows the upper portion of the midden, as encountered in the northern unit (43s116w). A photo of the lower portion of the midden, from unit 44s116w can be seen in Figure 35, and a planview of the lower portion of the midden is shown in Figure 36. The structure of this feature, as well as the general nature of the artifacts within it, indicate an ash dump and midden, probably a kitchen midden.

Feature Two

Feature two consisted of a lenticular lens of pure ash, underlain by a substantial, bowl shaped, fire-reddened-earth stain. The top of the ash and the paleosol around the feature contained a large number of potsherds, plus some bone, lithics and fire cracked rock. Some charcoal was encountered along the edges of the ash. The ash lens was 12 cm thick in the centre, roughly circular and approximately one meter in diameter. The fire reddening beneath the ash extended approximately 25 cm below the paleosol. This feature was centered between unit 44s116w and 44s115w, and extended into the south wall of Unit 44s115w.

A few of the larger bison elements were unburnt, but a substantial portion of the faunal assemblage for this level showed evidence of having been subjected to prolonged, intense heat or burning. The bone surface was hazed (covered with small cracks) and the bone was grey or calcined throughout. Some of the tooth fragments were misshapen and had porous or bubbly portions. Figure 37 is a photo of the top of Feature two, taken from Unit 44s116w.



Figure 35: Feature One from the middle Avonlea cultural level. Taken from unit 44s116w. The eroded cutbank is towards the top of this photo.

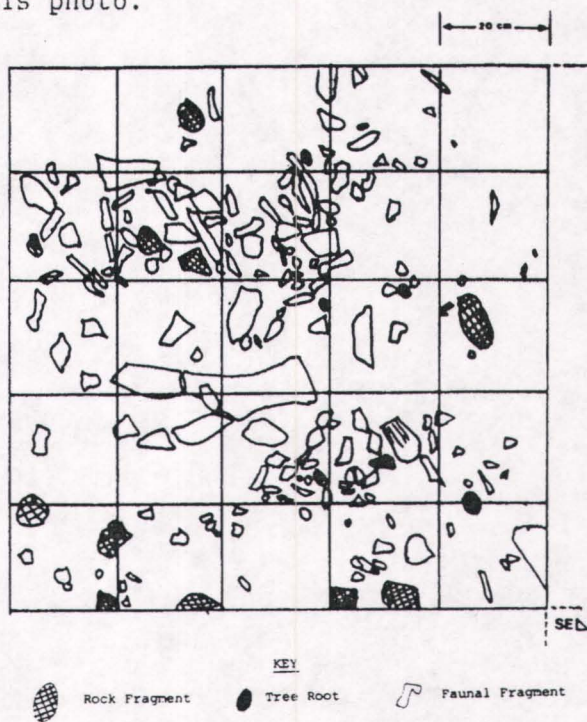


Figure 36: Planview of the lower limits of Feature One from the middle Avonlea cultural level. Taken from unit 44s115w.

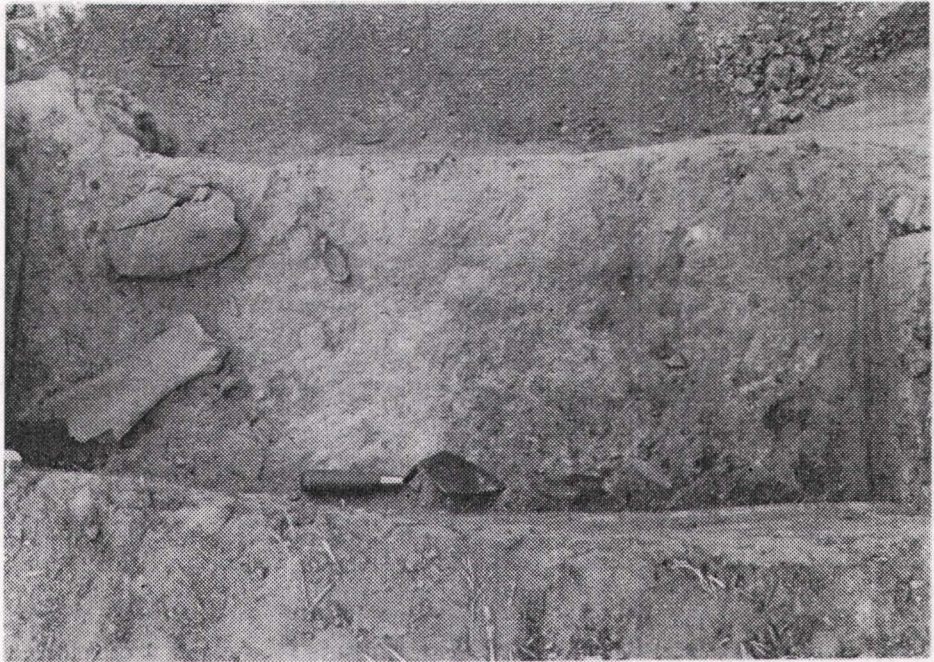


Figure 37: Feature Two from the lower Avonlea cultural level. Taken from unit 44s116w.

6.2.2 Lithics

A total of 759 lithic items was recovered from the Avonlea levels excavated at the Davies site in 1985. Of these, two were points, four were formed tools, three were marginally retouched tools or utilized flakes, four were cores and 746 were flakes and shatter. Since the Avonlea lithic assemblage is relatively small, the lithics from all three levels will be described together. Comparisons of the lithic assemblages from each of the three levels will be presented where deemed pertinent.

Raw Material

A variety of lithic raw materials was recovered from the Avonlea levels during the 1985 investigations.

The percentage of the various raw material types recovered is presented in bar graph form in Table 13. Once again, there is some discrepancy between the percentage by quantity and the percentage by weight of the various lithics, although not as pronounced as in the Prairie/Plains Side-notched levels. This probably reflects the low number of small retouch or shatter items in the assemblage as compared to tools, retouched flakes, cores and larger debitage items, in spite of the fine screening done on these units. This may be a function of the fact that the middle level, being a midden, probably contains only the larger items cleaned up from the original activity area, the smaller flakes being lost in situ. An investigation into the number of items per lithic gram is consistent with this interpretation, the upper Avonlea level ratio is 17.2 items per lithic gram, the middle level ratio is 3.3 and the lower level ratio

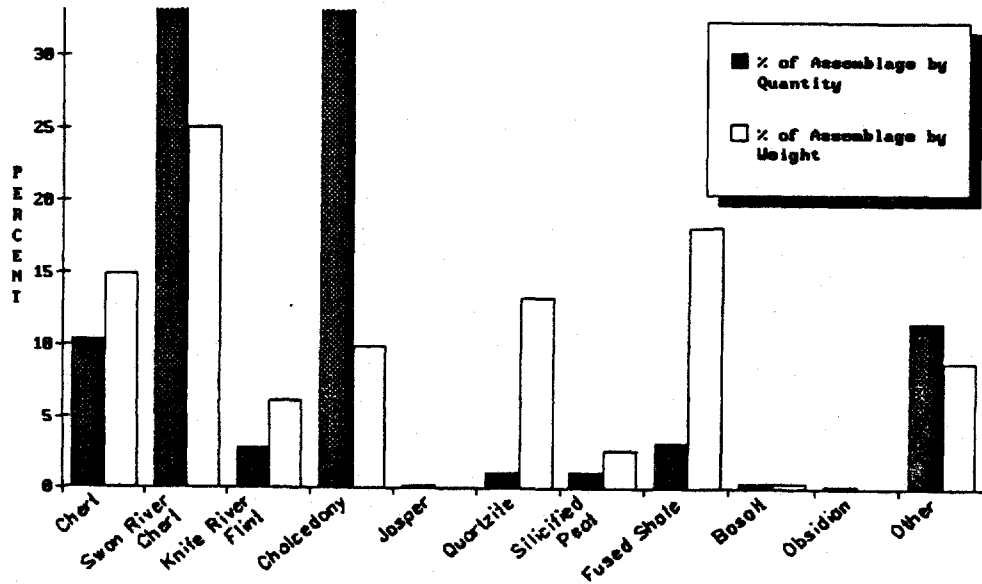


Table 13: Lithic raw material percentages for the Avonlea levels at the Davies site: Shaded bars represent % of assemblage by quantity, hollow bars represent % of assemblage by weight.

Avonlea Level		Chert	Swan River Chert	Knife River Flint	Chalcedony	Jasper	Quartzite	Silicified Peat	Fused Shale	Basalt	Obsidian	Other
Upper	% by No.	19.4	6.5	16.1	32.3	3.2	6.5	9.7	0	0	6.5	0
	% by Wt.	27.8	5.6	11.1	27.8	5.6	5.6	16.7	0	0	<1	0
Middle	% by No.	20.6	31.7	2.5	20.3	8.9	2.1	1.1	8.9	1.4	0	11.4
	% by Wt.	1.2	14.4	7.6	6.4	28.6	20.6	0.7	28.6	0.8	0	5.9
Lower	% by No.	3.4	34.3	2.2	42.7	0	0.2	0.7	0	0	0	12.8
	% by Wt.	14.3	25.2	3.7	16.0	0	0.4	5.9	0	0	0	13.6

Table 14: Distribution of lithic raw materials within the upper, Middle and lower Avonlea level assemblages by mass.

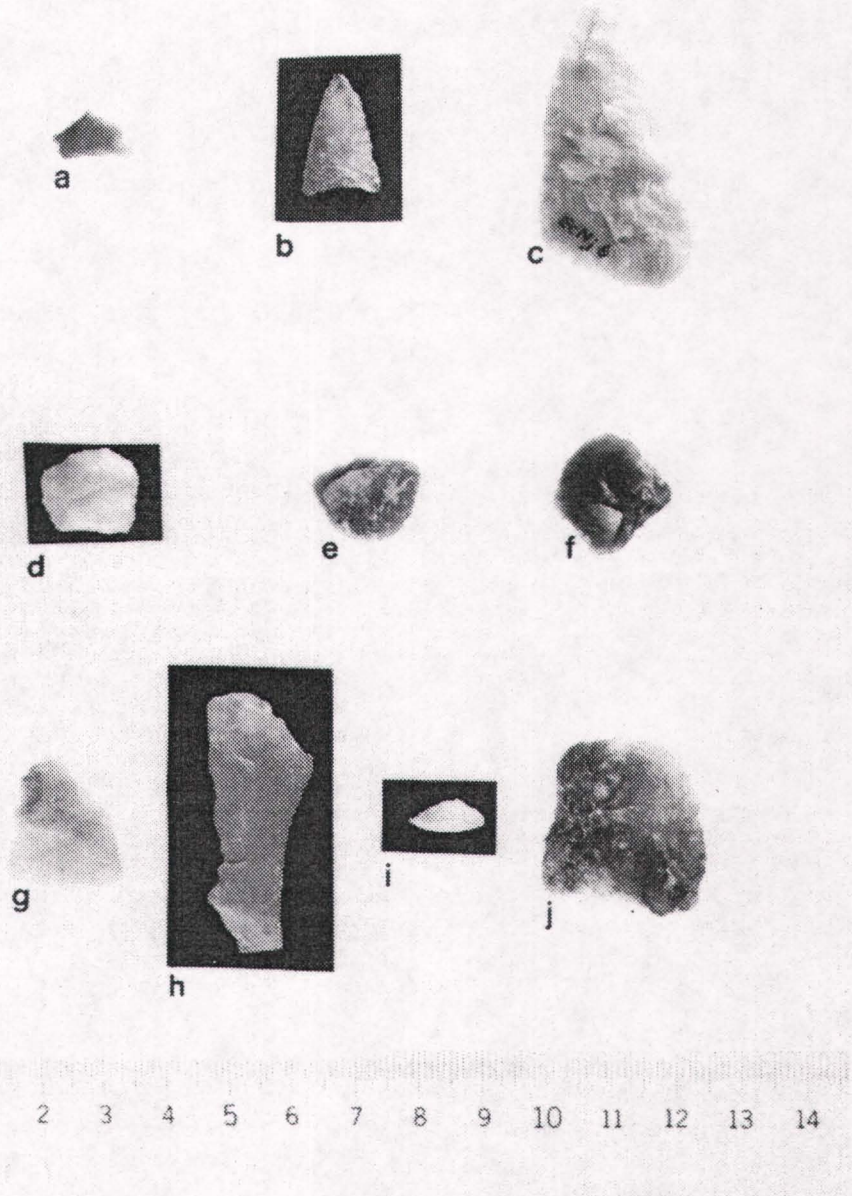


Figure 38: Lithic tools and retouched flakes from the Avonlea levels at the Davies site; a and b are points, c is a biface, d-f are endscrapers, f-i are marginally retouched flakes.

is 9.8 items per lithic gram.

Table 14 shows the comparative raw material distribution for each of the three Avonlea levels. Although the sample for the upper level is quite small, it appears that chalcedony and fused shale were the most commonly used materials, with Knife River flint and silicified peat also being important. The chert category has the greatest discrepancy between quantity and weight; a substantial number of small chert flakes was present.

Jasper and fused shale formed the greatest percentage of the middle level lithic assemblage in terms of weight, although high quantity to weight ratios of chalcedony and chert indicates the presence of a number of small flakes from those materials.

The lowest level has the largest number of lithic items. Swan River chert and non-identified lithics make up the largest portion of the assemblage by mass, although there were a large number of small chalcedony flakes present.

The distribution of the various lithic raw materials are outlined for each artifact class in Table 15. The sample of tools is relatively small for the Avonlea levels, but there are significant similarities between the Avonlea assemblage and the Prairie/Plains Side-notched assemblage. The two Avonlea points were made from chalcedony and chert and chalcedony was among the four most common materials for projectile points in the Prairie/Plains side-notched assemblages. Bifaces were not recovered from the excavated Avonlea assemblage, although a Swan River chert biface was collected in 1983 by ARMS from an eroded area of the middle cultural layer in the

Level	Artifact Class	No.	Chert	Swan River Chert	Knife River Flint	Chalcedony	Jasper	Quartzite	Sil. Peat	Fused Shale	Basalt	Obsidian	Other
Upper	Tools	1	100.0%	-	-	-	-	-	-	-	-	-	-
	MRF	0	-	-	-	-	-	-	-	-	-	-	-
	Cores	0	-	-	-	-	-	-	-	-	-	-	-
	Debitage	30	18.7%	6.6%	16.7%	33.3%	3.3%	6.6%	10.0%	-	-	6.6%	-
Middle	Tools	4	-	33.3%	66.7%	-	-	-	-	-	-	-	-
	MRF	2	-	50.0%	-	50.0%	-	-	-	-	-	-	-
	Cores	3	-	-	33.3%	-	-	-	-	33.3%	-	-	33.3%
	Debitage	273	31.9%	21.2%	1.5%	20.5%	-	2.2%	1.1%	8.8%	1.5%	-	11.4%
Lower	Tools	1	-	-	-	100.0%	-	-	-	-	-	-	-
	MRF	2	-	50.0%	-	-	-	-	-	-	-	-	50.0%
	Cores	1	100.0%	-	-	-	-	-	-	-	-	-	-
	Debitage	443	3.2%	37.9%	2.3%	42.7%	0.2%	-	0.7%	-	-	-	12.9%
Total	Tools	6	-	16.7%	33.3%	33.3%	-	-	-	16.7%	-	-	-
	MRF	4	-	50.0%	-	50.0%	-	-	-	-	-	-	-
	Cores	4	25.0%	-	25.0%	-	-	-	-	25.0%	-	-	-
	Debitage	746	10.3%	34.4%	2.6%	34.2%	0.3%	1.2%	1.2%	3.2%	6.5%	0.3%	11.8%

Table 15: Lithic raw material distribution by artifact class for the three Avonlea level assemblages. All figures are percentages calculated according to number of items in each class. MRF refer to marginally retouched flake.

cutbank. Swan River chert was the second most common material type for the Prairie/Plains Side-notched groups, after silicified peat. Two of the three unifaces were made from Knife River flint and the third one was of Swan River chert. Unifaces were also most commonly made from Knife River flint in the Prairie/Plains side-notched assemblage. Two of the Avonlea marginally retouched flakes (MRFs) were Swan River chert and the other two were chalcedony; there were no chalcedony MRF from the Prairie/Plains Side-notched assemblage. The four cores were of fused shale, Knife River flint, Swan River chert and an unidentified material; fused shale and Swan River chert were the most frequent raw material for the cores in the Prairie/Plains side-notched levels, but Knife River flint was not represented amongst the cores. Chalcedony and Swan River chert make up a significant majority of the raw material in the debitage category.

Although the sample is relatively small, especially in terms of the tools, there are a number of points worth noting here. Knife River flint, not surprisingly, is the most common material used for unifaces in both Avonlea and Prairie/Plains Side-notched levels; the unusual presence of a Knife River flint core in the Avonlea assemblage is significant. Swan River chert is a relatively popular material for tools and MRFs in both levels, as is chalcedony. There are no fused shale tools or retouched flakes in the Avonlea assemblage, although there is a core made of raw material very similar to those in the Prairie/Plains Side-notched levels. Quartzite and silicified peat tools are significantly absent in this

assemblage, although this may be a function of activity area, since both are represented amongst the flakes and shatter. Although the Avonlea assemblage is characterized by fewer crude tools made from materials that can be assumed to be local, there is otherwise a general continuity between the raw material utilization of both cultural complexes represented.

Projectile Points

Two points were recovered from the Avonlea levels excavated at the Davies site in 1985. Metric and other data for these points is presented in Table 16; photos of these artifacts are included in Figure 38.

One point of red chert was recovered from the Upper level (Figure 38a). The base of this point is concave, and has been ground. The notches are shallow, and the shoulder is significantly narrower than the base. The basal characteristics are relatively well executed. These characteristics conform generally to Kehoe's description of Avonlea style points (1983:51). However, the point is shorter than it is wide, and the tip has been resharpened to a relatively obtuse angle, giving it a stubby, blunt appearance. It is doubtful that this point could have functioned as a projectile point in such a condition; it may have been resharpened to function as a graver or some similar use.

A triangular point of mixed clear and light-brown chalcedony was recovered from the lower Avonlea level (Figure 38b). This point is similar in size to the grey chalcedony point recovered from the Prairie/Plains Side-notched level, but differs markedly in style.

Type	Raw Material	Length	Shoulder Width	Max. Thick	Basal Width/Height	Notch Width/Depth	Notch Grinding	Weight (grams)	Provenience
Resharpened Avonlea Point	chert	.92	1.18	.21	1.23 .23	.33 .10	some	.4	Upper
Triangular Point	chalcedony	1.91	-	.32	1.23 -	-	-	.5	Lower

Table 16: Projectile point data for the Avonlea assemblage at the Davies site. All measurements except weight are given in centimeters.

Tool Type	Classification		Metrics		Edges		Context	
	Shape	Raw Material	Length/Width	Max. Thick	# of Edges	Edge Angle	Cat. #	Provenience
Biface: knife	A	SRC	4.73 2.39	0.78	8.1	3 bi	50 4778	Middle c.l.
Uniface: endscraper	RT	SRC	1.50 1.58	0.5	1.3	3 uni	60 1696	Middle c.l.
Uniface: endscraper	RT	KRF	1.38 1.74	0.42	1.1	4 uni	60 1785	Middle c.l.
Uniface: endscraper	RS	KRF	1.61 1.63	0.61	1.8	4 uni	55 1888	Middle c.l.
MRF	blade	chalc.	4.07 1.79	0.51	3.1	1 uni	40 2370	Middle c.l.
MRF	flake	SRC	2.15 1.89	0.29	1	1 uni	55 1889	Middle c.l.
MRF	bipolar flake	chalc.	2.63 2.56	0.49	4	1 uni	50 2118	Lower c.l.
MRF	broken	SRC	—	0.22	0.1	2 uni	40 3366	Lower c.l.

Table 17: Non-projectile tool data for the Avonlea assemblage at the Davies site. All measurements except weight and edge angle given in centimeters. MRF = marginally retouched flake, SRC = Swan River chert and KRF = Knife River flint.

The Avonlea point is narrower, and the sides are only slightly convex. The base is obviously concave. The flaking is small and shallow, and both faces contain unretouched portions of the original flake blank. In spite of this, the point is quite symmetrical and has a fairly graceful appearance. Kehoe does not include triangular points in his typology, and none of the Avonlea bifaces he recovered from the Gull Lake site (1973: 104) resemble the point described above. The SMNH excavations retrieved a triangular point from the Avonlea horizon at the Garratt site, but it does not resemble the one retrieved from the 1985 investigations at the Davies site, being considerably wider with more convex sides and a less convex base. Triangular points, bifaces or preforms have been recovered from a number of Avonlea sites across the northwestern plains. Some of these resemble the rounder, blunter version found at the Garratt site, including points found at the Avonlea (Kehoe, et al 1988: 16, Fig. 10 b,c) Yellow Sky (Wilson-Meyer, et al 1984: 35, Figure 2b) and Lebret sites (Smith and Walker 1988: 85, Fig.5) in Saskatchewan; the Pas Reserve site (Joyes 1988: 232, Fig.11a) in Manitoba, the Fantasy site (Tratebas and Johnson 1988: 96, Fig 10) in Montana, and the Beehive site (Frison 1988: 162, Fig. 14, d-c, j) in Wyoming. However, a significant number resemble the thinner, concave based triangular points from the Davies site, including points from the Larson (Milne 1988: 57, Fig. 19) and Manyfingers (Quigg 1988a: 73, Fig 8-1, 2, 4 and 7) sites in Alberta, 24CB223 (Fredlund 1988: 174, Fig.2M) and the Fantasy site (Tratebas and Johnson 1988: 96, Fig. 10) in Montana, and the Beehive and Visborg sites in Wyoming (Frison

1988: 162, Fig. 14 f-i and 166, Fig. 19j, w, y). It should be noted that a number of the sites listed above contained both types of triangular points, as well as some intermediate styles.

The points described above resemble those found at other Avonlea sites. This is consistent with the carbon 14 dates of 1280 +/-110 B.P. (S-2785) and 1540 +/-210 B.P. (S-2786) from the Middle and Lower cultural levels recovered during the 1985 excavations at the Davies site.

Bifaces

A single Swan River chert biface was retrieved by ARMS in 1983 from the Middle Avonlea level at the Davies site (Figure 38c). This biface is roughly crescentic with an asymmetric convex base, and one convex side and one concave side. Flaking is irregular, broad and shallow, with a number of hinge fractures. Crescentic bifaces have been recovered in association with Avonlea assemblages at the Yellowsky site in Saskatchewan (Wilson-Meyer and Carlson 1984: 35, Fig 3e) and the Fantasy site in Montana (Tratebas and Johnson 1988: 97, Fig. 15). Metric and other data for this tool is provided in Table 17.

Unifaces

Three unifaces, all endscrapers, were recovered during the 1985 investigations from the Middle Avonlea level. Data for these artifacts is shown in Table 17. A dorsally finished endscraper is made from cream and white Swan River chert (Figure 38d). The proximal end of this artifact is broken off, but it appears to have been roughly triangular in both outline and cross section, with the

point of maximum thickness centered just above the working edge. A dorsally unfinished endscraper of Knife River flint was also recovered. This specimen appears to have been used and resharpened down to a small stub that was probably no longer functional. It is basically quadrilateral, although the edge opposite the working edge is convex. Flaking is limited to the edges of the artifact around an unflaked portion of patinated surface, probably from the original flake blank. The sides are more steeply flaked than the dorsally finished specimen. A final specimen from the same level can also be considered a dorsally unfinished form (Figure 38f). It has a relatively crude appearance; the surface is not flat and it appears to have been made from an exhausted core rather than a flake blank, leaving three major flake scars across the surface. However, it is roughly square in shape, and the actual tool retouch was performed only along the working edge and one other side. Unifaces similar to both types described above are found in Avonlea assemblages at the Garratt site (Morgan 1979: Plates 34-36) and elsewhere (Kehoe 1973: 92, Milne 1988: 57, Tratebas and Johnson 1988: 96-97).

Marginally Retouched Flakes

Four marginally retouched flakes are included in the 1985 Avonlea assemblage. All were retouched unifacially. Two of these come from the middle cultural level. One is a blade-like chalcedony flake, which has a slightly concave retouched edge along one side of the blade (Figure 38g). A second specimen, a thin, broad cream-colored Swan River chert flake has been worked along one side of the flake towards the edge opposite the striking platform (Figure 38h).

Two marginally retouched flakes were recovered from the lower Avonlea level. A chalcedony bipolar flake or core spall had been worked along one side (Figure 38i). A small retouched fragment of Swan River chert was also recovered from this level (Figure 38f). This item is quite small and is snapped off along one side with all other edges being worked; it may have been the tip of a uniface of some sort.

Cores

Four cores were recovered from the Avonlea levels at the Davies site, three from the middle level and a fourth from the lower level. The cores from the middle level are made from fused shale, Knife River flint and Swan River chert, and the core from the lower level is of unknown material. All four cores display characteristics of bipolar reduction similar to those described for the Prairie/Plains side notched levels. They are all quite similar in size, between 2.5 and 3 cm. All show traces of crushed platforms at opposite ends of the core, and the fused shale core and the core of unidentified material both have longitudinal negative flake scars on the face opposite the bulb of percussion. Morgan identified a number of similar specimens, which she calls 'pieces esquillees' in the Avonlea assemblage at the Garratt site (1979: plate 37). In his discussion of Avonlea point manufacturing strategies, Stanfill feels that "rounded materials were probably reduced following a bipolar technique or 'citrus core' reduction technique" but notes that "most assemblages lack data regarding this initial step of the reduction process" (1988: 252).

Flakes and Shatter

The debitage assemblage for the Avonlea levels consisted of 746 flakes and shatter weighing 166.2 grams. Of these, only 30 were recovered from the upper cultural level, 273 were recovered from the middle cultural level and 443 were recovered from the lowest cultural layer. It is interesting to note the high quantity of flakes from the lowest level especially in relation to a relatively low overall weight (39.1 grams) and relatively few items from other lithic classes (4). The middle level had a total of 273 flakes and shatter weighing 65.7 grams and 8 items from other lithic classes. This difference is probably a function of some in situ lithic reduction or retouch being performed in the vicinity of the hearth in the lower layer, producing numerous tiny flakes which might be missed in any clean-up operations. The middle level, on the other hand, appears to be a midden rather than an actual activity area, and would therefore be more likely to contain the larger, heavier lithic refuse that had been cleared away rather than the countless tiny flakes and shatter found in the lower level.

Summary

The lithic assemblage for the Avonlea levels at the Davies site is consistent with that recovered from the adjacent Garratt site by the SMNH, as well as Avonlea assemblages elsewhere on the northwestern plains. There is also some continuity in terms of raw material, non-projectile tools and in cores between the Avonlea assemblage and later Prairie/Plains side-notched assemblage at the Davies and Garratt sites. Finally the distribution and quantity of

lithics in the middle and lower cultural levels are somewhat reflective of the functionality of the features found in those levels.

6.2.3 Ceramics

Three potsherds weighing 24.4 grams were recovered from the middle Avonlea level, and 288 potsherds weighing 219.8 grams were excavated from the lower level at the Davies site. Ceramics were not recovered from the upper cultural level.

The ceramic assemblage from the middle Avonlea level is extremely small, but nevertheless relatively diagnostic. A single rimsherd, Vessel One was recovered from this level (Figure 39a). The surface is roughened by some sort of fabric impression, possibly net-impressed, but the sherd is otherwise undecorated. The lip is very slightly excurvate, with a squarish outline and it is not significantly thicker or thinner than the rest of the sherd. The lip has been smoothed, possibly by running a wet finger or object along the rim when the vessel was leather hard. This has resulted in a clean inner lip, with a slightly ragged overlap of clay that has been smoothed down over the fabric impression along the outer lip. The sherd appears quite well made, with fairly compact paste, but it contains a substantial amount of relatively crude temper; one grain is 3.5 mm in diameter, but the majority of the temper appears to be approximately 1 mm in diameter. The temper appears to be mostly feldspar or feldspathic granite with some mica schist. The sherd is 7.5 mm thick. There is very little curvature visible in this sherd.

One large bodysherd was retrieved from this level (Figure 39b).

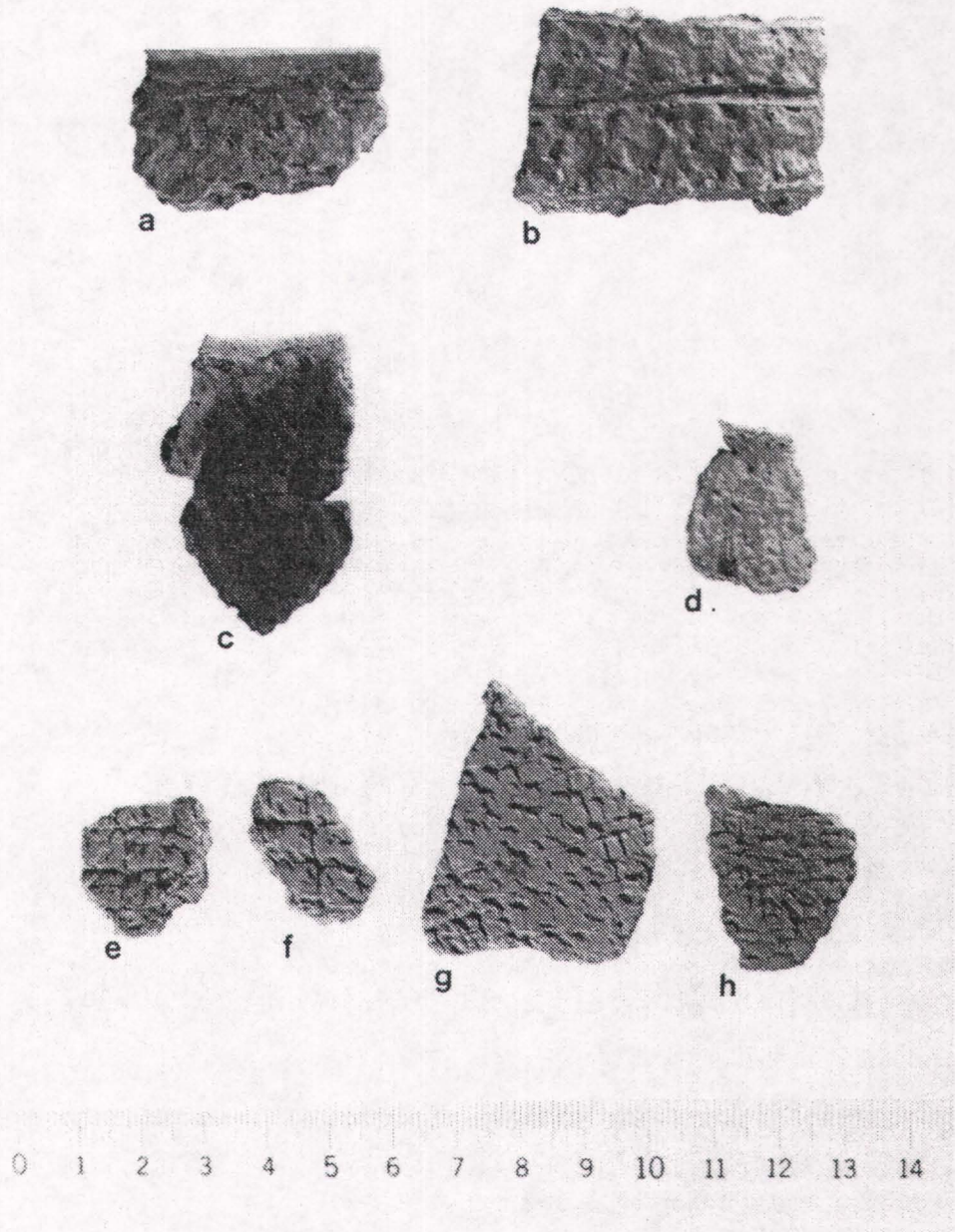


Figure 39: Ceramic assemblage from the Avonlea levels at the Davies site: a & b are from the middle cultural level and c-g are from the lower cultural level.

The surface finish is fabric impressed, and the sherd has three parallel incised lines. The incised lines are spaced approximately 1.3 cm apart, and are somewhat irregular. The paste is compact, and contains a substantial amount of fine temper with a diameter of less than 1 mm, probably of mica schist. There is virtually no curve at all to the sherd, although it spans almost five centimeters. Finally, there is a substantial amount of charred residue on the inner surface of the sherd. This sherd is tentatively considered as Vessel Two.

A third, small sherd was recovered from this level. Although this sherd has very little of its surface visible, there is some evidence of fabric impressions. There is little temper visible, what is present appears to be feldspar or feldspathic granite, with a diameter of 2.0 mm. It is charred on the inside as far as the centre of the sherd. The width of the sherd is 5.0 mm.

It is difficult to determine whether these three sherds come from the same vessel. Judging from the temper, the incised body sherd may be a separate vessel. In any case, the vessel (or vessels) represented has a relatively large diameter with little curvature.

Four rimsherds and 284 bodysherds were recovered from the lower Avonlea level. These are probably all from the same vessel, Vessel Three. Two of the rimsherds are extremely small, but the other two are fairly substantial. The surface on these sherds is roughened, but it is difficult to determine the exact nature of the surface finish from the rimsherds. The lip is fairly square, and appears to have been smoothed along the top, producing a ragged, unsmoothed

overlapping of clay along the outer edge of the rim. The two larger rimsherds both have angular punctates; one of the sherds has two of these punctates which were impressed at an upward angle (Figure 39c), and the other sherd has a single punctate which seems to have been impressed at a downward sloping angle (Figure 39d).

The large sample of bodysherds allow for a fairly good reconstruction of surface finish. This is definitely net impressed; the outlines of a loose net can be clearly seen on a number of the sherds (Figure 39 e - f). The strands are spaced at intervals of approximately 5 mm, and the impressions of knots are visible at the intersections of the gridlines. However, the clarity of the impressions varies considerably from one sherd to another; some sherds appear to have several superimposed net impressions, producing a cross-hatched effect (Figure 39g), and this is even less clear in other sherds, to the point where it degenerates to a stippled roughening (33h) .

The potsherds have obviously been subjected to varying degrees of heat after the vessel was broken. The original vessel seems to have been a dull grayish brown, but some sherds are charred quite black, others are an ashy grey, and still others seem to have been subjected to quite intense and prolonged heat, to the point where they turned a light orange-brown, similar to the colour of modern pottery which has been fired in a kiln.

The paste seems to be relatively compact, although there is some exfoliation or splitting between the inner and outer surfaces. The frequency of temper varies from moderate to quite dense. The temper

is coarse feldspar or feldspathic granite. Some of the temper particles are as large as 4.5 mm, although the average is closer to 2.5 mm.

The thickness of the rim and the average thickness of the bodysherds is 6.0 mm, although this varies from 4.0 mm some sherds to 8.0 mm in others. This is probably a function of sherd location on the vessel; one of the rimsherds varies from 5.0 mm near the lip to 8.0 mm at the opposite end of the sherd.

Curvature is very slight to imperceptible. The large rimsherd has a slight outward slope towards the lower end of the profile. From the sample present, the vessel appears to have been very large and simple in form, with fairly straight sides, no shoulders and a very slight constricting of the neck. The base of the vessel was either very slightly rounded, or is broken into very small fragments, or not represented in the sample.

Summary

Both levels from which the three vessels described above were retrieved can definitely be associated with the Avonlea culture, through radiocarbon dates, cultural diagnostics or stratigraphic principles. The three vessels described fit well with that assumption: they resemble vessels found elsewhere associated with Avonlea occupations. As mentioned in Chapter 1, a comprehensive, comparative description of Avonlea ceramic variation has yet to be written, and the purpose of Chapter 7 of this thesis is to partly remedy that situation. Consequently, discussion in this chapter will be limited to the attributes present in the three vessels described

above and a very brief mention of similarities in Avonlea vessels found elsewhere. This is merely to demonstrate that these vessels are consistent with the other artifacts found in the levels being discussed, and with the assumptions made regarding the cultural chronology and functionality of those levels.

The surface finishes on the three vessels are similar to those on the Avonlea vessels recovered by the SMNH from the Garratt site, which Morgan has interpreted as net-impressed (1979: 348). The clear knotted grid found on portions of the Davies site Vessel Three is not as clear on the Garratt site vessels, but it is still quite evident on portions of those vessels (Morgan 1979: Plate 44). Elsewhere, the net impression on the Garratt site vessels degenerates into the stippled effect described above for some of the Davies site Vessel Three sherds. Some of the Garratt site vessels have smoothed or worn portions that if found in isolation, could only be identified as fabric impressions; a similar effect is evident on the Davies site Vessel Two sherd. Vessel Four from the Avonlea level at the Crown site (Quigg 1986: 204) has several sherds which show a clear knotted grid which bears a striking resemblance to that on the Davies site Vessel Three sherds.

The smoothed lip, accompanied by a smoothed overlap of clay over the outer surface finish is also present in the Garratt site Avonlea vessels, as well as Avonlea vessels from other sites (Quigg 1986a: 202, Meyer et al 1988: 36).

The absence of lip decoration on the Davies site vessels is echoed in the Garratt site vessels. Similarly the use of incised

lines as a rim decoration is found in both the Davies site Vessel Two and the Garratt site Vessels One, Two and Ten, although incising is not a particularly common trait for Avonlea ceramics elsewhere. None of the Garratt site Avonlea vessels have true punctates, although the Garratt site Vessel Ten has a series of small, lightly impressed punctate-like marks descending in lines down from the incised lines, and Garratt site Vessels One and Two have what might be considered linear punctates: short, deeply incised lines impressed perpendicular to the vessel rim. The Davies site Vessel Three punctates do not appear to have been made with a round tool, and have been executed at a very slanted angle, but the overall effect is triangular rather than linear. Angular punctates are also present in Vessel One from the Avonlea level at the Lebret site (Smith and Walker 1988: 85) and the overall effect on that vessel is similar to that on Vessel Three at the Davies site.

The general vessel shape of a straight, uncomplicated, shoulderless profile is also present in the Garratt site Avonlea vessels. Curvature on the Garratt site vessels is also slight, although perhaps not as slight as indicated on the Davies site vessels. This profile is also frequently found in Avonlea vessels from other sites in Saskatchewan (Klimko 1985:78, Wilson-Meyer & Carlson 1984: 25).

In addition to the chronological indications discussed above, the ceramic assemblage may be reviewed in terms of functional implications for the levels in which they were found. The best represented vessel, Vessel Three, was retrieved from the lower

Avonlea level within and in the vicinity of a hearth. It is likely from this context that it represents an in-site breakage event, and therefore not surprising that a large portion of the vessel was retrieved. Vessel One and Two were retrieved from the middle Avonlea level, from what appears to be a midden. Such a feature could be considered to have less in situ context, and therefore be more likely to contain isolated items such as two or three sherds representing one or two vessels.

6.2.5 Faunal Assemblage

Only buried faunal remains associated with the three Avonlea levels are included in this analysis. A number of faunal remains had eroded out of the cutbank wall, and still more were pulled out of the profile walls by vandals, but these lack provenience, and were therefore either left at the site or collected for display purposes.

A total of 17,169 faunal items, weighing approximately 9.7 kilograms was recovered from the 1985 excavations of the Avonlea levels located at the lower Area A cutbank. Of this, 19.1% showed signs of burning or charring. Only three 1 x 1 units were excavated in this location, but a substantial amount of identifiable faunal material was recovered, especially from the middle Avonlea level.

The methodology followed in this section is similar to that described for the Prairie/Plains Side-notched levels. An overall summary of the Avonlea faunal assemblage is presented first, followed by a more detailed description of each of the three Avonlea level assemblages, accompanied by some functional interpretation.

The animal classes recovered from the Avonlea levels are outlined in Table 18. As in the Prairie/Plains Side-notched levels, the unidentified bones make up the numerical majority of the assemblage but the mammal remains make up the greater mass.

Four items were identified as bird bone. All of these were unidentifiable long bone shaft fragments. Twelve fish remains were recovered, all either scales or ribs.

Mammal species recovered from the Avonlea levels are listed in Table 19. Only two mammal species besides rodents were identified. In terms of both number and weight, the unidentified medium/large mammal class made up the largest portion of the assemblage, and bison a distant second. Canid and rodent remains composed only minor portions of the Avonlea faunal assemblage.

Bone grease fragment type distribution and bone fragment size grades are outlined in Tables 20 and 21 respectively.

Upper Avonlea Level

The upper Avonlea level contained a moderate scattering of 2709 bone fragments, weighing 416.3 grams. Evidence of heating or charring was found on 26.2% of the assemblage.

Mammal and fish remains were present, with mammal remains being far better represented. However, the majority of the assemblage numerically is unidentifiable.

Of the mammal remains, 95.4% of the mass could only be identified as medium or large mammal remains, while 3.8% was identified as bison with minor amounts identified as canid or rodent remains.

	unidentified	Mammalia	Aves	Pices
Upper Avonlea level:				
% by #	80.1%	19.8%	-	<0.1%
% by weight	29.5%	70.5%	-	<0.1%
Middle Avonlea level:				
% by #	73.5%	26.4%	<0.1%	0.1%
% by weight	14.0%	85.9%	0.1%	<0.1%
Lower Avonlea level:				
% by #	24.2%	75.8%	-	-
% by weight	70.5%	29.5%	-	-
Total:				
% by #	74.8%	25.1%	<0.1%	<0.1%
% by weight	16.5%	83.5%	<0.1%	<0.1%

Table 18: Faunal classes recovered from the Avonlea levels at the Davies site.

	Bison	Large Mammal-fetal	Canis	Rodent	Medium/Large Mammal
Upper Avonlea level:					
% by #	0.4%	-	0.6%	0.7%	98.3%
% by weight	3.8%	-	0.8%	<0.1%	95.4%
Middle Avonlea level:					
% by #	4.1%	0.2%	0.2%	0.2%	95.4%
% by weight	43.0%	0.1%	0.6%	<0.1%	56.2%
Lower Avonlea level:					
% by #	3.7%	-	0.3%	1.4%	88.6%
% by weight	39.1%	-	<0.1%	0.1%	60.8%
Total:					
% by #	3.7%	<0.1%	0.2%	0.4%	95.7%
% by weight	41.0%	<0.1%	0.6%	<0.1%	58.3%

Table 19: Mammal species recovered from the Avonlea levels at the Davies site.

	long bone	cancellous tissue	cranial/axial	unidentified
Upper Avonlea level:				
% by #	0.4%	0.3%	9.9%	89.3%
% by weight	2.1%	9.5%	22.5%	65.9%
Middle Avonlea level:				
% by #				
% by weight				
Lower Avonlea level:				
% by #	3.1%	1.7%	4.1%	91.1%
% by weight	19.7%	0.7%	6.85%	72.8%

Table 20: Bone grease fragment type distribution from the Avonlea levels.

Size grade (cms)	0-2	2-5	5-10	>10	whole
Upper Avonlea level:					
% by #	95.4%	4.3%	0.1%	0.1%	0.1%
% by weight	50.8%	36.0%	5.2%	7.8%	0.2%
Middle Avonlea level:					
% by #					
% by weight					
Lower Avonlea level:					
% by #	83.0%	15.5%	1.1%	<0.1%	0.5%
% by weight	28.8%	36.9%	13.7%	15.0%	5.6%

Table 21: Bone fragment size grades from the Avonlea levels.

Canid remains consisted of a right navicular, a phalanx and a sesamoid. Identifiable bison remains consisted of a single sesamoid and a proximal shaft fragment of a right tibia.

The majority of the assemblage falls into the smallest size grade, and there were very few larger fragments or whole elements present in this level. The unidentified bone fragments and those that could only be identified as medium or large mammal were separated into white and yellow grease producing element categories wherever possible. The resulting distribution indicates a higher percentage of yellow grease than white grease producing bone fragments. This is the opposite pattern one might expect if bone grease manufacturing was a major activity carried out nearby during that period of occupation. The size of the assemblage and the limited number of bison elements are inconclusive in terms of the functional interpretation of this level. This is partially a function of limited coverage, since the excavated area is only 2.5 square meters. However, a considerably greater mass of faunal material was retrieved from the other two levels in this excavation area. The upper level either represents an area of sporadic activity or the area was cleaned of refuse.

Middle Avonlea Level

The middle Avonlea level contained the largest, most dense deposit of faunal material found in all the areas excavated during the 1984/85 investigations. A total of 12,008 bone fragments, weighing almost 7.7 kilograms was recovered from this level. Burnt or charred bone made up 12.9% of the assemblage mass.

This is the only Avonlea level where bird remains were recovered. As previously mentioned, these were all unidentified long bone shaft fragments. The fish remains consisted of a single vertebra and a number of rib fragments and scales.

Mammal remains make up the greatest mass in the middle Avonlea level. The identified mammal remains from this level consist of bison, canid and rodent remains. A number of fetal remains were recovered, but they appeared to be in the earlier stages of gestation, and it was not possible to identify these as to species. They were from a relatively large mammal, however, and are probably fetal bison remains.

Five canid remains were recovered. These included the distal portion of a left tibia, the olecranon process of a right ulna, the distal portion of a left humerus, a left maxilla, and a vertebral epiphysis. The identification of the last item as canid is tentative, since it can only be based on size and gross morphological similarities. The canid portion of the assemblage is comparatively substantial in terms of the small area excavated, but probably represents a single individual.

The assemblage of identified bison elements is also quite large for this level. The elements recovered included a large number of long bone shaft fragments, especially from the right and left tibia, although the femur, humerus, radius and ulna were all represented by fragments from at least one side. An almost complete set of right tarsals, a right proximal metatarsal, a few carpals, several sesamoids and an almost complete set of phalanges were represented

for the lower leg elements. The axial skeleton was also well represented, including portions of the pelvic and the pectoral girdle, parts of the sacrum as well as numerous vertebra fragments, especially spinous and transverse processes. Numerous cranial elements were present, including portions of the right and left maxilla. Two right mandibles and a single left mandible were also recovered. The mandibles were examined by Dr. E. Walker of the University of Saskatchewan, in order to determine an estimate of the age of the individuals represented. Table 22 outlines Dr. Walker's analysis. Assessed age for the two mandibles is .4 and 6.4 years.

The bison assemblage appears to represent the majority of a single animal, plus a mandible and mandibular fragments from a second. In this case, the absence of a particular element is probably more illuminating than what is present. The hyoid is not present, in spite of the presence of the mandibles. Few ribs or rib fragments were present, although the vertebrae were particularly well represented. Metapodials were also comparatively poorly represented, as were carpals. Finally, the long bones were not intact, and were mostly represented by shaft fragments.

This assemblage probably represents an animal which was killed on or extremely close to the Turn, and probably quite close to the excavation area, since much of the elements that would normally be left behind at a kill are present. However, the fragmented nature of all the bone present except the smaller lower limb elements indicate a relatively extensive degree of processing. This is probably a processing or kitchen midden. The presence of elements normally

Specimen 2146: right mandibular segment

- i) dP2, dP3 and dP4 in place and all in wear
- ii) M1 has erupted above the alveolar margin but not to the level of the other teeth. Little or no wear is present on this occlusal surface.

Assessed age is .4 years.

Specimen 1991: right mandibular segment

- i) P2, P3, P4 and M1 all erupted and in full wear
- ii) M1 metaconid height 19.2 millimeters

Assessed age is 6.4 years.

Specimen 2327: right mandibular segment*

- i) M3 fully erupted and in full wear

No age assessed although animal is fully adult.

Specimen 1967: Left mandibular segment

- i) dP2, dP3 and dP4 in place and all in wear
- ii) M1 erupted above alveolar margin just about to level of deciduous dentition. Some slight wear on M1 protoconid.

Assessed age is .4 to .5 years (this may well be the other side of specimen # 2146.

Table 22: Age assessment of mandibles from the middle Avonlea level at the Davies site.

*This specimen fits specimen 1991.

associated with choice cuts of meat such as the sternum, pelvis and thoracic vertebrae are consistent with such an interpretation. The absence of a single element such as the hyoid could be a result of the sample size, but the absence of the ribs is more difficult to explain. They might have been incorporated in cuts of meat that were given away, or they may have been broken or boiled to the point that they were no longer identifiable once deposited into the archaeological context.

The nature of the feature which makes up most of this level is consistent with the interpretation of a processing and kitchen midden, since such a quantity of ash would not likely be found in a kill or butchering area.

The assessed age of the bison mandibles at .4 and 6.4 years indicate a late summer/early fall occupation, since bison are born in the spring. The large-mammal fetal remains are inconclusive as the species could not be positively identified, but they are suggestive of a late winter/early spring occupation. This is not necessarily a contradiction to the mandible evidence on seasonality, since the thickness and density of the midden in this level suggests an occupation over a considerable period of time.

Lower Avonlea Level

The lower Avonlea level contained a sparse scattering of bone around the hearth, especially larger unburnt elements, and a relatively dense quantity of highly burnt bone fragments within the hearth. A total of 2452 bone fragments weighing almost 1.6 kilograms was recovered from this level. Almost half the mass of bone

recovered, or 47.5% was burnt or charred. A substantial quantity of the burnt bone showed traces of having been subjected to intense heat, to the point where the bone surface was hazed (showed numerous small cracks) and the bone had turned a light grey or white.

The only identified animal class for this level was mammal, and this made up 70.5% of the assemblage by mass.

The majority of the mammal remains could only be identified as medium or large mammal. The mammal remains that could be identified included bison, canids and rodents. The canid remains consisted of two carpals.

The bison elements recovered from this level are listed below. The phalanx fragments were all burnt to the point where they

Bison elements recovered from the Lower Avonlea level:

distal metacarpal	2 sesamoids
first phalanx, proximal portion	right scapula
second phalanx	
4 third phalanges	
11 phalanx fragments	

had turned grey. Their fragmented nature may be due to having been thrown into the fire and thus subjected to intense heat. The scapula was relatively intact and not burnt; it was recovered adjacent to the hearth.

The scapula is associated with a relatively choice cut of meat, and its presence near a hearth is not surprising. The presence of the burnt phalanx fragments in the hearth is rather interesting. The phalanges have little meat attached, and they are not particularly valuable for bone grease or marrow extraction. They may have been

tossed into the fire after being disarticulated from the metapodials as a preliminary to marrow extraction from the metapodials. Binford notes that marrow was occasionally extracted from caribou metapodials by the Nunamuit while sitting around the fire (1978: 153).

The greater mass of the lower Avonlea level faunal assemblage fell into the smaller size grades. Once again, the majority of the assemblage could not be sorted into white grease or yellow grease producing fragments. Those bone fragments that could be sorted were slightly weighted toward the long bone category. However, in the absence of substantiating data from the identified bison element distribution, it is impossible to make any assumptions regarding the presence of a bone grease manufacturing activity related to this level.

The faunal assemblage for this level is not particularly informative regarding site functionality. However, it is not inconsistent with the presence of the hearth feature, which indicates a campsite activity area.

6.2.5 Plant Remains

A total of 142.8 grams of charcoal and two chokecherry seeds were recovered from the Avonlea levels at the Davies and Garratt site. The distribution of these remains is outlined in Table 23.

In addition to the specimens listed in Table 23, a number of species were identified by Tom Shay from soil samples. These are listed below. The plant remains from the Avonlea levels are similar to those from the Prairie/Plains Side-Notched levels, although a number of the species present in the later levels are absent in the

Level	Charcoal	Charred Seeds	Uncharred Seeds
Upper	16.1	-	2
Middle	124.1	-	-
Lower	2.6	-	-
Total	142.8	-	2

Table 23: Plant remains from the 1984/85 Avonlea levels at the Turn. Charcoal quantities are given in total grams, seed quantities are given in estimated number of seeds present.

Genus/Species	Common Name
<u>Chenopodium</u> (charred)	goosefoot or pigweed
<u>Populus</u>	poplar
<u>Salix</u>	willow
<u>Fraxinus</u>	ash
<u>Amelanchier</u> or <u>Pyrus</u>	juneberry or pear

Avonlea levels. This is probably a reflection of the fact that the Avonlea level assemblages were retrieved from a much smaller area in terms of total square meters excavated. The plant remains generally indicate that the flora of the Turn during the Avonlea period was similar to that of the present environment.

6.2.6 Summary

The excavation area for the Avonlea levels was small, but very productive. The presence of substantial features in the middle and lower level probably contributed to the intensity of the archaeological remains recovered. An average of 126.5 lithic items, 48.5 potsherds and 1.6 kilograms of bone per square meter per level was recovered.

The lithic assemblage contained two diagnostics, a resharpened Avonlea point and a triangular point, and seven other tools or utilized flakes. The tools and raw materials present were typical of Avonlea lithic assemblages found elsewhere in southern Saskatchewan, and also showed a considerable degree of continuity with the assemblage from the later Prairie/Plains Side-notched assemblage.

The ceramic assemblage for the Avonlea levels was also relatively consistent with a number of ceramic assemblages found

associated with Avonlea levels or sites elsewhere in Saskatchewan. However, this assemblage and the SMNH Garratt site Avonlea ceramics do display a trait that is relatively rare for Avonlea period ceramics; namely the presence of incised lines. This will be discussed in more detail in Chapter 7.

The faunal assemblage was especially substantial for these levels. There are no clear patterns in terms of types of elements present and on the value of such elements for the various food processing activities.

Any functional interpretations for the Avonlea levels are tentative, both because of the small area excavated and the problems with relating the faunal assemblage to a particular activity or function. Little can be said about the upper Avonlea level, beyond that it was either an area of low activity, or that it had been cleaned of debris by the occupants. The middle cultural level does not appear to be an in situ activity area, but was rather the location of a refuse dump or midden. The presence of a substantial amount of ash, the three ceramic sherds and bison elements associated with low value portions of the carcass indicate that the entire bison carcass was brought back to the campsite. This could be merely a matter of expediency, if the kill site was extremely close, or it could reflect a very economical and extensive use of the kill, right down to the head and the hooves. The mandibles indicate a late summer/early fall occupation, whereas the presence of large-mammal fetal remains suggests that the site was also occupied in the late winter/early spring. Combined with the density of the midden in

this level, this suggests an occupation that lasted through several seasons. The lower cultural level obviously represents a campsite activity area, given the presence of a large hearth and a substantial number of potsherds. The faunal assemblage is once again not particularly diagnostic of functionality, although it does present the interesting situation of the burnt phalanges within the hearth fill.

In summary, the Avonlea assemblage at the Davies site is reassuringly typical in terms of cultural chronology. In terms of functionality, it poses a number of interesting questions that could be pursued with further investigations at the Turn and other Avonlea period sites.

7.0 DISCUSSION OF PROBLEM ONE: CULTURAL CHRONOLOGY

This chapter discusses some of the information gained from the 1984/85 excavations at the Turn in the context of ceramic cultural chronology for the Besant and Avonlea periods. As previously mentioned, the later Prairie and Plains Side-notched period ceramic variation is considered too complex to deal with in the scope of this thesis, and as that problem is presently being examined by other researchers, it will be left in their hands. The 1984/85 investigations at the Turn recovered remains from only three Avonlea period vessels at the Davies site and did not encounter Besant period occupations at all. However, those investigations, coupled with a re-examination of the ceramics and stratigraphic information from the SMNH excavations at the Garratt site warrant some discussion on Besant and Avonlea period ceramics.

7.1 Besant Ceramics

The Besant complex on the Canadian Plains was originally considered to be aceramic (Byrne 1973: 499). The Garratt site investigations, in fact, were felt to be the first to have recovered ceramics in good association with the Besant complex. Since, then ceramics have been recovered from Besant assemblages at a number of sites, including the Walter Felt site (Kehoe 1964) and the Intake site (Dyck 1983: 120) in Saskatchewan and the Ross Glenn (Quigg 1986b) and EhPc-105 (Loveseth 1983) in Alberta. Unfortunately, the recoveries from the Saskatchewan sites have never been fully reported upon, and the context may be questionable. The ceramics from the

Ross Glenn site and EhPc-105 in Alberta were recovered in good context with Besant occupations. In fact, the Ross Glenn ceramics were actually recovered in a buried, single component area, within about 25 centimeters from a Besant point (Quigg 1986b). However, the potsherds from both of these sites were small and very weathered and therefore not particularly valuable diagnostically.

The ceramics in question at the Garratt site were retrieved from Level 8 of pit 6 CL (Morgan 1978: 219). Level 8 in this unit did not contain Besant points, and it was not radiocarbon dated. Besant affiliation was assigned on the basis of "the strong stratigraphic correlation between this pit and the main excavation unit" (Morgan 1978: 219). However, the unit with the 'Level 8' ceramics is located approximately 160 feet south of the main excavation units which would put it fairly close to the riverbank. Examination of the stratigraphic profiles for that unit as well as those for the main excavation block (Morgan 1978: 88-91) shows that 'level 8' is located between three to six inches below the Avonlea level at a depth of approximately three feet B.S. The unit with Besant diagnostics and radiocarbon dates in the main block is located over a foot below the Avonlea level, at a depth of approximately four feet B.S.

The 1984/85 excavations at the Turn revealed a great deal of inconsistency in the stratigraphy, with paleosols tending to split up towards the riverbank. Furthermore, the prehistoric levels tended to be more deeply buried toward the riverbank. These are both predictable situations given the lower elevation and more frequent

flooding of the riverbank area. When these results are considered, it is obvious that stratigraphic continuity should not be assumed in units at the Turn as far apart as the SMNH units were, especially if they are not both equidistant from the riverbank.

The 1984/85 investigations have shown that without further excavation the cultural affiliation of 'level 8' in unit 6CL cannot be proven to be Besant, especially not on the basis of stratigraphic correlation. Unfortunately, this probably faulty assumption has made its way into the published literature on Saskatchewan cultural chronology and it is often cited as a basis for the belief that Besant peoples on the Canadian Plains made and used ceramic vessels (Dyck 1983: 120). I personally have no doubt that some of the Besant peoples did use ceramics, but we need to find more and larger ceramic assemblages in good association with Besant period dates and projectile points before we make any further assumptions. It is especially important to consider the Garratt site stratigraphic context and perhaps that of the unreported Walter Felt site investigations, before we use ceramics from those sites as a typological basis for Besant period ceramic style.

7.2 Avonlea Ceramics

The Avonlea complex was originally considered to be aceramic. The Garratt site was the first site to confirm the association of ceramics with Avonlea occupations (Watson 1966). In this case, however, the association with Avonlea diagnostics and Avonlea period radiocarbon dates is good, and a large sample of relatively

diagnostic ceramics was recovered. The majority of these have a net impressed surface finish. Recent excavations at the Avonlea type site (Klimko 1985a) have recovered ceramic remains which have a very different surface finish, one made with a grooved or thong wrapped paddle. This section will examine these 'types' of Avonlea ceramics and attempt to give a general description of what Avonlea ceramics look like. Ideally, these defined styles could be considered diagnostic of the Avonlea culture.

The majority of the descriptive data used in this section was taken from published reports. All photos and profile drawings were examined for information not provided in their text, such as the presence of lip overlap or smoothing. I was also able to personally examine the ceramics from the Avonlea assemblages from the Garratt, Yellowsky, Crown and Lebret sites, in addition to the Davies site assemblage recovered during the 1984/85 investigations.

This description is generally limited to decoration, surface finish and shape of Avonlea vessels. Technological aspects such as paste, temper and construction are not examined. Table 24 summarizes a number of Avonlea ceramic assemblages on the Northwestern Plains. There are a number of surface collections from across Saskatchewan (and no doubt elsewhere on the Plains) that would be of relevance to this discussion. Of particular interest are Wayne Pendree's collections from the Kindersley area. He has a number of reconstructed and unreconstructed vessels from eroded surface sites that he feels are in good context. Some of the net impressed vessels represented have decorations such as linear punctates and

SITE & VESSEL #	LOCATION	C-14 DATE	SURFACE FINISH	DECORATION:		LIP	SHAPE	SIZE (CM)
				PUNCTURES	OTHER			
Davis (BSP)-6) Sask.								
Vessel 1		1280+/-110	textile impressed	-	-	smoothed	straight rim	large
Vessel 2		1280+/-110	textile impressed	-	horizontal incised lines	-	straight	large
Vessel 3		1540+/-210	net impressed	angular	-	overlap	straight rim	large
Garrett (BSP)-7) Sask. 1450+/-70 81280+/-60								
Vessel 1			net impressed	linear	-	overlap	globular	40
Vessel 2			net impressed	linear	horizontal incised lines	smoothed	-	38.08
Vessel 3			net impressed	-	-	overlap	-	-
Vessel 4			net impressed	-	-	smoothed	-	-
Vessel 5			net impressed	-	-	smoothed	-	-
Vessel 6			net impressed	-	-	smoothed	-	-
Vessel 7			net impressed	-	oblique cut lip impressions	overlap	-	-
Vessel 8			-	-	-	smoothed	-	-
Vessel 9			parallel grooved	-	-	-	-	-
Vessel 10			plain	vertical lines of punctures	horizontal incised lines	-	-	-
Avonlea (BSP)-1) Sask. 1565+/-205								
Vessel 1			parallel grooved	-	oblique cut lip impressions	-	conoidal	large
Vessel 2			parallel grooved	-	oblique cut lip impressions	-	-	9.86 (?)
Vessel 3			parallel grooved	-	-	-	conoidal truncated base	large
Leiset (BSP)-26) Sask. 1250+/-115								
Vessel 1			net impressed	angular	-	overlap	-	-
Vessel 2			heavily smoothed textile imposed	-	-	-	-	-
Sjovold (RINA)-4) Sask. 570+/-195 8575+/-195								
Vessel 1			parallel grooved	-	-	-	-	-
Crown (PINA)-66) Sask. 645+/-70 6785+/-115								
Vessel 1			smoothed	interior	-	smoothed	conical postulated	-
Vessel 2			net impressed	-	-	-	conical postulated	-
Vessel 3			net impressed	-	-	smoothed	-	small bowl
Vessel 4			net impressed	round	-	smoothed	-	-
Gravel Pit (PINA)-61) Sask. 345+/-145 815+/-135								
Vessel 1			smoothed	interior	-	smoothed	conical	30.55
Vessel 2			textile impressed	interior	-	-	-	-
Vessel 3			textile impressed	interior	-	smoothed	-	16.40
Vessel 4			net impressed	-	-	smoothed	-	-

Table 24: Avonlea ceramic attributes from selected sites across the Northwestern Plains.
Cwt = cord wrapped tool; * indicates a thermoluminescence date.

SITE & VESSEL #	LOCATION	C-14 DATE	SURFACE FINISH	DECORATION:		LIP	SHAPE	SIZE (cm)
				FINGERINGS	OTHER			
Gravel Pit (cont.)								
Vessel 5			smoothed	-	?	-	-	-
Vessel 6			rust	-	-	-	-	-
			impressed	-	-	-	-	-
Vessel 6a			-	-	cord impressed?	-	-	-
Vessel 7			rust	-	-	-	-	-
			impressed	-	-	-	-	-
Vessel 8			smoothed	-	-	-	-	-
Walliston Flat Snek. (FbM-112)								
		no diagnostics						
?			rust					
			impressed	angular	-	overlap rim	straight	-
?			smoothed	-	-	smoothed	-	-
Yellowy Snek. 420+/-135 (FJ04-2) 340+/-140								
Vessel 1			rust					
			impressed	-	-	smoothed	-	22.74
Vessel 2			rust					
			impressed	round	-	smoothed + overlap	-	-
Vessel 3			smoothed	-	-	smoothed	-	-
Vessel 4			rust					
			impressed	round	-	smoothed	-	-
Avery Montana mixed diagnostics								
			grooved paddle					
DIPC-4 Alberta ? grooved paddle large								
Larson(DIG-3) Alberta A.D. 530+/-150 785+/-125								
			smoothed	-	-	-	-	-
Manyfingers Alberta 1075+/-90 (DHPJ-31) 1100+/-85								
			knotted cord	tapered	-	-	-	-
Goheen Montana 1510+/-90 (24BC30) 1270+/-60 1080+/-90								
			grooved paddle	-	-	overlap	globular postulated	-
Fantasy Montana A.D. (24PH1324) 930+/-100								
			grooved paddle	-	-	-	-	-
Corey Ranch Montana 1080+/-80 (24TB3) *970+/-80								
			smoothed	-	oblique rim cut impression	-	-	-

Table 24: Continuation of Avonlea ceramic attributes from selected sites across the Northwestern Plains.

incised lines. A vessel from a surface collection at DkNf-1 by Byron Ebell is the most completely reconstructed net-impressed Avonlea vessel that I am aware of.

7.2.1 Avonlea Ceramic Attributes

The following discussion will first review the types of surface finishes associated with Avonlea ceramics. This attribute is generally used to divide Avonlea ceramic styles into two or three main types or 'wares', and such a methodology is also followed here. Subsequently, a number of other attributes will be discussed in relationship to the surface finish types.

Surface Finish

The most common type of surface finish in Avonlea ceramic assemblages from Saskatchewan is net-impressions. There is considerable variety in the clarity of the net impression, and this variation is found almost as much within a single vessel as it is between vessels and between sites. Certain sherds from some vessels display a very clear, open net impression complete with knots at the intersecting grids (see this thesis, Figure 39e; Quigg 1986a: Figure 7.22.1 to 4; Morgan 1979: Plate 44). However, this clarity is usually present in only a limited number of sherds on a limited area on any particular vessel. The impressions tend to overlap in places, giving a cross hatched effect, and in other areas they degenerate to a general stippled or pebbly effect. Some vessels vary from a sharp, unsmoothed impression in the upper portions to a smoothed, almost obliterated finish toward the lower portions and

base of the vessel, and other vessels such as the Yellowky vessels are fairly heavily smoothed throughout the assemblage, occasionally degenerating to an impression that can only be called 'textile impressed' (Meyer et al. 1988: 35). Although there are some cases where the impression appears to be doubled, as if resulting from an overlapping of the net being impressed on the vessel, there is little evidence of abrupt discontinuity in specific strand impressions or in the angle of the net orientation. In fact, the net impressions often seem continuously wrapped around large portions of the vessel (see Morgan 1979: Plates 45 & 46 for a striking example of this). This suggests that the net used to form the impressions was wrapped around the vessel rather than being wrapped around a paddle and applied in that manner (Morgan 1979;353). The distribution of net impressed Avonlea ceramics appears to be more northerly, from the woodland/parkland interface in the Nipawin area to the Qu'Appelle river system. The Garratt and Davies sites appear to be the most southerly sites with net impressed ceramics. I do not know of any reports of net-impressed ceramics associated with Avonlea assemblages south of the 49th parallel. Net impressed ceramics are occasionally found in Alberta (Byrne 1973, Quigg 1988a) and the Lebret site near Fort Qu'appelle (Smith and Walker 1988) appears to be the furthest east that net impressed Avonlea ceramics have been recovered to date.

The second most common surface finish found with Avonlea associated ceramics is the parallel grooved or grooved paddle finish. This surface finish is characterized by "equidistant lines and intervening troughs which encircle the vessel and cover the

entire exterior" (Johnson 1988:137). The orientation of the grooves varies according to the location on the vessel (Klimko 1985a: 53). Individual grooves are not continuous around the vessel, but rather "grooves extend in lengths of about 5 to 10 cm before each is truncated by an overlapping one at a slightly different angle (Johnson 1988:139). This type of impression is therefore thought to have been applied by paddling the vessel, either with the fingers (Johnson 1988: 138) or with a thong wrapped or grooved paddle (Johnson 1988: 138, Klimko 1985a: 53). Parallel grooved ceramics have a more southerly distribution than the net-impressed type. They have been found only in Saskatchewan at the Intake site (Dyck 1983: 123), the Avonlea site (Klimko 1985a: 53) and the Garratt site (Morgan 1979: 349). This type is also found in Montana (Johnson 1988: 139, Traetebas and Johnson 1988: 94), Alberta (Byrne 1973), Manitoba (Joyes 1988:231) and South Dakota (Neuman 1960).

A third variety of surface finish can be described as plain or smoothed. This finish is much less frequent, but has been found in assemblages from the Corey Ranch site in Montana (Quigg 1988b), the Larson site in Alberta (Milne 1988), the Garratt site in Saskatchewan (Morgan 1979) as well as a number of sites in the Nipawin area of Saskatchewan (Klimko 1985b, Quigg 1986a) and the Pas Reserve site in northern Manitoba (Meyer et al. 1988). In the more northerly sites, this smoothed surface finish is attributed to associations with Laurel. The Garratt site is the only site to date where net-impressed and parallel grooved ceramics have been recovered together in an assemblage but the smoothed surface finish is often found

together with net-impressed ceramics. The smoothed surface finish may, in fact, result from heavy smoothing of either of the other two surface finishes.

Decoration

Avonlea ceramic decoration is typically sparse or undecorated. This appears to be especially the case with respect to ceramics with a grooved paddle surface finish. The most common decorative attribute is a single row of punctates, often impressed at an upward angle, giving them an oblong or triangular appearance (Smith & Walker 1988:85; this thesis Figure 39c). Punctates are most often found on net impressed vessels, although a parallel grooved vessel with large punctates was recovered from site D1Pc-4 in Alberta (Byrne 1973). Interior punctates with exterior bosses are found on smoothed finish vessels from the Nipawin area (Klimko 1985b, Quigg 1986a). The Garratt site vessels have two particularly unusual punctate variations: linear punctates or short vertical incised lines on two net impressed vessels and vertical lines of small hollow object punctates on a smoothed vessel (Morgan 1979).

Lip decoration is rare, although oblique cord-wrapped-tool impressions are found across the lip on two parallel grooved Avonlea site vessels (Klimko 1985a) and a smoothed Garratt site vessel (Morgan 1979), and on the outer edge of the lip on a smoothed vessel from the Corey Ranch site (Quigg 1988b).

Finally, horizontal incised lines have been found on Avonlea ceramics only at the Turn. A net impressed vessel with three horizontal incised lines was recovered from the Davies site (this

thesis, figure 39b), and a net impressed vessel with two horizontal incised lines and a smoothed vessel with five horizontal incised lines were recovered from the Garratt site (Morgan 1979).

Shape and Size

Avonlea vessels tend to be quite simple in shape. They range from conoidal to globular. Quigg (1988b: 151) postulates an association between shape, size and surface finish, with the net impressed vessels being globular, slightly constricted towards the rim and smaller, and parallel grooved ceramics being conoidal, straight sided and extremely large. However, he appears to have greatly exaggerated the difference between net impressed and parallel grooved ceramic shape and size and based his ideas on a very small sample of reconstructed vessels. A reconstructed net-impressed vessel from DkNf-1 has a conoidal shape very similar to that of the parallel grooved ceramics from the Avonlea type site (Klimko 1985a) and is similar in size. Although one of the Garratt site net impressed vessels is definitely globular, the shape of the others is generally indeterminate. The Davies site vessels were not reconstructed to a point where vessel shape or size were attainable, but they are all extremely flat, with little or no curvature visible, implying a very large, straight sided vessel. It is therefore more likely that Avonlea vessels range in size and shape independently of surface finish. Shape ranges from globular with a slightly constricted upper body to conoidal with a straight upper body. Size ranges from a small bowl like vessel found at the Crown Site (Quigg 1986a) to the extremely large vessels found at the Avonlea type site

(Klimko 1985a). It is more likely that both shape and size variations are related to the vessel function rather than any abstract stylistic trend.

A very common attribute of Avonlea period ceramics, and especially of net impressed vessels is a smoothed lip, accompanied by either a ragged overlap of excess clay on the outer edge of the lip, or a smoothed outer surface. Both varieties are modified after the surface finish has been impressed, thus covering or obliterating the surface finish along the upper rim. Some vessels vary back and forth from a jagged overlap to a smoothed outer lip.

7.2.2 Summary

Avonlea ceramics can be characterized by a number of features. These are summarized as follows:

1. Three types of surface finish: net-impressed, grooved paddle, and a low frequency of smoothed or plain surface;
2. A low frequency of decorative attributes. The most frequent decorative attribute is punctates, which vary from angular to round to linear and include interior punctates with exterior bosses. Occasional oblique cord wrapped tool lip impressions also occur in association with grooved paddle and plain surfaces. Horizontal incised lines occur occasionally in association with net impressed ceramics;
3. Extremely simple shape, varying from globular with a slightly incurvate upper body to conoidal with a straight upper body; and
4. A smoothed lip, with a ragged overlap or a smoothed outer lip,

overlapping or obliterating the surface finish on the upper rim.

Further investigations at Avonlea period sites and an examination of surface collection assemblages may expand this repertoire of Avonlea ceramic attributes, but it may also show that some of the decorative attributes listed here are isolated abnormalities.

8.0 DISCUSSION OF PROBLEM TWO: LIFEWAYS

The 1984/85 investigations at the Turn have provided a data base for a number of assumptions regarding seasonality, site functionality, and resource utilization for the Prairie/Plains Side-notched and Avonlea periods. Although specific to the Turn area, these ideas bear upon some of the current assumptions regarding lifeways on the Northwestern Plains during the Late Prehistoric period.

8.1 Seasonality

The strongest indication of seasonality for the prehistoric occupations at the Turn lies in the presence of fetal bison remains in the faunal assemblage. Fetal remains were also recovered in Prairie/Plains Side-notched levels excavated by the SMNH (Morgan 1979: 96). This indicates a spring occupation for a number of the levels at the Davies and Garratt sites. However, three mandibles recovered from one of the Avonlea levels indicate a fall occupation for that level, and the presence of large mammal fetal remains in the same level implies that that level was also occupied in the spring. In addition, a number of other less obvious seasonal indications should be examined. The presence of chokecherry seeds, especially charred seeds, suggests that the Turn may have also been occupied in the fall. The frequent presence of bird remains, especially waterfowl, in the assemblages may be suggestive of an expanded season

of occupation, since these animals were most easily hunted during molting season in midsummer (Mandelbaum 1979:9-70).

The presence of ceramics at the Turn also has some bearing upon seasonality. The building of ceramic vessels is a warm weather activity, since it requires long periods of dry, warm weather to dry the vessel before firing, and relatively warm weather to allow the fire to become hot enough to fire the vessel. It is possible that some of the Prairie/Plains Side-notched vessels were made elsewhere and imported to the Turn, but the Avonlea period vessels were probably too large to have been easily transportable for any distance.

It is likely that any group occupying the Turn in the spring probably spent the winter there. The area provides an ideal wintering spot, sheltered with plenty of wood and water, and a good population of game, undoubtedly occupying the valley for similar reasons. In addition, the presence of chokecherries could provide a drawing card in the fall, molting wildfowl could do the same in the late spring, and the presence of good clay sources for the ceramic industry could encourage a summer occupation.

It is proposed here that the occupations at the Turn were probably mostly relatively long term winter occupations, possibly extending from early fall to spring. Furthermore, the possibility that the site was occasionally occupied during the late spring or even during the summer should not be discounted. Ethnographic references refer to the hunting of waterfowl during molting season (Mandelbaum 1979: 69-70) which occurs in midsummer, the

harvesting of prairie turnips which Hind observes occurring in mid-July (1971: 319) and the harvesting of berries from August to September or October (Ewers 1958: 86, 90). All these resources can be assumed to have been present at the Turn. They have either shown up in the archaeological record, or are referred to in ethnographic references specific to the Turn. The archaeological assemblage certainly supports the notion of a relatively long-term and/or intensive occupation of the Turn. Buried cultural occupations show up wherever soil profiles are exposed along the riverbank, and a relatively intense surface scatter is evident wherever cultivation, roads or other development has disturbed the vegetation cover across the Turn.

Grace Morgan supports the idea of a high degree of permanency in winter camp locations (1979: 182). However, she stresses the dependence of the human seasonal round upon the migration patterns of the bison, and the regularity of bison migration to the summer ranges (1979: 176), and supports her interpretations with ethnographic references. On the other hand, it has also been argued that the ethnographic data supports non migratory behaviour among bison, with their presence in all three grassland zones throughout the year (Hanson 1984: 99). Henry Epp has suggested a solution to this debate with his proposal of a dual dispersion strategy, proposing that part of the bison population migrated to grasslands seasonally, while others remained sedentary in wooded ecosystems (Epp 1988). The Turn provides such an ecosystem, and given Epp's hypothesis, there is no reason to suppose that bison were not available in the Moose Jaw

River Valley year round. Coupled with the other animal and plant resources present at the Turn, this hardly supports Morgan's notion of a "sudden scarcity of essential food resources in proximity to winter camp areas" in the late spring (Morgan 1979:175). This is not to say that the prehistoric occupants of the Turn did not necessarily participate in summer communal hunts on the grasslands. It is unlikely, however, that the 'human annual cycle' was particularly regulated so that one could safely predict "major human movements from the site area to the summer range...initiated some time after the first week in May" (Morgan 1979: 176) or a necessarily "high degree of mobility during the spring and early summer months" (Morgan 1979: 189). Furthermore, participation in the summer hunt did not necessitate the evacuation of the entire human population from the winter campground. Ethnographic studies of hunter-gather groups show that group affiliation was usually flexible and movements highly variable. It is not unusual for one or more individuals or families to leave the group they are living with and join another if resources become scarce or if the other group appears to be headed for 'greener pastures'. More significantly, it is not unusual for small temporary hunting parties to assemble to pursue game, leaving behind the less mobile portions of the group (although the distance such hunting parties could travel from the main group is limited by the availability of dogs or horses for transportation of the kill). It is therefore tempting to extend Epp's dual dispersion strategy hypothesis to prehistoric human movements. However, whether the prehistoric occupants of the Turn left the area for long periods to

follow the bison to their summer range, or whether they stayed to take advantage of the valley's summer resources and participated in briefer hunting forays to the surrounding prairie or to the south, can only be a matter of speculation at present. Further paleobotanical investigations at the Turn, as well as the location of the killsite, with a large population of mandibles to facilitate a population age profile, would be required to resolve the question. In any case, it cannot be assumed that the Turn was not periodically occupied during the late spring or summer.

8.2 Site Function

The faunal assemblage from the 1984/85 investigations has proven particularly useful in interpreting site functionality. The most common pattern in the various faunal assemblages across the site is the presence of the lower leg elements. These consist of two units, the distal epiphysis of the metapodial plus the phalanges, and the proximal epiphysis of the metapodial plus the carpals or tarsals, occasionally accompanied by the distal epiphysis of the radius or tibia. These units were found complete or almost complete and were probably deposited articulated. The metapodial, on the other hand, is always broken. One or both of these lower leg units is found in six of the 12 level assemblages and portions thereof in four of the remaining assemblages. As previously mentioned, the lower leg has little meat value, but the metapodials are favored in marrow extraction. Binford actually describes the units in his discussion of marrow extraction by Nunamuit in the field (1978: 153):

This method of breakage results in articulated feet-phalanges only and an articulated proximal metapodial and tarsals or carpals with occasionally the distal radio-cubitus or tibia also attached".

It is proposed that the two lower leg units described above can be considered a butchering unit. The frequent presence of all of the elements from such a unit in the assemblage can be credited to the fact that they are normally discarded after the marrow has been removed, often in an articulated condition.

The presence of these lower leg units in an assemblage has some significance for the functional interpretation of the assemblage. In ethnographic references to bison butchering, the lower legs are seldom mentioned as being amongst the butchering units taken back to camp, but there are some references to the marrow of the leg bones being eaten raw during butchering (Ewers 1955:149, Wissler 1910: 41). The presence of such units is therefore proposed here to be an indication of proximity to a butchering activity area. The presence of the articular ends of the metapodial without the shaft is proposed to be an indication of marrow extraction. White notes a low percentage of such lower leg units in his examinations of the elements present at a number of fortified earth-lodge village sites in South Dakota and concludes that such elements were often left behind at the kill location (White 1953:162, 1954: 256,261). White does note that "the distance from the village would be the deciding factor on whether or not they were brought in" (1954: 256). Interestingly, the lower leg units were missing in noticeable quantities (circa 50%) at the Olson-Chubbock site, one of the few kill sites for which there is published analysis on the comparative

quantities of the various bone elements present (Wheat 1972). Wheat accounts for their absence as having been removed and 'thrown away' during skinning (1972: 117). It is unclear as to where these units would have been thrown, and why they would not have been left with the rest of the discarded elements which make up the bone bed. An alternate explanation would be that lower leg units were occasionally transported from kill sites along with the more nutritious cuts of meat. Depending upon the proximity of the camp site to the kill, these might be transported back to the camp, or removed at an intermediary processing area. The Vista Shelter (Wood 1968) had a similar bison element assemblage to that found in the Prairie/Plains Side-notched levels in the eastern portion of the Turn; phalanges are extremely abundant and metapodials are present with their shafts destroyed, but other low-utility elements such as the skull and pelvis are rare, as are high utility elements such as femurs. Wood interprets the rock shelter as a hunting camp where cuts of meat were taken to be processed prior to being transported home (1968: 170). The eastern portion of the Turn may have served a similar function, as a primary processing area for meat cuts removed from nearby kills. The fragmented nature of the metapodial shafts at both the Turn and the Vista Shelter may provide the clue as to why the lower leg units were not left behind at the actual kill site. These elements were probably retained for their marrow, which was extracted at the processing area and the associated bones subsequently discarded. Binford rates the metatarsal extremely high and the metacarpal relatively high on his marrow utility index.

The bison elements present in the Avonlea levels and the Prairie/Plains Side-notched levels in the excavation areas to the west of the Grayson Dam location are not as clearly patterned as those described above, but generally contain a much higher degree of elements associated with choice cuts of meat, such as the femur, the hyoid, fetal remains and rib fragments. These would appear to indicate the location of camp site occupations.

The distributions of lithic and ceramic resources for the Prairie/Plains Side-notched levels at the Turn support the functional interpretations made from the faunal assemblage. The areas proposed to be butchering/processing activity areas for the Prairie/Plains Side-notched levels because of the nature of their faunal assemblage were Areas A and B. These areas also produced relatively few lithic artifacts, an average of 5.6 lithic items per square meter for each level in Area A and 1.4 per square meter for each level in Area B. In addition, ceramic remains were recovered from only one of the seven Prairie/Plains Side-notched cultural levels in Areas A and B. In contrast, an average of 43.5 lithic items in Area C and 120.8 in the Garratt site units were calculated for each square meter of each level, and ceramics were recovered from four of the five cultural levels in those two areas. An average of 126.5 lithic items and 48.5 potsherds per square meter per level were recovered from the Avonlea levels at Area A. Finally, all the hearth features were located either in Area C, at the Garratt site or the Avonlea levels at Area A.

A second pattern related to marrow extraction can be elicited

from the faunal material. There was not a single case of an intact long bone or even an intact long bone shaft in the assemblage. There were a number of occurrences of long bone epiphyses, as well as some identifiable long bone shaft fragments in certain levels, so these elements were obviously present at the site, but they were probably smashed before being discarded. There is some possibility that the long bones could have been broken in the process of creating meat units of a size that would fit into the pot, but such a procedure would probably have resulted in a half shaft with the articular end still attached, rather than the existing pattern of fragmented shafts and detached (or missing) articular ends. It is most likely, therefore, that the absence of intact long bones is indicative of fairly extensive marrow extraction. According to the ethnographic references, marrow was, in fact, a common and even relished food item. Hind describes the Cree use of marrow:

... we were again hospitably treated to beaten buffalo meat and marrow fat. Birch bark dishes full of that nutritious but not very tempting food were placed on the ground before us and we were requested to partake of it. The Indians took a piece of the pounded meat in their fingers and dipped it into the soft marrow" (1971: 341).

The extraction of bone grease is another activity often referred to in the ethnographic literature (Mandelbaum 1979: 58; Denig 1961: 13-14). This grease seems to have been an important component of pemmican. The best evidence for bone grease manufacturing at the Turn is found in the middle cultural layer of Area A, where no articular ends of long bones are present, although a number of long bone shaft fragments, as well as other anatomically adjacent elements are present.

A final conclusion can be drawn from the nature of the faunal assemblages at the Turn. Judging from the presence of the lower leg units, as well as the absence of elements with high meat value such as the femur, six of the seven Prairie/Plains cultural levels from Areas A and B can be considered butchering activity areas. These are now treeless areas, directly adjacent to the riverbank. The Avonlea assemblages and both Prairie/Plains Side-notched assemblages from Area C contained elements of high meat value such as would be imported to the campsite and could be interpreted as campsite refuse areas, although a number of these also contained some items that would normally be associated with butchering. The Garratt site faunal assemblages were sparse, but the non-faunal assemblage indicated a campsite activity area. Both of these units are in treed areas, slightly removed from the riverbank. In terms of the 1984/1985 excavations, the open area along the riverbank on the eastern half of the Turn appears to have been used for bison butchering, and the central and the western end of the Turn appears to have been favored for campsite activities. The earlier SMNH excavations were located towards the western end of the Turn, but further in from the riverbank, against the end of a coulee which once drained into the Moose Jaw river. It is significant to note here that although the SMNH excavations revealed a campsite with a number of hearth features and relatively concentrated amounts of potsherds and lithic debris, the faunal assemblage resembled a kill site assemblage when examined using Binford's indices (Emerson 1981: 8-9). Given Emerson's findings for the SMNH Garratt site excavations in

conjunction with the previously described pattern for the 1984/1985 riverbank excavations, it is evident that bison were being killed on or very near to the Turn, and that the primary butchering was performed at the Turn. It should be noted here that Emerson does not come to the same conclusion; she feels that the site topography "does not look particularly suitable for a kill location", and she notes an "absence of most elements belonging to the axial skeleton" (Emerson 1981: 9).

An examination of Morgan's frequency table for bison elements at the Garratt site (1978: 93-95) shows a relatively high number of scapula (a minimum of five individuals represented), but low numbers of vertebrae and pelvis (only one individual represented). She does not list ribs at all. However, it should be noted that both Morgan's and Emerson's analyses were done on the catalogue from two diagonally adjoining 10 x 10 foot units (approximately 18 square meters). Unless they were considered bone tools, all bison remains from the SMNH excavations were identified, recorded and discarded in the field, and only the bison remains for the two described units were recorded. It is possible that smaller rib or vertebrae fragments were present, but were not identified as such - smaller fragments could easily be ignored in field analysis.

Ethnographic references indicate that a common means of cooking meat was by boiling (Grinnel 1892: 205; Wissler 1910: 26). If this was applied to rib sections, it would be necessary to break the ribs so that they would fit in the cooking vessel. Binford actually notes this process in his discussion of Nunamuit caribou processing (1978:

152):

When fresh ribs are boiled, they are generally separated into three rib units and then broken into small units about 4 inches long for boiling. This breakage releases the minor grease and blood marrow into the stew and is considered desirable.

He also notes that after the meat is gnawed from the bones of roasted ribs, "the ribs may be pounded up for bone juice, or alternatively broken and sucked at the ends of the break" (1978: 152). Such treatment would obviously weaken the bones to the point that they would be even more subject to taphonomic forces of disintegration. It is therefore quite possible that the axial elements were present, but merely not recognized as such, especially if emphasis was placed on larger, more obvious elements. An examination of the small sample of bison bones that were retained by the SMNH crew revealed the presence of several rib and vertebrae spine fragments. On the other hand, it is possible that the SMNH catalogue does reflect an actual general absence of axial elements in the two particular units for which bison remains were recorded. However, this does not reflect the entire assemblage at the Turn. Axial elements were retrieved from the 1984/1985 excavations, although most of these were somewhat fragmented. The majority of the vertebrae recovered were actually from the Garratt site excavation area, somewhat closer to the river than the main block of SMNH excavations. Alternately, the axial elements may have been purposefully removed from the activity area excavated by the SMNH, possibly thrown to the dogs, or used for other purposes, such as the use of ribs for boys sleds (Ewers 1955: 151).

In terms of the topographical suitability of the Garratt site for a kill location, it is located near the entrance of a coulee or drainage channel which once drained into the Moose Jaw River. The coulee might have provided an excellent location for a bison trap or pound, and provided a natural descent route for animals wishing to reach the river. The kill-like nature of the faunal assemblage from the Garratt site, as well as those from Areas A and B of the Davies site indicates the very close proximity of a kill location, such that most of the primary butchering was done on or near the campsite. There are numerous ethnographic references to trapping bison in snow filled gullies (Denig 1930: 535), chasing them onto the ice until they slipped and fell or fell through the ice (Skinner 1914: 525), or retrieving drowned bison from the river (Denig 1961: 49). In any case, the valley must have provided an ideal wintering place for man and beast alike, and it is not unlikely that the prehistoric occupants were able to trap or kill bison on the surrounding floodplain and coulees near the Turn.

8.3 Resource Utilization

Bison is obviously the most important food resource at the Turn. The faunal assemblage indicates that bison were hunted and killed relatively near the Turn, and that that resource was used efficiently, with very little of the consumable portions of the bison wasted. Birds, fish and canids were probably important seasonal resources. Fox and rabbit may also have been hunted. Chokecherries

and possibly goosefoot and hawthorn were probably utilized, and there is historic evidence that either the wild artichoke, the prairie turnip, or the Indian potato was a drawing card for native groups.

The prehistoric occupants at the Turn also availed themselves of a number of non-food resources provided by the valley.

Wood for fuel was obviously an important consideration, especially during the winter when buffalo chips would be difficult to find. The prehistoric occupants at the Turn used ash, poplar and/or willow as fuel. The prehistoric occupants at the Turn were using a substantial amount of pottery, and may have taken advantage of the nearby clay sources. Clay lenses were encountered during excavations at the Turn, and although a local source was not confirmed through trace element analysis, it is quite likely that local clays were taken advantage of. It should be noted here that massive clay sources exist a couple of kilometers downstream in River Park; this was the location of a productive brick factory in historic times.

The lithic industry for the Prairie/Plains Side-notched levels at the Turn also shows an awareness and use of local raw materials. Swan River chert, pebble cherts, silicified peat and quartzite were extensively used, the latter two especially for the cruder marginally retouched tools and choppers. It is difficult to locate exact sources for these materials; they were likely locally available, although not necessarily right at the Turn. It should be noted, however, that unworked pebble cherts were recovered from the surface gravels at the adjacent Compass site to the southwest.

Knife River flint, probably from North Dakota, and fused shale,

possibly from the Estevan area, were also present in the assemblage. These were generally reserved for the finer tools. This would indicate either some trade with groups to the southwest and southeast, or resource gathering forays to those areas by the local groups. The possibility of trade is also posed by the previously mentioned basswood fragment which may have been imported to the site from the eastern woodlands in the form of a vessel or utensil made from that wood.

9.0 SUMMARY AND CONCLUSIONS

The examination of the archaeological resources at the Turn has demonstrated the possibility of obtaining valuable interpretive information from a limited and spread out excavation.

The archaeological resources, especially for the Prairie/Plains Side-notched occupation at the Turn are considerably more extensive than the area originally excavated by the SMNH. Traces of human occupation were found all along the riverbank from the northeast end to the southwest end, and extending across the floodplain right to the valley slopes. The northeastern end, often referred to as the Davies site (EcNj-6) appears to have been used along the riverbank as a bison butchering area during the Prairie/Plains Side-notched period and as a camp/processing area during the Avonlea occupation. The ploughed field in the northern end of the Turn was not subjected to any extensive excavation, and faunal remains were not systematically collected from the surface. However, the presence and frequency of lithics and ceramics in that area may indicate a campsite activity. The southwestern portion of the Turn, commonly referred to as the Garratt site (EcNj-7), was a location for relatively intensive campsite activities during the Late Prehistoric.

The cultural assemblage at the Turn is typical of the Late Prehistoric period in Southern Saskatchewan. Excavation constraints and the scarcity of diagnostic artifacts did not allow for separation of the Prairie Side-notched and Plains Side-notched assemblages,

except on an extremely localized basis (in individual levels in particular excavation areas). However, there is some evidence of numerous discrete occupations representing each cultural complex. A small number of check-stamped potsherds recovered from the Garratt site implies some affiliation with or influence by the Mortlach culture as described by Wettlaufer (1955). Ceramics from that period are presently being examined by a number of archaeologists at the University of Saskatchewan and elsewhere, and their conclusions may shed further light on the Plains Side-notched assemblage from the Turn. The 1985 Avonlea level excavations involved only 3 square meters, but a substantial artifact and faunal assemblage was recovered. The ceramics from the Avonlea assemblage from both the 1985 excavations and the earlier SMNH excavations display a surface finish typical of Avonlea ceramics in this area and to the north. The decorative elements are somewhat unusual in that they contain a higher degree of decoration than Avonlea ceramics recovered elsewhere, and a number of the vessels contain horizontal incised lines. However, a larger sample of Avonlea ceramic assemblages may show such attributes to be more common in the future.

The 1984/1985 investigations have shed some light upon Emerson's enigmatic portrayal of the Garratt site as "a residential site dominated by a kill site-like assemblage" (1981: 9), and indicated the probability of a kill location or kill locations in close proximity to the campsite at the Turn.

In terms of broader implications for lifeways on the Saskatchewan Plains during this period, several observations can be

made with respect to the 1984/1985 assemblage. The lithic assemblage contains a mixture of local and exotic raw materials. The distribution of these amongst the various tool and debitage categories reflect Marvin Thomas' findings (1983: 101) when reviewing lithic raw material selection at a number of Qu'Appelle Basin sites, that most artifacts manufactured from Knife River flint, chalcedony, jasper and possibly fused shale were brought to the sites as finished implements or preforms, while significantly more primary reduction of silicified peat and Swan River chert occurred on the sites. This not only substantiates the notion of trade routes to the southwest, but raises the question of trade in finished artifacts and preforms rather than the actual raw material nodules. Similar raw material distribution studies of assemblages from sites closer to the sources of these materials might prove interesting. A high incidence of bipolar cores made from fused shale can be observed in the Garratt site assemblage; this raises the question of a source for such material, and possible trade or mining expeditions to the Estevan coal beds to the southeast. Trace element analysis of the fused shale from the Garratt site and other Qu'Appelle Basin sites may assist in locating a source for this material. Finally, the tentative presence of a basswood fragment in a Prairie or Plains Side-notched level at the Turn raises the possibility of trade with (or visits from) Woodland groups to the east. Occurrences of Woodland Blackduck ceramics in the Qu'Appelle Valley system have been noted at two sites, the Jelly Ranch site on the Arm River (Saylor, personal communication, 1989) and the Lebret site in the Qu'Appelle

River Valley (David Meyer, personal communication, 1989), and further evidence of woodland incursions in the form of artifacts or human groups may substantiate such a notion.

The question of seasonality and seasonal rounds for the Prairie/Plains Side-notched period needs to be reconsidered. The notion of a heavy dependence upon a regular bison migratory pattern with an extended period of absence from the base camp over the summer has been challenged. The possibility of occasional summer occupations as well as base camp from which briefer hunting forays to the surrounding plains took place is worth considering, especially for a campsite located in a valley as rich in resources as is the Turn. Admittedly, the evidence for summer occupation is based on some tentative archaeological evidence, and depends heavily upon historic and ethnographic references and the assumption of the relevance of such references to the lifestyles of the groups occupying the Turn. However, Grace Morgan's case for the regularity of the prehistoric bison migrations as well as the seasonal round of prehistoric groups in the area is based on very similar types of evidence and assumptions. The need for more concrete archaeological evidence is obvious here, especially in the form of paleobotanical analysis, accurate identification of migratory bird remains, and bison population studies on both campsite and killsite assemblages in the area.

REFERENCES

- Adams, Gary F.
1977 The Estuary Bison Pound Site in Southwestern Saskatchewan. Archaeological Survey of Canada, Mercury Series, Paper No. 68, National Museum of Man, Ottawa.
- Arthur, George
1975 An Introduction to the Ecology of Early Historic Communal Bison hunting Among the Northern Plains Indians. Archaeological Survey of Canada, Mercury Series, Paper No. 37, National Museum of Man, Ottawa.
- Binford, Lewis R.
1978 Nunamuit Ethnoarchaeology. New York: Academic Press.
- Brink, Jack
1986a Dog Days in Southern Alberta. Archaeological Survey of Alberta Occasional Paper No. 28.
- 1986b Final Report of the 1984 Season at Head-Smashed-In Buffalo Jump, Alberta. Archaeological Survey of Alberta Manuscript Series #9, Edmonton
- Brink, J., M. Wright, B. Dawe and D. Glaum
1985 Final Report of the 1983 Season at Head-Smashed-In Buffalo Jump, Alberta. Archaeological Survey of Alberta Manuscript Series #1.
- Boller, Henry, A.
1959 Among the Indians: Eight Years in the Far West 1858-1866, edited by Milo Mitten Quaife. R.R. Donnely & Sons, Chicago.
- Bowsfield, Hartwell, editor
1977 The Letters of Charles John Brydges, 1879 - 1882. Hudson's Bay Record Society, Winnipeg.
- Byrne, W.J.
1973 The Archaeology and Prehistory of Southern Alberta as Reflected by Ceramics. Archaeological Survey of Canada, Mercury Series, Paper No. 14, National Museum of Man, Ottawa.
- Canada, Department of the Interior
1887 Descriptions of Townships of the North-West Territories, Dominion of Canada, Between the Second and Third Initial Meridians. Ottawa: MacLean Roger & Co.

Canada Soil Survey Committee

- 1978 The Canadian System of Soil Classification. Research Branch, Canadian Department of Agriculture Publication #1646.

Cowie, Isaac

- 1913 The Company of Adventurers. William Briggs, Toronto.

Denig, Edwin Thomson

- 1930 Indian Tribes of the Upper Missouri, edited by J.M.B. Hewitt. Forty-Sixth Annual Report of the Bureau of American Ethnology: 375-6256.

- 1961 Five Indian Tribes of the Upper Missouri, edited by John C. Ewers. University of Oklahoma Press, Norman.

Dyck, Ian G.

- 1977 The Harder Site: A Middle Period Bison Hunter's Campsite in the Northern Great Plains. Archaeological Survey of Canada, Mercury Series, Paper No. 67, National Museum of Man, Ottawa.

- 1983 The Prehistory of Southern Saskatchewan. In Tracking Ancient Hunters: Prehistoric Archaeology in Saskatchewan, edited by H.T. Epp and Ian Dyck, pp. 63-139. Saskatchewan Archaeological Society, Regina, Saskatchewan.

Ebell, S.B.

- 1964 An Eden and Scottsbluff Site in South Central Saskatchewan. Saskatchewan Archaeology Newsletter #6: 1-3.

- 1971 Three Early Man Recoveries. Saskatchewan Archaeology Newsletter #33: 6-7.

- 1974 The Survey of Highway No. 1 West. Saskatchewan Archaeology Newsletter #44: 21-22.

- 1975 A Cody-Complex Site in South Central Saskatchewan. Saskatchewan Archaeology Newsletter #49: 1-6.

- 1980 The Parkhill Site: an Agate Basin Surface Collection in the South Central Saskatchewan. Paslog #4. Saskatchewan Culture and Youth, Regina, Saskatchewan.

Emerson, Alice H.

- 1981 Some Examples of Binford's Models of Faunal Assemblage Composition Applied to Plains Bison Assemblages. Paper presented to the 39th Plains Conference, Bismark, North Dakota.

- Epp, Henry T.
1988 Way of the Migrant Herds: Dual Dispersion Strategy Among Bison. Plains Anthropologist 33 (121): 309-320.
- Ericksen-Brown, Charlotte
1979 Use of Plants for the Past 500 Years. Breezy Creeks Press, Aurora, Ontario.
- Ewers, John C.
1955 The Horse in Blackfoot Indian Culture. Bureau of American Ethnology, Bulletin 159.

1958 The Blackfeet: Raiders on the Northwestern Plains. Norman, University of Oklahoma Press.
- Fraley, David C.
1988 Avonlea and Besant in Eastern Montana: Archaeological Distributions in the Lower Yellowstone Region. In Avonlea Yesterday and Today: Archaeology and Prehistory, edited by Leslie B. Davis, pp.129-136. Saskatchewan Archaeological Society, Regina.
- Fraley, David C. and Ann M. Johnson
1981 Ceramics and Cultural Affiliation at the Goheen Site, 24WX30. Archaeology in Montana 22(1):1-22.
- Fredlund, Lynn B.
1988 Distribution and Characteristics of Avonlea South of Yellowstone River in Montana. In Avonlea Yesterday and Today: Archaeology and Prehistory, edited by Leslie B. Davis, Pp. 171-182. Saskatchewan Archaeological Society, Regina.
- Frison, George C.
1988 Avonlea and Contemporaries in Wyoming. In Avonlea Yesterday and Today: Archaeology and Prehistory, edited by Leslie B. Davis, Pp. 155-170. Saskatchewan Archaeological Society, Regina.
- Grinnel, G.B.
1892 Blackfoot Lodge Tales: The Story of a Prairie People. New York.
- Hanley, Kerry
1983 A Floristic Inventory of the 'Turn Area' of the 'Wakamow Valley Authority'. Unpublished manuscript on file at the Wakamow Valley Authority Office, Moose Jaw, Saskatchewan.

- Hanson, Jeffery R.
 1984 Bison Ecology in the Northern Plains and a Reconstruction of Bison Patterns for the North Dakota Region. Plains Anthropologist 29: 93-113.
- Harmon, Daniel W.
 1911 A Journal of Voyages and Travels in the Interior of North America, edited by Daniel Haskel. Courier Press, Toronto, Ontario.
- Harris, W.C., A. Kabzems, A.L. Kosowan, G.A. Padbury and J.S. Rowe
 1983 Ecological Regions of Saskatchewan. Technical Bulletin No. 10, Forestry Division, Saskatchewan Parks and Renewable Resources.
- Hind, Henry Youle
 1971 Narrative of the Canadian Red River Exploring Expedition of 1857 and of The Assiniboine and Saskatchewan Exploring Expedition of 1858. Charles E. Tuttle Company, Rutland, Vermont.
- Johnson, Ann M.
 1988 Parallel Grooved Ceramics: An Addition to Avonlea Material Culture. In Avonlea Yesterday and Today: Archaeology and Prehistory, edited by Leslie B. Davis, Pp. 137-143. Saskatchewan Archaeological Society, Regina.
- Johnson, Eldon A.
 1986 Properties and Sources of Some Saskatchewan Lithic Materials of Archaeological Significance. Unpublished M. A. thesis, University of Saskatchewan, Saskatoon.
- Joyes, Dennis C.
 1988 A Summary and Evaluation of Avonlea in Manitoba. In Avonlea Yesterday and Today: Archaeology and Prehistory, edited by Leslie B. Davis, Pp. 227-236. Saskatchewan Archaeological Society, Regina.
- Kaye, Barry and D.W. Moodie
 1981 Rooting for the Truth: A Reply to Reid on the Importance and Distribution of Psoralea esculenta, Plains Anthropologist 26 (91): 81-83.
- Kehoe, Thomas F.
 1964 Middle Woodland Pottery From Saskatchewan. Plains Anthropologist 9 (23): 51-53.
 1966 The Distribution and Implications of Fluted Points in Saskatchewan. American Antiquity 31 (4): 530-539.

- Kehoe, Thomas F.
 1973 The Gull Lake Site: A Prehistoric Bison Drive in Southwestern Saskatchewan. Publications in Anthropology and History, No. 1. Milwaukee Public Museum, Milwaukee.
- Kehoe, Thomas F, Bruce McCorquodale and Alice B. Kehoe
 1988 1984 Excavations at the Avonlea Type Site. In Avonlea Yesterday and Today: Archaeology and Prehistory, edited by Leslie B. Davies, Pp. 11-23. Saskatchewan Archaeological Society, Regina.
- Kidd, Kenneth E.
 1986 Blackfoot Ethnography. Archaeological Survey of Alberta Manuscript Series No. 8.
- Klimko, Olga
 1985a Archaeological Investigations at the Avonlea Site (EaNg-1) Located Within the Proposed Reconstruction of Highway No. 334. Heritage investigation, Saskatchewan Research Council, Saskatoon.
- 1985b The Gravel Pit and Eastcott Flat Sites, edited by David Meyer, Nipawin Reservoir Heritage Study, Volume 7, Saskatchewan Research Council, Saskatoon.
- Klimko, Olga and Margaret G. Hanna
 1988 The Avonlea Type Site Revisited: A Report on Excavations and Ceramic Analysis. In Avonlea Yesterday and Today: Archaeology and Prehistory, edited by Leslie B. Davis, Pp. 25-31. Saskatchewan Archaeological Society, Regina.
- Knight, Leith
 1976 The Turn. Unpublished Manuscript. Wakimaw Valley Authorities, Moose Jaw, Saskatchewan.
- 1982 All the Moose - All the Jaw. Moose Jaw 100, Moose Jaw.
- Krozser, Kit
 1985 The 1984 Archaeological Inventory of RiverPark and Kingsway Park, Moose Jaw, Saskatchewan. Report submitted to the Archaeological Resource Management Section of the Saskatchewan Department of Culture and Recreation. Permit No. 84-13.
- Lavolette, Rev. Gontran
 1944 The Sioux Indians in Canada. Marian Press, Regina, Saskatchewan.
- Long, Robert J.
 1980 Landscapes: The Floodplains. Produced for Saskatchewan Environment by Sask Media.

- Loveseth, Bea
1983 Historical Resources Impact Assessment and Archaeological Conservation Studies, Sundance Oil Canada Ltd. 1981 Oil Gathering System Expansion and Alterations, Wintering Hills, Alberta. Report on file Archaeological Survey of Alberta; Edmonton, Alberta.
- Lowie, Robert H.
1909 The Assiniboine. American Museum of Natural History, Anthropological Papers, Volume 4 (1) New York.
- Lugenbeal, Edward
1978 Brainerd Ware Occurrence and Chronological Relationships. In Occasional Publications in Minnesota Anthropology, 2: 47-55.
- MacDonald, George F.
1968 Debert: A Palaeo-Indian Site in Central Nova Scotia. Anthropological Papers, No. 16, National Museum of Canada, Ottawa.
- Maher, R.V., G.W. Argus, V.L. Harms and J.H. Hudson
1979 The Rare Vascular Plants of Saskatchewan. National Museum of Natural Sciences Syllogus No. 20, Ottawa.
- Maclean, John
1896 Canadian Savage Folk: The Native Tribes of Canada. William Briggs, Toronto (Facsimile edition reprinted by Coles Publishing Company, Toronto: 1971).
- Mandelbaum, David G.
1979 The Plains Cree: An Ethnographic, Historical, and Comparative Study. Canadian Plains Studies No. 9, Canadian Plains Research Centre, University of Regina, Regina.
- McHugh, Tom
1972 The Time of the Buffalo. Alfred A. Knopf, New York.
- Meyer, David
1981 Late Prehistoric Assemblages From Nipawin: The Pehonan Complex. Saskatchewan Archaeology 2: 4-38.
1985 A component in the Scottsbluff Tradition: Excavations at the Niska Site. Canadian Journal of Archaeology, Volume 9 (No. 1): 1-37.
- Meyer, David, Olga Kliminko and James Finnigan
1988 Northernmost Avonlea in Saskatchewan. In Avonlea Yesterday and Today: Archaeology and Prehistory, edited by Leslie B. Davis, Pp. 33-42. Saskatchewan Archaeological Society, Regina.

- Miller, George L. & Pacey, Antony
1985 Impact of Mechanization in the Glass container Industry: The Dominion Glass Company, A Case Study. Historical Archaeology; Volume 19: 38-50.
- Milne, Laurie Ann
1988 The Larson Site (D10n-3) and the Avonlea Phase in Southeastern Alberta. In Avonlea Yesterday and Today: Archaeology and Prehistory, edited by Leslie B. Davis, Pp. 33-42. Saskatchewan Archaeological Society, Regina.
- Milne-Brumley, Laurie Ann
1978 The Saamis Site: A Late Prehistoric - Prohistoric Campsite in Medicine Hat, Alberta. Archaeological Survey of Canada, Mercury Series, Paper No. 79, National Museum of Man, Ottawa.
- Morgan, R.G.
1979 An Ecological Study of the Northern Plains as Seen Through the Garratt Site. Occasional Papers in Anthropology #1, Department of Anthropology, University of Regina, Regina, Saskatchewan.
- 1980 Bison Movement Patterns on the Canadian Plains: An Ecological Analysis. Plains Anthropologist 25: 142-160.
- Moss, H.C.
1978 A Guide to Understanding Saskatchewan Soils. University of Saskatchewan; Saskatoon, Saskatchewan.
- Neuman, R.W.
1960 The Truman Mounds. American Antiquity 26: 78-92.
- Oliver, S.C.
1962 Ecology and Continuity as Contributing Factors in the Social Organization of the Plains Indians. University of California Publications in American Archaeology and Ethnology 48: 1-90.
- Pettipas, L.
1975 The Paleo-Indian Prehistory of Saskatchewan. Saskatchewan Archaeology Newsletter #50: 1-32.
- Phenix, T.S.
1964 The Alberta Point in Time and Space. Saskatchewan Archaeology Newsletter #5: 4.
- Pingert, D.
1967 Excavation of the Garratt Site in Moose Jaw. Saskatchewan Archaeology Newsletter #17: 3.

Quaife, Milo Mutton (editor)

- 1921 Alexander Henry's Travels and Adventures in the Years 1760 - 1776. R.R. Donnelley and Sons, Chicago.

Quigg, J. Michael

- 1986a The Crown Site (FhNg-86) Excavation Results. Nipawin Reservoir Heritage Study, Volume 8, edited by David Meyer. Saskatchewan Research Council, Saskatoon.

- 1986b Ross Glen: A Besant Stone Circle Site in Southeastern Alberta. Archaeological Survey of Alberta Manuscript Series #10. Alberta Culture, Edmonton.

- 1988a A Ceramic Bearing Avonlea Component in Southwestern Alberta. In Avonlea Yesterday and Today: Archaeology and Prehistory, edited by Leslie B. Davis, pp. 67-79. Saskatchewan Archaeological Society, Regina.

- 1988b A New Avonlea Ceramic Style from North - Central Montana. In Avonlea Yesterday and Today: Archaeology and Prehistory, edited by Leslie B. Davis, pp. 145-153. Saskatchewan Archaeological Society, Regina.

Reeves, B.O.K.

- 1983 Culture Change in the Northern Plains: 1000 B.C. - A.D. 1000. Archaeological Survey of Alberta Occasional Paper 20. Edmonton, Alberta.

Reid Crowther and Partners; Hilderman, Feir, Witty and Associates; Clifton Associates Limited; Wiens and Associates

- 1979 Wakamow: A Long Term Development Master Plan for the Moose Jaw River Valley at the City of Moose Jaw, Saskatchewan. Technical report submitted to the City of Moose Jaw and Saskatchewan Urban Affairs; available at in the Wakamow Valley Authority offices.

Reineck, H.E. and I.B. Singh

- 1980 Depositional Sedimentary Environments: With Reference to Terrigenous Clastics. Second, Revised and Updated Edition, Springer-Verlag, New York.

Richards, J.H. and K.I. Fung

- 1969 Atlas of Saskatchewan. University of Saskatchewan; Saskatoon, Saskatchewan.

Scace, R.

- 1979 Human Occupance: The Rejuvenation of Man and Land. Unpublished manuscript on file at the offices of Wakamow Valley Authority, Moose Jaw, Saskatchewan.

- Scoggan, H.J.
1978-79 The Flora of Canada (in four parts). National Museums of Canada, Ottawa, Ontario.
- Skinner, Alanson
1914 Notes on the Plains Cree. American Anthropologist 16: 68-87.
- Smith, Brian J.
1986 The Lebret Site. Unpublished Master's Thesis, University of Saskatchewan. Department of Anthropology and Archaeology, Saskatoon.
- Smith, Brian J. and Ernest G. Walker
1988 Evidence for Diverse Subsistence Strategies in an Avonlea Component. In Avonlea Yesterday and Today: Archaeology and Prehistory, edited by Leslie B. Davis, Pp. 81-88. Saskatchewan Archaeological Society, Regina.
- Speth, J.D.
1983 Bison Kills and Bone Counts. University of Chicago Press, Chicago.
- Spry, I.M.
1968 The Papers of the Palliser Expedition, 1857-1860, Toronto: The Champlain Society.
- Stanfill, Allan L.
1988 Avonlea Projectile Point Manufacture: A Testable Model. In Avonlea Yesterday and Today: Archaeology and Prehistory, edited by Leslie B. Davis, Pp. 251-256. Saskatchewan Archaeological Society, Regina.
- Storck, P.L.
1973 A Description of Some Paleo-Indian and Archaic Projectile Points and Knives from Saskatchewan, Manitoba and Alberta in Collections of the Royal Ontario Museum. Saskatchewan Archaeology Newsletter #41: 1-28.
- Thomas, Marvin
1983 Lithic Raw Material Selection of a Number of Archaeological Sites in the Qu'Appelle Basin. Unpublished B.A. honors thesis, Department of Anthropology, University of Regina.
- Todd, Lawrence C. Jr.
1983 Taphonomy: Fleshing Out the Dry Bones of Plains Prehistory. The Wyoming Archaeologist 26 (3-4): 36-46.

- Tratebas, Alice and Ann M Johnson
 1988 Three Avonlea Bison Kill Sites in the Milk River Drainage of Northeastern Montana. In Avonlea Yesterday and Today: Archaeology and Prehistory, edited by Leslie B. Davis, Pp. 89-100. Saskatchewan Archaeological Society, Regina.
- Turner, A.R., ed.
 1972 Reminiscences of the Honorable J.A. Calder. Saskatchewan History 25(2): 55-75.
- Turney-High, Harry H.
 1941 Ethnography of the Kutenai. American Anthropological Association, Memoir No. 56. Menasha, Wisconsin.
- Vehik, Susan C.
 1977 Bone Fragments and Bone Crease Manufacturing: A Review of Their Archaeological Use and Potential. Plains Anthropologist 22 (77): 169-182.
- Verbicky-Todd, Eleanor
 1984 Communal Buffalo Hunting Among the Plains Indians. Archaeological Survey of Alberta Occasional Paper No. 24.
- Vickers, J. Roderick
 1986 Alberta Plains Prehistory: A Review. Archaeological Survey of Alberta Occasional Paper No. 27.
- Watson, Gilbert C.
 1966 The Garratt Site (EcNj-7): Research Reports, 1966. Saskatchewan Archaeology Newsletter 15: 3.
 1967 Report on the Second Season's Excavations at the Walter Felt Site. Saskatchewan Archaeology Newsletter 17: 7-8.
 1968 Research Reports, 1968. Saskatchewan Archaeology Newsletter 23: 10.
 1969 Research Reports 1969. Saskatchewan Archaeology Newsletter 27: 8-10.
- Wettlaufer, B.N.
 1955 The Mortlach Site in the Besant Valley of Central Saskatchewan. Anthropological Series #1. Department of Natural Resources, Regina, Saskatchewan.
- Wettlaufer, B.N. and Mayer-Oakes, W.J.
 1960 The Long Creek Site. Saskatchewan Museum of Natural History Anthropological Series #2. Department of Natural Resources, Regina, Saskatchewan.

- Wheat, Joe Ben
1972 The Olsen-Chubbuck Site: A Paleo-Indian Bison Kill.
Memoirs of the Society for American Archaeology No. 26.
- White, T.E.
1953 Observations on the Butchering Technique of Some
Aboriginal Peoples No. 2. American Antiquity 2: 160-
164.
- 1954 Observations on the Butchering Technique of Some
Aboriginal Peoples Nos. 3, 4, 5, and 6. American
Antiquity 3: 254-264.
- Wood, W. Raymond
1968 Mississippian Hunting and Butchering Patterns: Bone
from the Vista Shelter, 23SR-20, Missouri. American
Antiquity 33(2): 170-179.
- Wilson-Meyer, A.D. and M.I. Carlson
1984 The Yellow Sky Site (Fj0d). Report submitted to the
Heritage Branch, Saskatchewan Department of Culture and
Recreation, Regina. Permit 82-33.
- Wissler, Clark
1910 Material Culture of the Blackfoot Indians.
Anthropological Papers of the American Museum of Natural
History 5 (1).
- Zierhut, N.W.
1967 Bone Breaking Activities of the Calling Lake Cree.
Alberta Anthropologist 1: 33-36.

APPENDIX I

Species List For the Turn (From Hanley 1983: 104)

<u>Acer Negundo</u>	<u>Delphinium bicolor</u>
<u>Agopyron christatum</u>	<u>Descurainia sophia</u>
<u>Agropyron repens</u>	<u>Draba nemorosa</u>
<u>Alisma plantago-aquatica</u>	<u>Eleocharis acicularis</u>
<u>Allium textile</u>	<u>Eleocharis palustris</u>
<u>Amaranthus retrofexus</u>	<u>Elymus canadensis</u>
<u>Amelancier alnifolia</u>	<u>Equisetum arvense</u>
<u>Artemesia gnapholodes</u>	<u>Erigeron canadensis</u>
<u>Axyris amaranthoides</u>	<u>Erigeron philadelphicus</u>
<u>Beckmannia syziagachne</u>	<u>Erysimum cheiranthoides</u>
<u>Bromus inermis</u>	<u>Euphorbia esula</u>
<u>Capsella bursa-pastoris</u>	<u>Fluminea festucacea</u>
<u>Carduus nutans</u>	<u>Fraxinus Pennsylvanica var</u>
<u>Carex ssp.</u>	<u>subinteqerrima</u>
<u>Cicuta maculata</u>	<u>Galeopsis tetrahit</u>
<u>Cirsium arvense</u>	<u>Galium boreale</u>
<u>Chenopodium album</u>	<u>Hippuris vulgaris</u>
<u>Convolvulus arvensis</u>	<u>Hordum jabatum</u>
<u>Convolvulus speium</u>	<u>Iva axillaris</u>
<u>Convolvulus spoiium var.</u>	<u>Kochia scoparia</u>
<u>americanus</u>	<u>Lactica serriola</u>
<u>Cornus canadensis</u>	<u>Lactuca palchella</u>
<u>Cornus stolonifer</u>	<u>Lappula echinata</u>
<u>Crataequs cotundifolia</u>	<u>Linaria vulgaris</u>

<u>Limnolobos lewisii</u>	<u>Rosa acicularis</u>
<u>Lonicera glaucescens</u>	<u>Rosa woodsii</u>
<u>Maianthemum canadense</u>	<u>Rumex crispus</u>
<u>Malva neglecta</u>	<u>Ranunculus acris</u>
<u>Matricaria matricarioides</u>	<u>Salix sp.</u>
<u>Medicago sativa spp. sativa</u>	<u>Salix amygdaloides</u>
<u>Melilotus alba</u>	<u>Salix interior</u>
<u>Melilotus officinalis</u>	<u>Salsola Kali var. tenuifolia</u>
<u>Menta arvensis</u>	<u>Scirpus paludosus</u>
<u>Moldavica parviflora</u>	<u>Scirpus validus</u>
<u>Opuntia polyacantha</u>	<u>Setaria viridis</u>
<u>Oryzopsis asperifolia</u>	<u>Shepherdia argentea</u>
<u>Oxytropis delexa</u>	<u>Silene cucubalus</u>
<u>Petasites vitifolius</u>	<u>Sisymbrium altissimum</u>
<u>Phragmites communis</u>	<u>Smilacina stellata</u>
<u>Plantago major</u>	<u>Solidago canadensis</u>
<u>Poa pratensis</u>	<u>Sonchus oleraceus</u>
<u>Polygonum acheneum</u>	<u>Spartanum eurycarpum</u>
<u>Polygonum lapathifolium</u>	<u>Spiraea spp.</u>
<u>Polygonum natans</u>	<u>Stachys palustris</u>
<u>Pontilla norvegica</u>	<u>Stipa comata</u>
<u>Prunus pennsylvanica</u>	<u>Symphoricarpos occidentalis</u>
<u>Prunus virginiana</u>	<u>Syringa spp.</u>
<u>Ranunculus macounii</u>	<u>Taraxacum officinale</u>
<u>Ribes americanum</u>	<u>Thlaspi arvense</u>
<u>Ribes eximium</u>	<u>Tragopogon dubius</u>

Trigolium fragferum

Viola Rugulosa

Typha latifolia

Xanthium italicum

Ulmus americana

Urtica Dioica var. procera

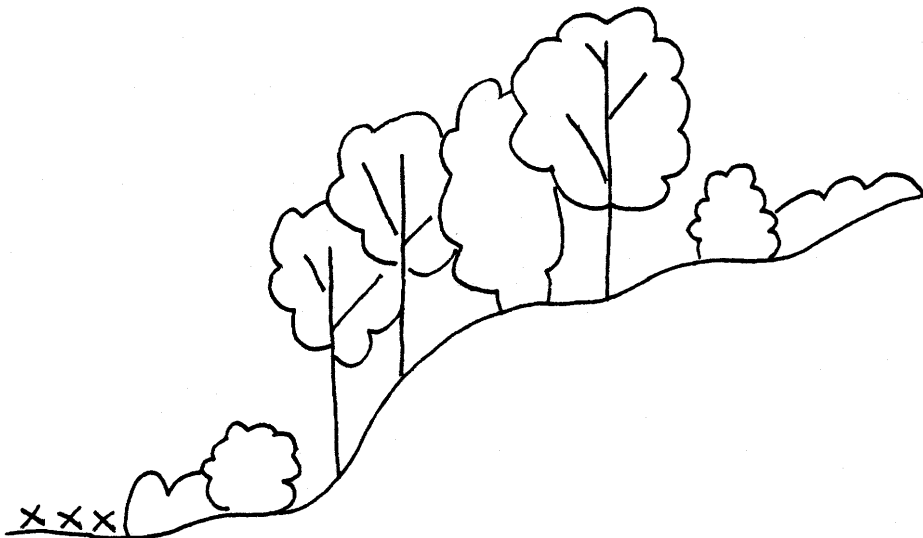
Vicia sparsifolia

Description of Natural Second Growth Areas

(summarized from Hanley 1983: 33-37)

This area has been divided into five sub-areas based on location:

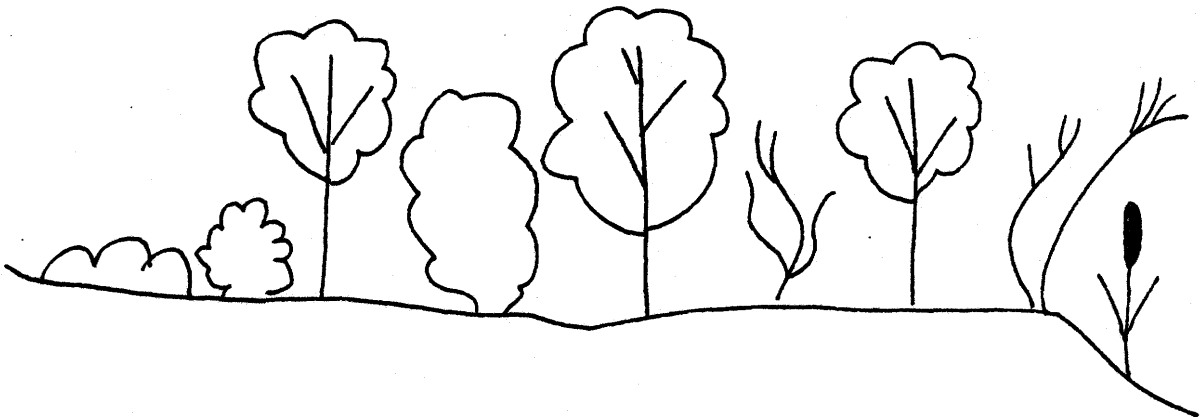
- A. West Valley Slope - located on the very steep southwest wall
 - one of the least disturbed areas
 - dominated by: Chokecherry (*Prunus virginiani*), Manitoba Maple (*Acer negundo*), Green Ash (*Fraxinus pennsylvanica* var. *subinterrima*) and Sandbar Willow (*Salix interior*), depending upon the location on the slope.



Grasses Rose Snow Manitoba Choke Green Snow Rose
Berry Maple Cherry Ash Berry

Figure I-1: Vegetation Profile for Subarea A.

- B. Central River Bank Area - Between old Grayson Dam and Kingsway Dam
- dense vegetation, but disturbed by numerous foot trails
 - dominant species include: Sandbar Willow, Manitoba Maple, Red Osier Dogwood (*Cornus Stolonifera*), Chokecherry, Saskatoon (*Amelancier alnifolia*) and Prickly Rose (*Rosa acicularis*).

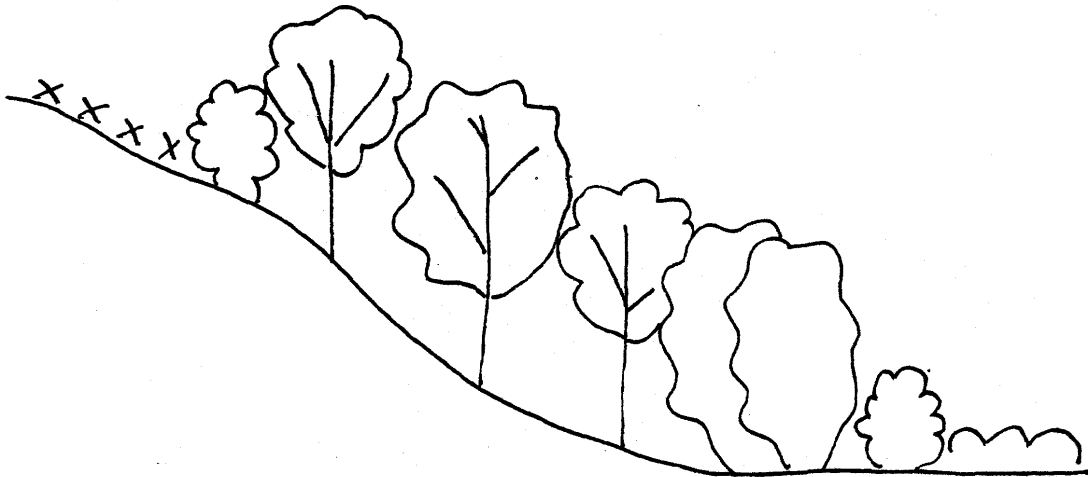


Rose Berry Snow Maple Manitoba Maple Choke Cherry Green Ash Red-Osier Dogwood Manitoba Maple Willow Cat-Tail

Figure I-2: Vegetation Profile for Subarea B.

- C. East River Bank Area - from old Grayson Dam to 7th Avenue
- steep area, but has dense growth due to moisture available
 - near complete dominance by willows and Chokecherries, occasional association of Manitoba Maple and rose.

- D. North and East Valley Slope - north and east valley walls
- largest subdivision of natural secondary growth area.
 - dominated by: Manitoba Maple, Western Snowberry (*Symphoricarpos accidentalis*), Rose, Chokecherry, Green Ash, Saskatoon, Round-Leaved Hawthorne (*Crataegus rotundifolia*), and sometimes smooth Brome.



Grasses Snow Manitoba Green Manitobe Choke Snow Rose
 Berry Maple Ash Maple Cherry Berry

Figure I-3: Vegetation Profile for Subarea D - North Wall.

- E. Trees Surrounding Marsh - Densely wooded area surrounding eastern and southern edge of marsh
- dominated mostly by Chokecherries, especially in outer portions, patches of Green Ash in the centre of this band, and associations of Manitoba Maples in between