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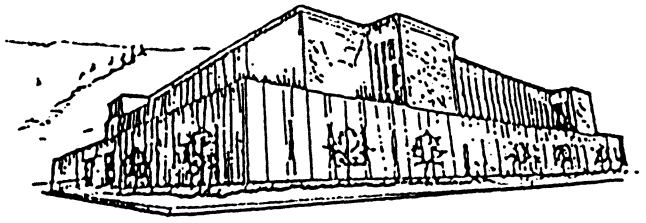

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The McKean Complex: An Analysis of Six Middle Prehistoric Period Sites in the Northwestern Plains

by

Patrick J. Rennie

B.S., Montana State University, 1989

Presented in partial fulfillment of the requirements

for the degree of

Master of Arts

University of Montana

1994

Approved by

Chairman, Board of Examiners

Dean, Graduate School

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The McKean Complex: An Analysis of Six Middle Prehistoric Period Sites in the Northwestern Plains (184 pp.)

Director: Thomas A. Foor

TAF

Since its identification in 1954, the McKean complex has been one of the most researched and poorly understood of all archaeologically defined prehistoric cultural entities in the northern Great Plains. Although most researchers agree that the McKean complex can be securely placed within the temporal parameters of 3000 to 5000 radiocarbon years before the present, few agree about the associated projectile point types, the origins, subsistence base, and geographic distribution of the peoples who used the McKean complex technology. This thesis is a critical analysis of six archaeological sites in the northwestern Plains that have a component belonging to the McKean complex. Possible origins, subsistence base strategies, and a discussion of the distribution in space and time of each projectile point type associated with the McKean complex are presented. Also discussed is evidence of a developmental link between the McKean complex and the succeeding Pelican Lake and Avonlea prehistoric cultural entities. It is suggested here that McKean should be considered the initial phase of a cultural tradition.

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Several individuals have been instrumental in assisting with the development and completion of this thesis. Deserving first mention are John and Anna Brumley. Not only did the Brumley's graciously allow me to prepare this thesis using Ethos Consultants Inc.' office equipment and library, John generated the northwestern Plains map used in Figure 5, the frequency distribution graphs in Figure 16, and the temporal distribution of presently published McKean C-14 dates used in Figure 14. In addition, John provided the author access to his C-14 date database, supplied photographs of the Cactus Flower site, provided numerous suggestions pertaining to avenues of research and thesis format, and suggested revisions for the final draft. Anna entered the data for the tables used within the body of this text, proof read portions of the final draft and always willingly helped when a format problem arose.

Gene Munson, James Keyser, George Frison, Charles Swaim, Richard Reider and Jim Finnigan willingly supplied the author photographs and negatives of the primary sites and/or respective projectile point assemblages/collections analyzed herein. Dr. Keyser also provided the author with unpublished manuscripts of the 1980 and 1991 preliminary excavation results at Lightning Spring, and Gene Munson provided the author with reports concerning form and proposed function of hearth types, and results of excavations at 24RB1164.

Melanie Keisig and Charles Ramsay supplied information which helped me to anlayze the frequency of exotic items within McKean complex sites and within immediately preceding and succeeding cultural complexes.

I would also like to thank Marcella Sherfy, Dave Schwab, Mark Baumler and all at the Montana State Historic Preservation Office who gave me the opportunity to work in compliance and to access the "grey literature" from the State of Montana during the initial stages of my thesis research.

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1.0 INTRODUCTION

1.1 Introduction

Of all archaeological units identified in the northwestern Plains, few have generated as much confusion and debate as the McKean complex. When Richard Wheeler coined the term in 1952, he was referring to a lanceolate shaped projectile point with a base exhibiting varying degrees of concavity. Following his research at the Keyhole Reservoir in northeastern Wyoming, William Mulloy noted that two variations of the lanceolate point appeared throughout the identified McKean occupation level at the McKean site. The first variation of the McKean Lanceolate form was a, "...slight constriction of the base sides to form a scarcely perceptible stem defined by a slight shoulder. Sometimes this constriction takes a form of a slight lateral notch, which is to say that the proximal end of the base appears slightly expanded (Mulloy 1954 445)."

The second variation on the McKean Lanceolate form consisted of a "pronounced stem constriction and shoulders... [and a] proximal end [that] is sometimes slightly expanded (Mulloy 1954:445)". In describing additional attributes of the projectile points recovered from the lower occupation level of the McKean site, Mulloy observed the following:

> All variants have cross-sections usually lenticular, though frequently plano-convex with one side revealing the original flake surface. Blade edges are usually sharp and thin, varying from even and symmetrical to sinuously irregular, with frequent hinge fractures and flakes not usually extending beyond the blade midpoint. Sharp edges were produced principally by primary flaking and only infrequently has short, secondary, retouch been resorted to along edges. Basalar concavities are produced by short,

> longitudinal, flakes which sometimes considerably thin the proximal ends. Bases and stems or proximal blade edges on lanceolate points are sharp. There is no grinding or other intentional dulling (Mulloy 1954:445).

Mulloy (1954) believed that combined, the three point styles formed a "continuous range of variation of shapes". Wheeler (1954), on the other hand, decided that these variations of the McKean Lanceolate point were distinct types, and he labeled these forms Duncan and Hanna respectively.

As Syms (1969:3-5) pointed out, the confusion already brewing about the definition of the McKean complex was only intensified after excavations at the Powers-Yonkee bison kill site (24PR5). This site produced a series of previously unidentified projectile point styles that Bentzen (1962) suggested were also a variant of the McKean Lanceolate point. Later, a lanceolate projectile point form with slender side-notches (Mallory points) was recovered in association with McKean Lanceolate points from a bison kill (48CR304) in central Wyoming (Lobdell 1973). Prior to that find, similar side-notched points were recovered with McKean Lanceolate points at Signal Butte in western Nebraska (Strong 1935). A definition for the McKean complex, however, was probably most muddled by Husted and Edgar (n.d.) following excavations at Mummy Cave (48PK201) in northwestern Wyoming. In an effort to track Shoshoni origins and demographics through the archaeological record, Husted suggested that the McKean complex should encapsulate the previously recognized McKean variants (i.e., McKean Lanceolate, Duncan, Hanna, Powers-Yonkee, and Mallory) as well as Oxbow materials. The geographic boundaries of the northern Plains should also be overlooked so that McKean

would include morphologically similar projectile points from the Great Basin and the Columbia Plateau.

Continued research has led most Plains archaeologists to exclude Powers-Yonkee and Oxbow projectile point forms as characteristic of the McKean complex and to consider the three point styles frequently associated in archaeological context -- the McKean Lanceolate, the Duncan, and the Hanna projectile points -- as defining characteristics (Frison 1991).

Previously, McKean has been called a complex (Syms 1969), a phase (Joyes 1967; Lahren 1976; Quigg 1986), a tradition (Stallcop 1966), a focus (e.g., Larter and Whitsell focus: MacNeish 1958; MacNeish and Capes 1958), and a culture (e.g., Thunder Creek culture: Wettlaufer 1955; Lake Shore culture: Vickers 1949). The implications of most of these taxonomic groupings were not always clearly defined, thus adding to the chaos encompassing a definition of McKean. Attempts also have been made to subdivide McKean complex materials at a sub-regional level instead of the regional level that the broader terms noted above assume. For example, Brumley (1975) defined the Old Channel Lake subphase for the McKean complex materials at the Cactus Flower site. Although not defined as a distinct local entity of the McKean complex, Keyser and Davis (1984) and Munson (1990a) discuss the possibility of a local variant within the McKean complex as results of excavations at the Lightning Spring and 24RB1164 sites in northwestern South Dakota and southeastern Montana. That proposition was based on the presence of "flake endscrapers", and the absence of typical plano-convex endscrapers.

Temporally, the McKean complex is situated between terminal Paleo-Indian hunters and the introduction of the bow and arrow (ca. 7500 to 1900 years B.P.). This time span, in reference to the northern Plains, has been termed the Middle Prehistoric period by Mulloy (1954, 1958). Terms such as Meso-Indian period (Wormington and Forbis 1965), and Middle Archaic (Frison 1978) have also been used to identify the temporal position of the McKean complex.

The term "archaic", in the context of northern Plains archaeology, is usually taken to imply a foraging economy, thus the word focuses on the proposed subsistence strategy of Native American groups living on and near the Plains between approximately 7500 and 1900 years ago. As will be discussed in the following chapters of this thesis, it does appear that large scale and possibly communal bison kills, which occurred during the first 3500 years of human occupation of the northern Plains, were rarely attempted between approximately 7500 and 3000 years ago. In fact, there seems to be a paucity of even moderate size bison kills during that time span. In addition, the presence of milling stones and rock lined hearths within some McKean complex sites have been suggested as evidence substantiating the hypothesis of archaic (foraging) cultures on the northwestern Plains beginning by at least 5000 years ago (Frison 1991; Jennings 1957; Mulloy 1954). Frison (1991:21) attempted to justify the archaic culture hypothesis within at least the central and southern portions of the northwestern Plains by pointing out:

> There were few local spots rich enough in plant and animal resources to have supported a true hunting economy comparable to the Northern Plains [Alberta, Saskatchewan and northern Montana] but many more spots were

> relatively marginal and required close attention to gathered resources. As a result, the prehistoric adaptations of the Northwestern Plains fit into an Archaic way of life perhaps more so than that of Plains hunters who were traditionally regarded as more oriented economically toward procurement of large game animals, particularly bison.

More and more researchers are beginning to develop interpretive models (Brumley and Rennie 1993a; Keyser and Davis 1984; Metcalf 1987; Munson 1990a; Reeves 1983) that suggest within the northwestern Plains, small local variants of many of the identified complexes existed, and might be better dealt with as culture history models are developed within a particular sub-region.

For the purposes of this study, I have chosen to use the general framework of Reeves' (1983) culture history model, which is actually a modified version of Mulloy's (1958) earlier model. It is my opinion that the developmental characteristics identified by Reeves which link many of his defined phases still provide among the most substantive evidence we have to discuss cultural continuity and change in the northern Plains. With any culture history model, however, as archaeological exploration increases and radiocarbon dates and comparative data become more available, the model stands to be revised or abandoned. Presently, however, Reeves' (1983) scheme appears to provide a good framework for organizing the presently defined archaeologically complexes within the northern Plains. Perhaps most important to this writer is that the model appears to place emphasis on technological attributes associated with each complex.

1.2 Objectives of the Proposed Study

This study focusses on a group of temporally distinct northwestern Plains artifact assemblages that are representative of a prehistoric cultural entity known as the McKean complex. Two major hypotheses have been proposed to explain variability among McKean complex artifact assemblages. The first theory assumes that Duncan, Hanna, and McKean Lanceolate points were manufactured and used contemporaneously by members of a single culture (Mulloy 1954). The second theory suggests each projectile point form was associated with a distinct archaeological unit (Syms 1969:171). Using the terminology of Reeves (1983), in the case of the first model, McKean assemblages would be viewed as a single archaeological complex or, if a developmental link between the McKean complex and preceding or succeeding complexes can be demonstrated, a phase within a cultural tradition. The second theory suggests that the Duncan, Hanna, and McKean Lanceolate point forms are best viewed as artifacts manufactured by members of three distinct archaeological complexes, and artifact assemblages containing each point form should be classified as indicating a distinct complex or phase of the same or different cultural traditions.

This study primarily synthesizes select data recovered with excavations at six northwestern Plains sites containing McKean complex projectile points. Data selected from the full range of known McKean sites is, however, used to a lesser extent. In analyzing the data, I intend to:

1) determine differences in the kinds and quantities of cultural materials, and features among McKean complex components.

2) examine if the artifact assemblage and activities interpreted within each McKean complex component suggest a subsistence economy different from preceding, contemporaneous, and succeeding cultural complexes.

3) examine the evidence regarding mortuary practices of McKean complex peoples, and compare and contrast that evidence with similar evidence from preceding, contemporaneous, and succeeding cultural complexes.

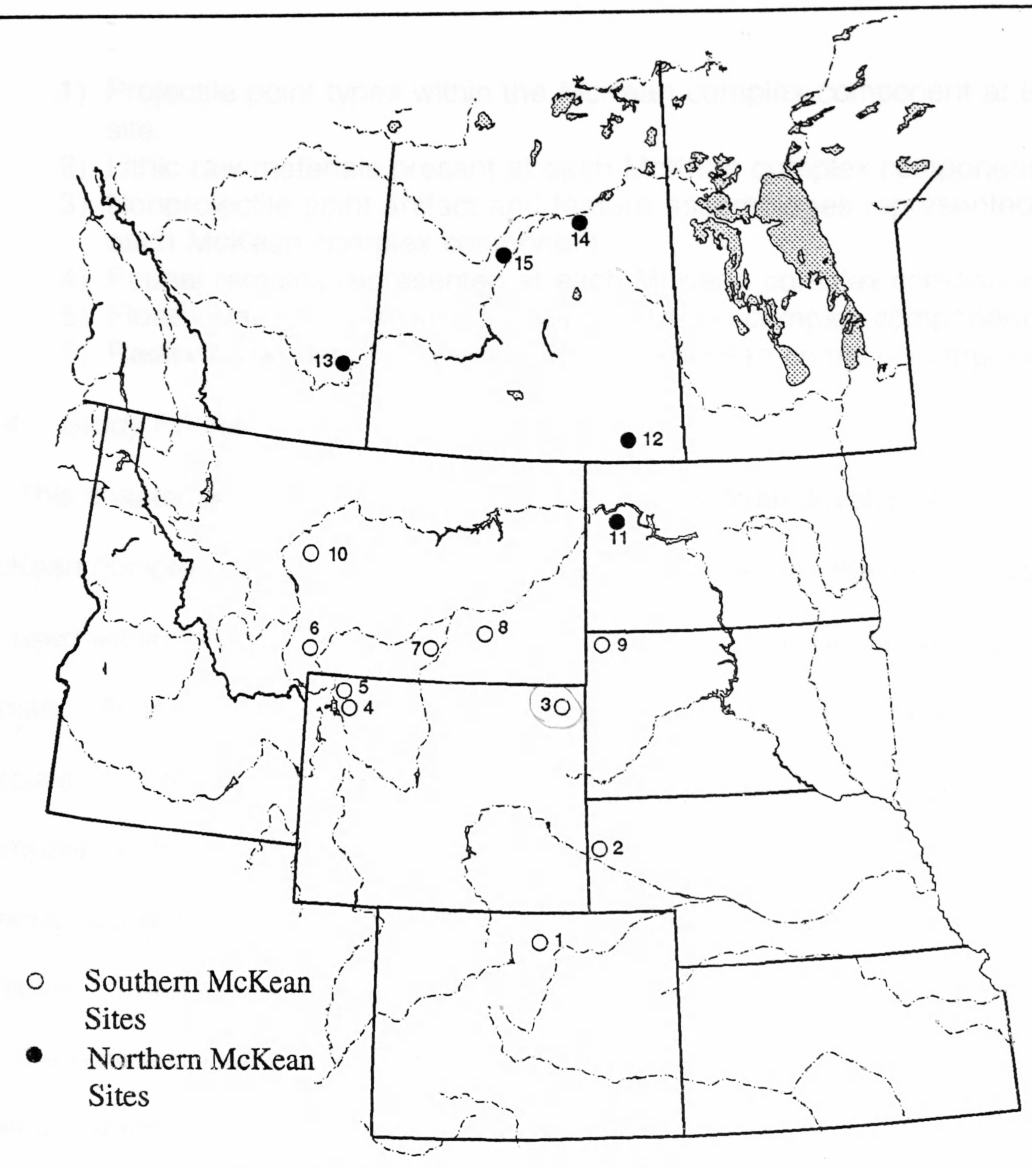
4) analyze the frequency with which projectile point forms characteristic of the McKean complex occur together; and discuss the degree of variation among the projectile point assemblages recovered from the McKean complex component at six sites.

5) evaluate whether the archaeological assemblages characterized by McKean Lanceolate, Duncan, and Hanna points should be considered a single archaeological unit or does the available evidence suggest three distinct archaeological units are represented.

The six McKean complex sites (Figure 1) to be analyzed in detail are: the McKean site (Mulloy 1954; Kornfeld and Frison 1985) and the Dead Indian Creek site (Frison and Walker 1984), both in northern Wyoming; the Lightning Spring site in northwestern South Dakota (Keyser and Davis 1984, 1985; Keyser and Wettstaed 1991); 24RB1164 in southeastern Montana (Munson 1990a), the Cactus Flower site in southeastern Alberta (Brumley 1975); and the Crown site in eastcentral Saskatchewan (Quigg 1986).

1.3 Methods

In order to achieve the previously outlined objectives I will analyze the following from the excavation reports of the six primary sites, and when appropriate, other sites containing a McKean complex component:



Map Ref. No.	Site Number	Site Name	Map Ref. No.	Site Number	Site Name
1	5BL120	Fourth of July Valley	8	24RB1225	Dodge
2	?	Signal Butte	9	39HN204	Lightning Spring*
3	48CK7	McKean*	10	24ME1002	DesRosier
4	48PA201	Mummy Cave	11	32MZ58	Mondrian Tree
5	48PA551	Dead Indian Creek*	12	EcNl-1	Mortlach
6	24PA504	Myers-Hindman	13	EbOp-16	Cactus Flower*
7	24RB1164	-- *	14	FhNa-86	Crown*
			15	FbNp-10	Redtail

**- indicates sites examined in detail herein.*

-- indicates no name was assigned to site

Adapted from Brumley and Rennie 1993a

Figure 1: Map showing distribution of select McKean sites on the northwestern Plains.

1) Projectile point types within the McKean complex component at each site.
2) Lithic raw materials present at each McKean complex component.
3) Nonprojectile point artifact and feature assemblages represented in each McKean complex component.
4) Faunal remains represented at each McKean complex component.
5) Floral remains represented at each McKean complex component.
6) Radiocarbon data obtained from each McKean complex component.

1.4 Study Format

This chapter provides an introduction to the conceptual development of the McKean complex, outlines the thesis objectives, and defines the terminology to be used within this text. Chapter 2 summarizes the environmental setting and climatic information of the study area. Chapters 3 through 8 provide a discussion of the six archaeological sites analyzed in detail. Chapter 9 compares and contrasts available information regarding mortuary practices among peoples using Oxbow, McKean, and Pelican Lake technologies. Chapter 10 provides a discussion of radiocarbon data for several McKean sites on the northern Plains, and considers previous models regarding origins, as well as recent evidence for origins of the McKean complex. The Summary and Discussion provided in Chapter 13 is intended to be a critical analysis of the available evidence as it applies to the McKean complex specifically and to a cultural historical sequence of the northwestern Plains in general.

Because certain information utilized in the tables was not always available within the various site reports examined, some columns could not be completed. When this occurred, a dashed line was placed in the appropriate row of the column to indicate insufficient data. It also was generally not possible

to obtain metric data for the artifact categories presented in the site reports. Due to this general lack of data for nonprojectile point artifacts, these items are summarized by quantity and material type only. Although a detailed analysis of six archaeological sites is admittedly a small sample, it is the writer's opinion that these sites contain enough information to characterize basic similarities and differences among McKean sites.

1.5 Relevance of This Study to Plains Prehistory

Why has projectile point analysis become the central focus of archaeologists working in the northwestern Plains? Have we not studied associated artifacts to determine if a change in culture can be detected? One of the biggest problems facing archaeologists is that organic materials usually are not preserved in the archaeological record. This leaves the archaeologist with rather limited data on prehistoric peoples' technology and subsistence base. Thus, the recognizable technological attributes that are available to the archaeologist for the study of Plains prehistory are largely stone artifacts. Pottery occurs by the later portion of the Middle Prehistoric period and adds an important element to identifying cultural influences and/or movements of prehistoric peoples in the northern Plains. In fact, pottery types have become more important within the northern Plains than projectile point styles for discussing distributions of cultural influences. Prior to the introduction of pottery to the archaeological record of the northern Plains, however, the only demonstrated change in the artifact assemblage, from one temporally distinct site or stratum to the next, is with the projectile points (Frison 1991; Heizer and

Hester 1978; Husted and Edgar n.d.; Lahren 1976; Mulloy 1958). The kinds and quantities of artifacts in the remaining assemblage often appear virtually unchanged. A bifacially flaked cutting or scraping implement from a site dating to 12,000 years old may appear to be indistinguishable from similar implements from a site dating back 200 years -- at least with our current methods of analysis for flaked stone tools.

Analysis of spatial distributions of features from temporally distinct activity floors has only recently become a focus of serious study (Munson and Herbort 1985), and may pose a great deal of potential for identifying cultural and temporal changes in activity patterning among prehistoric sites -- at least within certain geographic contexts.

Excavations at stratified and/or datable sites in the northern Plains have led many archaeologists to suggest that identifiable forms of projectile points tend to cluster on the time scale, and the assumption commonly is that each change in point morphology can be attributed to a change in culture (Frison 1991; Heizer and Hester 1978; Husted and Edgar n.d.; Reeves 1983). Considering the technological uniformity among prehistoric cultures in the northern Plains, if stylistic change in projectile points reflect a qualitative change in the representative culture, the change likely resulted from:

1) an in situ development where the group or groups using a certain projectile point form adapted a new technology or changed their adaptive strategy, and consequently their social organization; or

2) the group(s) using a certain projectile point form being displaced or assimilated by an intrusive group(s) using a different projectile point form.

An alternative explanation could be, of course, that point types changed randomly without a qualitative change in the cultural system.

1.6 Definitions of Select Cultural Material, Feature, and Archaeological Unit Categories

Several terms, especially those relating to artifact and feature types, are used throughout the text and need to be defined here in an attempt to limit the amount of ambiguity that might otherwise be inflicted upon the reader. The definitions have been organized in glossary format for convenient reference.

ASSEMBLAGE. All cultural material and/or features within a site which are believed to represent the activities of the people(s) of a single cultural complex or phase.

BIFACE. An artifact that exhibits intentional, and generally similar, flake removal from both surfaces such that flake removal has resulted in moderate to complete modification of the preform. Bifaces can range in form from an artifact possessing a fine cutting edge to an implement with an edge of no cutting ability and the category can and does incorporate recognized, finished artifacts such as projectile points, hafted knives, drills and some classes of end scrapers. The category biface will be restricted here to bifacially flaked artifacts which may represent cutting, chopping or scraping implements, but more likely represent preforms of the previously mentioned artifact classes and are not likely to have been designed as specialized tools. Although many of the site reports, from which the data was collected, listed bifaces in subclasses based on the stage of production (i.e. primary, secondary or tertiary reduction stages), bifaces are lumped together throughout this text with disregard to production stage of the artifact.

COMPLEX. Clarke (1978:489) defines a complex as, "a recurrent configuration of elements or entities within a larger system ." Within the northern Plains, that recurrent configuration has largely been identified as diagnostic projectile points and ceramics.

COMPONENT. All occupation surfaces and corresponding artifacts and features in a single site which represent the same cultural complex, phase or period.

CORE. " ... pieces of stone utilized for the production of flakes in chipped

stone tool production. Cores subsequently used as implements (choppers) are referred to as core tools (Brumley 1981)."

CULTURE. When used in the sense of a cultural complex, cultural tradition, or archaeological culture the term will be defined as a group of artifact assemblages which are believed to represent the activities of a group or groups of individuals somehow affiliated, but not necessarily through ethnic ties.

DRILL. A small, generally bifacial flaked tool whose form is interpreted to suggest that it was originally designed for boring holes in a variety of materials.

ENDSCRAPERS. Implements that most probably were designed for scraping or planing purposes and which may or may not have originally been hafted. As defined by Brumley (1981), "Endscrapers in their basic form consist of a steep, uniformly retouched working edge located at one end of the specimen and convex in plan view". Although generally classified as a specialized uniface, occasionally endscrapers will exhibit flaking along both sides of the lateral edges, thereby forming and artifact classifiable as a biface. Endscrapers are believed to have been primarily used in removing flesh, fat and membranous tissue from the inner surface of green hides.

FIRECRACKED ROCK (FCR). Stones which, through cultural manipulation, fractured as a result of having been heated or heated and rapidly cooled. The following discussion of FCR is taken directly from Brumley (n.d.). Brumley recognizes three distinctive fracture patterns which characterize FCR. The first type is water fracture, which is characterized by hackly or jagged undulating fracture surfaces. This type of FCR is generally interpreted as resulting from stone boiling where heated stones shatter after being immersed in water. The second type is heat spalled, which is characterized by concave or convex surfaces, superficially resembling flake or core surfaces. This fracture pattern is generally interpreted as resulting from stones heated more on one surface than another. Stones where one surface is next to a hearth are commonly characterized by this fracture pattern. The third fracture pattern is bedding fracture, characterized by fracture surfaces that follow bedding planes or pre-existing faults or fractures in stone. Bedding fracture is largely dependant on the nature of the stone and may result under either set of conditions that create the other two fracture types.

GRAVERS. Similar to marginally retouched stone tools except that the flaking has been directed to produce a small spur or point probably for the purpose of incising another object.

HAMMERSTONE. An implement usually of hard, igneous or metamorphosed material exhibiting evidence of battering on at least one surface.

MANOS. Cobbles or slabs of igneous, metamorphic or sedimentary lithic material which are commonly identified as the hand held portion of a two piece grinding system. Manos tend to exhibit smoothing on at least one surface and usually not on the edges.

MARGINALLY RETOUCHED STONE TOOLS (MRST). "...chipped stone tools characterized by marginal primary flaking present along one or more edges. Flaking is generally limited and has not resulted in major modification to the shape of the preform upon which it is produced (Brumley 1981)." Included within the category of MRST are what other researchers have designated as utilized or retouched flakes, and flake knives.

METATES. Like manos, metates can be cobbles or slabs of igneous, metamorphic or sedimentary lithic material. Metates are generally identified as the stationary or lower portion of a two piece grinding system. Similar to wear patterns identified for manos, smoothing is exhibited on at least one surface and occasionally the metate will exhibit a smoothed, concave surface resulting from differential wear. The presence of manos and metates within archaeological sites on the northern Plains is usually interpreted as reflecting plant processing activities (Frison 1991). It should be noted here that when the term grinding stone is used in the body of this text, manos and metates will be the artifacts of discussion to the exclusion of other forms of abrading stones.

PHASE. A cultural complex which can be linked to a succeeding and/or preceding complexes or phases to form a cultural tradition (Reeves 1983).

PIT HEARTHS. Excavated pits which contain no or limited quantities of stone, but exhibit evidence of firing. Generally these features are lumped into a single category of basin shaped hearths, but in cross section these features may not be true basin shaped, using Fredlund's et al. (1983) criteria. For this reason, all excavated pit hearths that contain little or no stone are considered here pit hearths.

PROJECTILE POINT. A projectile point has been defined as, "...a pointed man-made object of stone, bone, shell, wood, or metal that can be hafted to a shaft [of a projectile] to facilitate penetration (MacNeish 1958:85)."

ROASTING PITS. Excavated pits which generally contain a fill of ash and/or charcoal and show no evidences of firing along the walls of the feature.

ROCK FILLED HEARTH. An excavated pit into which a significant quantity of stone has been dumped. Fire reddened soil around the perimeter of the hearth is often apparent. These features are also commonly referred to as roasting platforms.

ROCK LINED HEARTH. Similar in design to stone filled hearths with the exception that the rocks inside of the excavated pit have been arranged in a patterned manner along the bottom and especially along the sides of the pit to form a lining. Fire reddening of the soil along the pit walls is the necessary factor in determining these structures to be hearths.

SPOKESHAVES. Unifacially or bifacially flaked implements that can be either hafted or unhafted. Their distinguishing feature is a deep, semi-circular notch or working edge. Spokeshaves are believed to have been used to scrape rounded items of wood and bone.

SURFACE HEARTH. Generally identified by discoloration of the soil which attests to localized firing on top of a previous ground surface. Little or no preparation of the ground surface prior to heating is the distinguishing attribute of a surface hearth.

TRADITION. Following Reeves (1983), " A cultural tradition consists of persistent configurations in cultural systems that link cultural complexes through time."

UNIFACE. A flake or other chipped stone artifact that exhibits controlled, and intentional flake removal from only one surface along the same section of an edge thereby altering the general shape of the preform. Side scrapers and flake knives are included in the uniface category. Endscrapers are considered here to be a specialized form of uniface which I have categorized separately.

Few of the site reports used for this study contained clear definitions of each artifact category, (e.g., biface, uniface, chopper), therefore some degree of uncertainty exists for the quantities of each class of nonprojectile point artifacts as they are presented within the summary tables for the six primary sites analyzed in this thesis. In most cases, however, photographs or detailed sketches of some of the recovered artifacts were provided within the site reports. After reviewing those artifact illustrations it is my belief that the definitions provided earlier in this subsection accurately reflect how each of the excavators classified the recovered artifacts.

2.0 ENVIRONMENT

2.1 *Geographic Setting*

The primary area of study for this culture history project is the northwestern Plains. Following Reeves' (1983:25) definition of the northern Plains and its constituents, and Mulloy's (1958:8-13) earlier discussion of the northwestern Plains, the northwestern Plains may be adequately identified as that regional sub-area comprising the grasslands of present day Alberta, Saskatchewan, Montana, Wyoming; the western halves of North Dakota, South Dakota, and Nebraska; and the northern extreme of Colorado. The northwestern Plains are bounded on the north by the fifty-second parallel; on the west by the Rocky Mountains; on the east by the drainage basins of the Yellowstone River and upper Missouri River; and on the south by the Platte River drainage system. The northwestern Plains comprise a portion of massive alluvial slope which spreads eastward from the Rockies to the central lowlands, and ranges in elevation from 6000 to approximately 1500 feet (ca. 1829-457 meters). Within this short prairie grassland environment are several small, yet distinct, ecotones which provide a variety of plant, animal, lithic, and mineral resources (Wettstaed 1990:49-56). Although water resources such as free flowing springs and lakes are scarce on the characteristically arid northwestern Plains, the major drainage channels provide an abundance of water locally, and large, medium and small aggrarious herbivores such as bison, elk and pronghorn were once plentiful.

2.2 *Climate*

The climate can be characterized as that of mid-lattitude steppe. Summer

temperatures have been reported to reach highs of 47.2° C (117° F), while the low temperatures for winter months can fall to -45.5° C (-50° F) or lower. These extremes in temperature, however, are usually brief and the mean number of days during the summer months with a temperature of 32.2° C (90° F) or greater is as few as five in southcentral Montana and as many as 30 in southwest Nebraska. In contrast, the mean number of days during which temperatures can be expected to fall below 0° C (32° F) are 180.

Precipitation for the northwestern Plains has an overall average range of from 25.4 -30.5 centimeters (10-12 inches) annually with normal yearly precipitation rates for some weather zones being as high as 44.5 cm (17.5 in) and other zones receiving slightly less than 20.3 cm (8 in). Winter months tend to be cold and dry with the mean snowfall throughout the northwestern Plains being 91.4 cm (36 in). Intermittent spells of intensely cold weather are ameliorated along the eastern slope of the Rocky Mountains, from the upper Yellowstone valley near Billings, Montana to central Alberta, by what are known as Chinook winds. Such meteorologic phenomena drive temperatures well above freezing and may persist uninterrupted for several days. The months from April to September receive the majority of precipitation in the form of rain, with May and June being the months of heaviest rainfall. Characteristic weather systems which affect the northwestern Plains are short lived, intense storms that tend to be localized (Cunningham 1982; Brown 1947; United States Department of Commerce 1968).

3.0 THE McKEAN SITE

3.1 General Site Setting

Situated in northeastern Wyoming at the Keyhole Reservoir (Figure 2), the McKean site was located in 1951 by archaeologist William Mulloy during salvage excavations within the Belle Fourche River drainage sponsored by the Smithsonian Institution, River Basin Surveys Program.

Figure 2: General setting of the McKean site (48CK7). Photo courtesy of Richard Reider.

Initial excavation at the site took place in the summers of 1951 and 1952 by the University of Wyoming (Mulloy 1954). This series of excavations at the McKean site recovered numerous artifacts, chipped stone and bone debitage, and exposed numerous hearths, and a human burial. The site was

reinvestigated by the University of Wyoming in 1983, at which time a second burial was discovered and a better understanding of the cultural and natural stratigraphy within the site was obtained.

After examining the soil profile within the McKean site during the 1951 and 1952 excavations Mulloy suggested that two distinct cultural strata were present. This assumption was based on the presence of two separate darkly stained lenses which Mulloy (1954:436-437) felt had resulted from charcoal and other organics being mixed into these strata. The cultural stratum closest to the surface represented cultural activities at the site during the later portion of the Middle Prehistoric period. A stratum of sterile soil separated this level from the oldest cultural level of the site. The oldest cultural stratum represented activities of peoples using a McKean complex technology.

Following excavation and analysis of the data collected from the McKean site Mulloy (1954:440-441) suggested that the two distinct cultural strata were most likely the result of multiple occupation sequences, and as such, individual occupation episodes could not be isolated within either stratum. The co-occurence of Duncan, Hanna, and McKean Lanceolate projectile points from the lower occupation level, thus came to represent the McKean complex (Kornfeld and Frison 1985:33).

Investigations at the site in 1983 led Kornfeld and Frison to suggest that the geomorphological processes which have operated to form the site were more complex than Mulloy originally believed.

...cultural deposition seems to be continuous rather than restricted to two

> distinct cultural horizons. The density of cultural material is considerably greater in the McKean layer and slightly greater in the upper layer, but this is expected since these layers are soils which formed the ground surface for a longer period of time than their associated [separating] "C" horizons (Kornfeld and Frison 1985:39).

The final interpretation of the soil profile at the McKean site was that soil development, in general, was slow but continuous. Further, cultural debris is present throughout approximately 1.5 meters of sediment and not isolated to two discrete cultural strata as suggested by Mulloy.

3.2 Discussion of Artifacts and Features

Although total area of controlled excavation was not clearly presented in either Mulloy's (1954) or Kornfeld and Frison's (1985) reports, a plan drawing of subsurface examination locales within the McKean site (Albanese 1985:64) suggests that an area of no less than 370 square meters has been excavated by controlled or moderately controlled means.

A fairly large collection of chipped stone artifacts was recovered from the McKean site, but variation in the overall collection was minimal. Mulloy's lower cultural stratum produced 115 partial and complete projectile points. Forty three are of quartzite, and 48 are of metamorphosed siltstone -- both locally obtainable materials (Mulloy 1954:444-445). Additional information concerning lithic raw materials used in manufacturing the remaining 24 points, as well as general metric data, were not readily available. Similarly, I was unable to obtain metric and nonmetric data for three McKean complex projectile points recovered from Mulloy's lower cultural stratum during Kornfeld and Frison's 1983 investigations of the site. Further, metric and nonmetric observations of

the remaining artifacts and features recovered or exposed during the 1983 investigations were not presented within the general report. For that reason, only the metric and nonmetric data on the artifacts and features presented by Mulloy (1954) are used in the summary tables of this chapter.

Figure 3 is adapted from Mulloy's (1954) article on the McKean site and provides a visual representation of the range in projectile point styles recovered from Mulloy's two distinct cultural strata. A definite change in projectile point morphology can be seen between Mulloy's upper and lower cultural strata. However, due to the lack of intact, stratified deposits within Mulloy's upper and lower cultural strata at the McKean site, it was not possible to determine if all three point forms (McKean Lanceolate, Duncan, and Hanna) occur with equal frequency during McKean complex times, or if one point form dominates over the others at a specific time. The 1983 investigations of Mulloy's lower cultural stratum were equally inconclusive as that series of excavations recovered a Duncan, a Hanna and a McKean Lanceolate point, but "...one of the points was in a krotovina and another was not found in place, thus only one of the three was in a controlled stratigraphic position (Kornfeld and Frison 1985:42)". At the very least, the illustrated morphological organization of projectile points from Mulloy's lower cultural level, in Figure 3, provides an accurate visual of Wheeler's definitions of the McKean Lanceolate, Duncan, and Hanna point forms respectively from top to bottom row.

The antler, bone, and shell artifact inventory from the McKean complex component of the McKean site is extremely limited and consists of a single

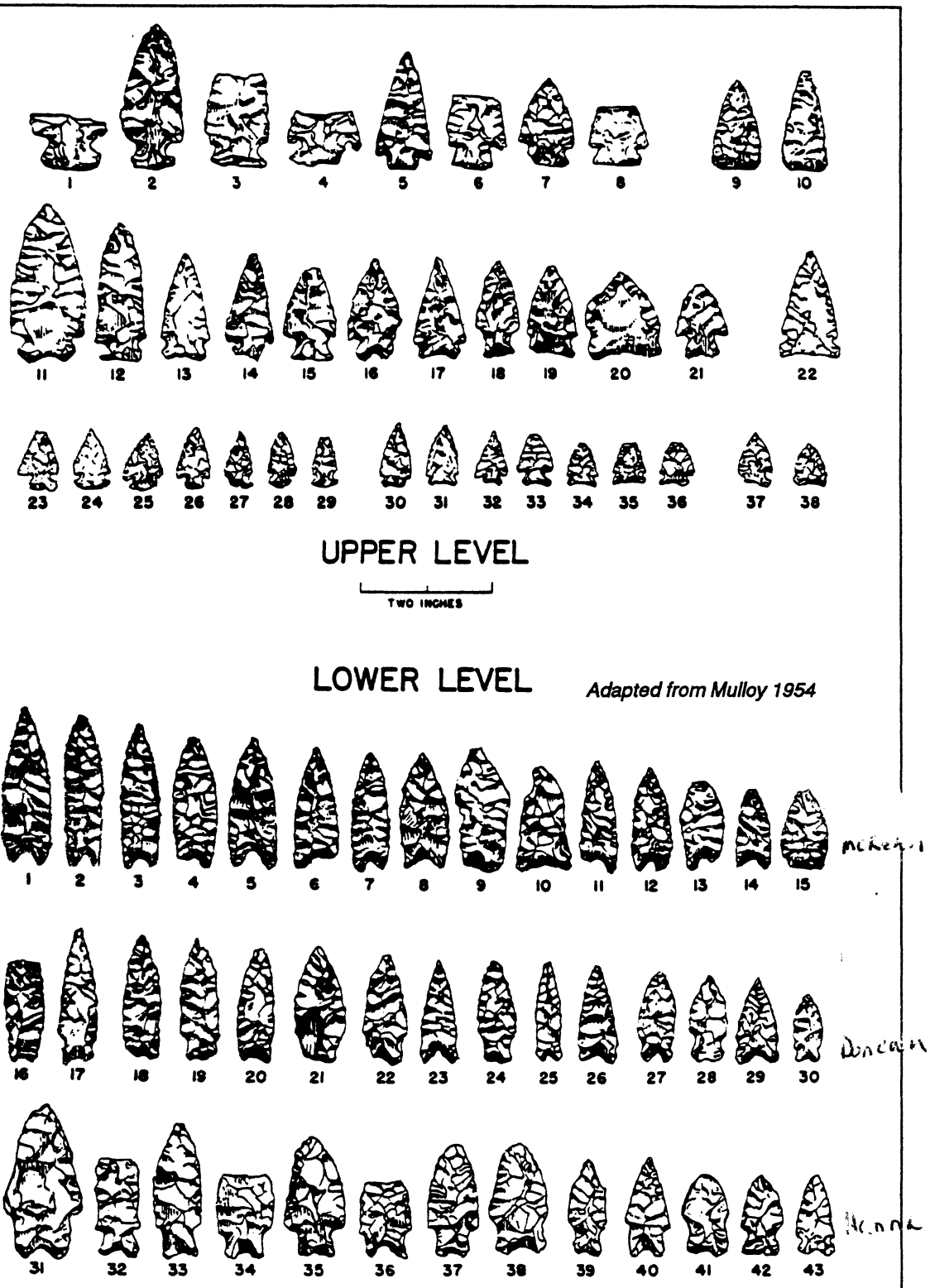


Figure 3: Projectile points recovered from Mulloy's upper and lower cultural occupation units at the McKean site.

unidentifiable bone tool fragment and three bone beads (Mulloy 1954:449). Those artifacts are summarized in Table 1. The nonprojectile point stone artifacts (Table 2) relate to food preparation, implement production, and other general maintenance and domestic activities. Materials selected for stone artifact manufacture demonstrate heavy reliance on locally available materials (Mulloy 1954:443-449). Of interest are the numerous MRST and projectile points of quartzite, and a total absence of quartzite cores and bifaces. This pattern suggests that quartzite tools were manufactured away from the McKean site and imported to the site as largely or completely finished implements.

Although grinding stones (Table 3) were recovered from Mulloy's lower cultural stratum at the McKean site during the 1952 excavations, Mulloy (1954:449) remarked that those from the lower occupation level were not so numerous as in the upper occupation level. The length of only one grinding slab was provided by Mulloy, and average thickness, based on measurements of three grinding slabs, is 1.7 centimeters (cm).

Table 4 summarizes the heating/cooking facility data derived from Mulloy's lower cultural unit. Surface hearths, prepared sandstone slab lined hearths, and prepared rock filled hearths were present, but information regarding spatial patterning of these features was not available. Of the 33 hearths, 19 are surface hearths, 12 are slab lined, and 2 are rock filled hearths (Mulloy 1954:441-444).

In addition to the rich and varied collection of artifacts and features, two human burials were exposed within the McKean complex component. The first

Table 1: Summary by number and type of antler, bone and shell artifacts recovered from the McKean complex component at the McKean site.

Bone Awl	Blunt Ended Bone Tools	Unidentified Bone Tool Fragments	Bone Beads	Antler Tools	Shell (#)	Artifacts (Type)
0	0	1	3	0	0	

Data obtained from Mulloy (1954:449)

Table 2: Summary by number and material type of select stone artifacts recovered from the McKean complex component at the McKean site.

Tool Category	Raw Material Categories: Slstn	KRF	Ccs	Sw	Mslstn	Porcelanite	Quartzite	Quartz	Argillite	Ignimbrite	Basalt	Obsidian	Sandstone	Felsic lava	Limestone	Diatomite	Granite	Mica schist	Indeterminate
Bifaces					43														
MRST			1		29		72												33
Endscrapers			10	2	1		5												
Spokeshaves					5														
Gravers																			
Cores					26														
Core tools																			
Drills																			
Hammerstones																			
Grinding stones													8						
Unifaces					12														
Projectile points					48		43												

Abbreviations:

Material Type: Slstn = Silicified siltstone; KRF = Knife River flint; Ccs = Cryptocrystalline silicate; Sw = Silicified wood; Mslstn = Metamorphosed siltstone.

Tool Type: MRST = Marginally Retouched Stone Tool

Data obtained from Mulloy (1954:443-449)

Table 3: Metric and nonmetric observations on grinding stones recovered from the McKean complex component at the McKean site.

Length (cm)	Thickness (cm)	Material	Type
43.2	2.3	Sandstone	Metate
--	0.7	Sandstone	Metate
--	2.3	Sandstone	Metate
--	--	Sandstone	Metate
--	--	Sandstone	Metate
--	--	Sandstone	Metate
--	--	Sandstone	Mano
--	--	Sandstone	Mano

Data obtained from Mulloy (1954:449)

Table 4: Heating/cooking facility and excavated pit data from the McKean complex component at the McKean site.

Surface Shape	Profile Shape	Stone Filled/ Lined	Fracture Pattern of Stones	Surface Diameter (cm)	Pit Depth (cm)	FILL		
						Faunal Remains	Flakes or Artifacts	Ash or Charcoal
Irregular	Surface			15.2		--	--	--
Irregular	Surface			57.9		--	--	--
Irregular	Surface			--		--	--	--
Irregular	Surface			--		--	--	--
Irregular	Surface			--		--	--	--
Irregular	Surface			--		--	--	--
Irregular	Surface			--		--	--	--
Irregular	Surface			--		--	--	--
Irregular	Surface			--		--	--	--
Irregular	Surface			--		--	--	--
Irregular	Surface			--		--	--	--
Irregular	Surface			--		--	--	--
Irregular	Surface			--		--	--	--
Irregular	Surface			--		--	--	--
Irregular	Surface			--		--	--	--
Irregular	Surface			--		--	--	--
Irregular	Surface			--		--	--	--
Irregular	Surface			--		--	--	--
Irregular	Surface			--		--	--	--
Irregular	Surface			--		--	--	--
Ovoid	Basin	Lined	--	24.4	12.2	--	--	Ash & charcoal
Ovoid	Basin	Lined	--	79.2	24.4	--	--	Ash & charcoal
Ovoid	Basin	Lined	--	--	--	--	--	Ash & charcoal
Ovoid	Basin	Lined	--	--	--	--	--	Ash & charcoal
Ovoid	Basin	Lined	--	--	--	--	--	Ash & charcoal

Table 4: Continued

Surface Shape	Profile Shape	Stone Filled/ Lined	Fracture Pattern of Stones	Surface Diameter (cm)	Feature Depth (cm)	FILL		
						Faunal Remains	Flakes or Artifacts	Ash or Charcoal
Ovoid	Basin	Lined	--	--	--	--	--	Ash & charcoal
Ovoid	Basin	Lined	--	--	--	--	--	Ash & charcoal
Ovoid	Basin	Lined	--	--	--	--	--	Ash & charcoal
Ovoid	Basin	Lined	--	--	--	--	--	Ash & charcoal
Ovoid	Basin	Lined	--	--	--	--	--	Ash & charcoal
Ovoid	Basin	LIned	--	--	--	--	--	Ash & charcoal
Ovoid	Basin	Lined	--	--	--	--	--	Ash & charcoal
Circular	Basin	Filled	--	97.5	57.9	--	--	Ash & charcoal
Circular	Basin	Filled	--	97.5	61.0	--	--	Ash & charcoal

Data obtained from Mulloy (1954:441-444)

burial was located in 1951 and the second burial, situated approximately five meters from the first, was exposed during the 1983 excavations (Haspel and Wedel 1985:105-108; Mulloy 1954:442). Each burial, interpreted as secondary in nature, took place inside shallowly excavated pits within the McKean occupation floors. In Chapter 9 of this thesis, both burials are discussed in detail and compared to mortuary practices of other selected archaeologically-defined entities in the northern Plains.

3.3 Macrofloral Analysis

A study of the carbonized wood from the McKean component recovered during the 1983 excavations indicated that *Pinus ponderosa* (ponderosa pine) and *Juniperus sp.* (juniper) were the chief fuels. *Artemisia cana* (sagebrush) was lacking even though sagebrush currently is abundant near the McKean site (Lataday and Dueholm 1984:84).

Data collected in 1983 through flotation analysis of soil samples obtained from hearth fills and activity floors of the McKean complex unit in the McKean site are presented in Table 5. All seeds came from plants believed to have been utilized as foodstuffs by prehistoric peoples. The infrequent presence of edible seeds, however, is suggested here to provide little support to the suggestion that the McKean complex group(s) that occupied the site were involved in intensive or even moderate levels of plant and seed processing. It should be kept in mind, of course, that seeds not carbonized, and the more perishable portions of edible plants, would not have been preserved in the slowly developed soils which contain the McKean complex component.

Table 5: Summary of macrofloral remains recovered from the McKean complex component at the McKean site.

Scientific Name	Common Name	Number of Elements
Opuntia polyacantha	prickly pear cactus	2 areoles
Pinus ponderosa	ponderosa pine	10 immature seeds
Chenopodium sp.	--	2 seeds
Amalanchier alnifolia	serivce berry	1 seed
Crucifirae	mustard	1 seed

Data obtained from Lataday and Dueholm (1984:84)

3.4 Microfloral Analysis

Phytolith and pollen studies of soil samples from the McKean site tend to indicate a climate moister than at present. Supporting this claim is a higher percentage of panicoid (tall grass) phytoliths than chloridoid (short grass) phytoliths (Lewis 1985:48). Presently, short prairie grasses are the dominant vegetation type at the McKean site.

Of interest was the large size of the phytoliths obtained from the soil sample from the lower level of the McKean site. It has been proposed that phytolith size correlates to the amount of available water (Yeck and Gray:1972). The large size of phytoliths from the lower McKean site levels was originally suggested as representative of a body of standing water in the immediate vicinity of the site when the site was occupied by McKean complex peoples. Refuting this proposition, however, was an absence of aquatic plant and diatom remains which thrive in shallow, standing water. Considering the difficulties inherent in controlling for the ways phytoliths and pollens are introduced into the archaeological record in an open campsite setting, the results of Lewis' study may not accurately reflect paleoclimates in northeastern Wyoming (Foor pers. comm. 1994).

3.5 Faunal Remains

Information regarding faunal remains at the McKean site is limited to that provided in Mulloy's 1951-1952 excavations report. Skeletal elements were apparently plentiful, although badly deteriorated, and for the most part, unidentifiable as to genera. The minimum number of individuals by species, as

represented at the McKean complex component, was established based upon a limited number of identifiable skeletal elements. Therefore, the number of identifiable species recovered from the site, as summarized in Table 6, is misleading. The bone fragments recovered from the site led Mulloy (1954:453) to conclude that the McKean complex people(s) who occupied the site "were involved in heavy processing of faunal bones for purposes of marrow and grease extraction".

3.6 Chronometric Analysis

Mulloy's 1952 work at the McKean site produced a C-14 date of 3287 ± 600 radiocarbon years before present (1950 A.D.), or B.P. (Appendix: this volume). That date was one of the first obtained during the early years of radiocarbon analysis experiments. Since that time the C-14 half-life has been revised upwardly from the "Libby half-life" of 5568 ± 30 years (the half-life being used at the time Mulloy obtained his C-14 date) to the "Cambridge half-life" of 5730 ± 40. If Taylor's (1987:9) estimate of a 3% increase in the C-14 date values from the Libby to the Cambridge half-life determinations is accurate, a date of 3386 ± 618 B.P. might more accurately reflect the C-14 half-life from the charcoal sample Mulloy obtained in 1952. In 1983 when a University of Wyoming field crew conducted additional research work at the McKean site, three additional radiocarbon dates of 4590 ± 160 B.P., 3790 ± 140 B.P. and 1920 ± 120 B.P. (Appendix: this volume) were obtained. Charcoal samples from excavated hearths were used to produce Mulloy's (1954:456) original date, and Kornfeld and Frison's (1985:36) dates of 3790 ± 140 B.P. and 1920 ± 120 B.P. It is

Table 6: Summary of faunal remains recovered from the McKean complex component at the McKean site.

Scientific Name	Common Name	MNI
Bison bison	modern bison	1
Antilocapra americana	pronghorn	--
Odocoileus sp.	deer	--
Canis familiaris	domestic dog	1
Lepus sp.	rabbit	--
Aves class	bird	--
--	frog	1

Data obtained from Mulloy (1954:453)

unclear what organic materials were used to produce the date of 4590 ± 160 B.P., but it likely was also a charcoal sample obtained from a hearth.

3.7 Summary

In 1952, excavations at the McKean site produced a series of projectile points thought to represent three major variants of a single form (Mulloy 1954:444). The point styles, in association with milling slabs, sandstone slab lined roasting pits, and a paucity of faunal remains, led Mulloy (1954:440) to propose that McKean complex peoples were broad spectrum hunters and gatherers who relied primarily on processing wild plant foods and hunting large and small game animals -- as opposed to their having a subsistence base focused primarily on big game.

The paucity of animal bones recovered at the McKean site could imply that plant processing was of primary importance when seasonal migrants stopped at the site. Although little evidence from macrofloral analysis supports such a conclusion, it should be kept in mind that the relatively stable ground surfaces at McKean site would have provided a less than ideal preservation media for organic materials originally deposited on the ground surface. Additionally, the slowly (generally) developed soils identified in the site suggest the potential for continuous mixing of cultural materials over hundreds of years as more than one McKean complex group, or the same group repeatedly occupied the same ground surface.

4.0 THE DEAD INDIAN CREEK SITE

4.1 *General Site Setting*

Located on a terrace of Dead Indian Creek at an elevation of 1843 meters (6048 feet) above mean sea level in northwestern Wyoming, the site occupies a mid-altitude setting within the Rocky Mountain Front (Figure 4). Excavated intermittently from 1969 to 1972, the site was initially determined to be a multicomponent, prehistoric campsite with good separation among the various cultural components (Frison and Walker 1984:11-15). Information regarding the number of square meters excavated within the site was not presented within the corresponding report.

Figure 4: General setting of the Dead Indian Creek site (48PK551). The site is situated within the level terrace in foreground. Photo courtesy of George Frison.

4.2 *Discussion of Artifacts*

As a result of the excavations, 565 complete and fragmentary projectile points were recovered from what was defined as the Middle Archaic component. Most projectile points resembled either the McKean Lanceolate, the Duncan, or the Hanna forms. As Frison and Walker (1984:23) noted:

> Three basic variations, including lanceolate, stemmed, and side-notched points are present. However, intergrades between these three are also present. This would seem to suggest a range of variation around a single norm rather than three distinct types. Flaking varies from long, thin, parallel collateral flakes to almost nonpatterned flaking. Bilateral retouch of the blade edges by fine pressure flaking is also common. Throughout the assemblage, bases are concave or notched regardless of stylistic type.

Table 7 summarizes the metric and nonmetric data of the projectile points recovered in excavations at the Dead Indian Creek site. Figure 5 illustrates the range in variability among the projectile points recovered from the Middle Prehistoric period component. The majority of the projectile points are of cryptocrystalline silicates followed by quartzite. Of the 67 complete McKean Lanceolate points used in this analysis, the smallest is a mere 15 millimeters (mm) in length while the longest specimen measures 75 mm. The Duncan and Hanna specimens were not distinguished in the site report, and were instead combined within the category of "stemmed" and analyzed as a single entity. The shortest complete specimen of the 39 stemmed points used is approximately 20 mm whereas the longest of the stemmed points measures 44 mm. Mean length for stemmed and McKean Lanceolate points is about 30 mm, and mean width and thickness are 15 mm and 5 mm respectively.

Table 7: Metric and nonmetric observations on projectile points recovered from the Middle Prehistoric period component at the Dead Indian Creek site.

Type	Basal Shape	Raw Material	Length (mm)	Width (mm)	Thickness (mm)	Stem Length (mm)	Stem Width (mm)	Basal Width (mm)	Height of Notch (mm)	Blade Outline
L	CV	Ccs	46+	17	6			--		ST
L	CV	Ccs	30+	14	6			--		ST
L	N	Ccs	--	15	4.5			--		CX
L	CV	Ccs	24+	11	5			--		CX
L	N	Ccs	--	--	--			--		--
L	N	Ccs	--	--	--			--		--
L	CV	Ccs	44	33	7.5			--		CX
L	N	Ccs	--	--	--			--		CX
L	N	Ccs	75	24.5	7			--		CX
L	N	Qtzte	61	34	7			--		CX
L	CV	Ccs	--	--	--			--		--
L	ST	Ccs	73	26	6			--		CX
L	ST	Ccs	59	37	8			--		CX
L	CV	Ccs	55	36	7.5			--		CX
L	CV	Ccs	23	20	7			--		CX
L	CV	Shale	39	26.0	8			--		CX
L	CV	Ccs	32	27.0	7			--		CX
L	CV	Ccs	17	14.0	5			--		CX
L	CV	Sw	30	16	7			--		CX
L	CV	Ccs	26	27	8			--		CX
L	CV	Ccs	22	12.2	4.3			--		CX
L	CV	Ccs	30	12	5.5			--		CX
L	CV	Shale	28+	13	4			--		CX
L	N	Ccs	36	12	6			--		CV
L	--	Ccs	35+	12.5	4.5			--		CX
L	N	Ccs	35	15	5			--		ST
L	N	Ccs	31	12	5.5			--		CX
L	N	KRF	43.5	16	5			--		CX
L	N	Ccs	26.5	14	5			--		CX
L	N	Qtzte	28	14.5	6			--		CX
L	CV	Ccs	35	13	4.5			--		CX
L	N	Ccs	25+	15	5			--		CX
L	CV	Ccs	26.6	12+	4.2			--		CX
L	CV	Qtzte	26.5	12	5			--		CX
L	N	Ccs	23	16	4.5			--		CX
L	CV	Ccs	29	14.9	3.6			--		CX

Table 7: Continued

Type	Basal Shape	Raw Material	Length (mm)	Width (mm)	Thickness (mm)	Stem Length (mm)	Stem Width (mm)	Basal Width (mm)	Height of Notch (mm)	Blade Outline
L	CX	Ccs	25	10.8	5			--		CX
L	CV	Ccs	25.1	11	3.3			--		CX
L	CV	Ccs	22	13.3	5			--		CX
L	CV	Sw	24.1	11.9	3.9			--		CX
L	CV	Qtzte	26.5	13.6	5.4			--		CX
L	CV	Qtzte	21.7	12.7	5.2			--		CX
L	ST	Ccs	24.2	11.2	4.9			--		CX
L	CV	Bas	25	14.1	5			--		CX
L	--	Ccs	30	11	2.5			--		ST
L	CV	Ccs	20.2	12.3	4.9			--		CX
L	CV	Ccs	24+	13	5			--		CX
L	N	Ccs	28	12	4.8			--		CX
L	ST	Ccs	19	13.5	3			--		CX
L	CV	Ccs	24	14	5			--		CX
L	CV	Ccs	43.2	19	5.6			--		CX
L	N	Ccs	27	13	5			--		ST
L	CV	Sw	28.3	16.2	5.8			--		CX
L	CV	Ccs	20.3	13	3.6			--		CX
L	CV	Qtzte	22.7	12.2	5.8			--		CX
L	CV	Ccs	19	12.4	4.5			--		CX
L	CV	Ccs	32	14	5.5			--		CX
L	CV	Ccs	31.5	14.5	4.5			--		CX
L	CV	Ccs	41	14	5.5			--		CX
L	N	Ccs	32.5	--	6			--		CX
L	CV	Ccs	28+	17	7			--		CX
L	CV	Ccs	40+	16	6			--		CX
L	N	Ccs	25	13	6			--		CX
L	N	Ccs	23	12	4.5			--		CX
L	N	Ccs	33	18	5			--		CX
L	CV	Qtzte	30	16	5			--		CX
L	CV	Ccs	26	11	4.5			--		CX
L	--	Ccs	11.5	--	4.5			--		CX
L	N	Qtzte	48	27	8			--		CX
L	CV	Ccs	30	13	5.6			--		CX
L	CV	Ccs	39	14	5			--		CX
L	CV	Ccs	25	11	5			--		CX
L	CV	Ccs	22	11	4.5			--		CX

Table 7: Continued

Type	Basal Shape	Raw Material	Length (mm)	Width (mm)	Thickness (mm)	Stem Length (mm)	Stem Width (mm)	Basal Width (mm)	Height of Notch (mm)	Blade Outline
L	CV	Ccs	17+	12	4			--		CX
L	CV	Ccs	24	12	3			--		CX
L	N	Shale	20+	13	4.5			--		CX
L	--	Sw	37+	17	5			--		CX
L	CV	Ccs	30+	15	5.5			--		CX
L	N	Ccs	41.2	16.1	3.4			--		CX
L	CV	Shale	25+	16	4			--		CX
L	CV	Ccs	29+	19	4			--		CX
L	N	Ccs	33	14	5			--		ST
L	CV	Ccs	30	--	6			--		CX
L	CV	Qtzte	28	11	5.1			--		CX
L	CV	Ccs	29.8	14	5.7			--		CX
L	N	Sw	27	15	5			--		CX
L	CV	Qtzte	22.8	11.4	4.1			--		CX
N	N	Ccs	42.5	13	--	--	--	--	7.5	CX
N	CV	Ccs	22	15	4.5	--	--	--	7	ST
N	CV	Qtzte	24	13.5	4	--	--	--	7	CX
N	N	Ccs	34.5	19	5	--	--	--	8	CX
N	N	Ccs	23	10	4	--	--	--	7	CX
N	N	Ccs	24+	16	4	6	--	16	5	CX
N	N	Ccs	29.5	15.5	5	--	--	--	8	CX
N	CV	Ccs	41.5	15	5	--	--	--	9	CX
N	CV	Ccs	34.5	16.5	6	--	--	--	10	CX
N	N	Ccs	26.5	13	4.5	--	--	--	7	CX
N	N	Ccs	24.5	15	4.5	--	--	--	6	CX
N	N	Shale	26	15	4.5	--	--	--	6	CX
N	N	Ccs	37	19	4.5	--	--	--	10	CX
N	N	Ccs	19.5	15.3	3.8	--	--	--	6	ST
N	CV	Ccs	51.8	20.6	5	--	--	--	7	CX
N	N	Ccs	27.4	16.1	4.2	--	--	--	7.2	CX
N	N	Ccs	25.2	15.1	4.5	--	--	--	7.1	CX
N	N	Ccs	23	13.9	3	--	--	--	7.6	CX
N	CV	Ccs	25.3	18.3	4.2	--	--	--	10	CX
S	CV	Ccs	34.5	17	4	7.5	--	15		CX
S	CV	Ccs	28	14.5	5.50	1.1	--	--		CX
S	ST	Ccs	31+	13	5	6	--	10		ST
S	N	Ccs	--	--	--	22	--	21		--
S	CV	Ccs	38	16	5	8	--	10		CX

Table 7: Continued

Type	Basal Shape	Raw Material	Length (mm)	Width (mm)	Thickness (mm)	Stem Length (mm)	Stem Width (mm)	Basal Width (mm)	Height of Notch (mm)	Blade Outline
S	N	Qtzte	32	16.5	5.5	--	--	--		CX
S	CV	Ccs	24+	13.5	4	9	--	13		CX
S	N	Qtzte	23	16	3	12	--	12.5		CX
S	CV	Obs	21+	17	6	8	--	6		--
S	CV	Ccs	38.2	20.8	7.3	9	--	13		CX
S	CV	Ccs	39	17.7	6.2	9.5	--	16		CX
S	CV	Qtzte	23	12.4	5	7.2	--	14.3		CX
S	CV	Ccs	27.8	16.2	5.6	11.8	--	14		CX
S	N	Ccs	24+	16	4	17	--	15		CX
S	N	Ccs	41	15	4.4	8.2	--	18		CX
S	CV	Ig	38.5	16.5	10.5	13	--	11.5		CX
S	CV	Shale	34+	17	8	10	--	11		CX
S	CV	Qtzte	24+	13	6	10	--	8		CX
S	CV	Ccs	24.5	15	5.5	11	--	--		CX
S	CV	Ccs	25+	19	6	10	--	15		CX
S	CV	Qtzte	21+	17	5	10	--	15		CX
S	CV	Ccs	25+	17	5	8	--	13		CX
S	CV	Bas	18+	18	5	12	--	10	--	ST
S	--	Ccs	--	12	4	4	--	--	--	CX
S	N	Ccs	25	13	4	4	--	13	--	ST
S	CV	Qtzte	34+	18	6	12	--	11	--	ST
S	CV	Obs	21+	17	6	12	--	9.5	--	CX
S	CV	Qtzte	29	20	6	10.5	--	--	--	CX
S	CV	Bas	29	15	6	11	--	12.5	--	CX
S	N	Ccs	36	15	4	18	--	14.5	--	CX
S	N	Ccs	43.5	15.5	4.5	8	--	14.5	--	CX
S	N	Ccs	25	13	4.5	7	--	13	--	ST
S	CV	Ccs	25	14	6	9.5	--	11	--	CX
S	N	Ccs	44	17.5	5	7.5	--	15	--	CX
S	N	Ccs	25	13	4	6	--	--	--	CX
S	CV	Qtzte	31	16	5	12	--	10.5	--	CX
S	CV	Obs	25	19	7.5	13	--	12	--	CX
S	ST	Ccs	31.3	18	5	7.9	--	--	--	ST
S	N	Ccs	34.9	17	4.2	1	--	15	--	CX
S	N	Ccs	34	12.5	4.9	5.2	--	11.8	--	CX
S	N	Qtzte	30.3	12	4.3	7.8	--	11	--	CX
S	N	Ccs	28.3	14.2	4.2	6.5	--	12.9	--	CX
S	CV	Ig	28+	20	7	13.5	--	17	--	CX

Table 7: Continued

Type	Basal Shape	Raw Material	Length (mm)	Width (mm)	Thickness (mm)	Stem Length (mm)	Stem Width (mm)	Basal Width (mm)	Height of Notch (mm)	Blade Outline
S	CV	Ccs	27.9	13	4.6	6.5	--	12.5		CX
S	CV	Ccs	23.9	12.3	4.6	7.2	--	12		CX
S	N	Ccs	38.8	16.8	4.3	7	--	15.1		CX
S	CV	Ig	27	20	6.4	14.2	--	16.2		ST
S	CV	Ig	22.3	17	6.1	11	--	13.7		ST
S	CV	Ig	27.8	15.3	6.8	11	--	14.3		CX
S	CV	Qtzte	20.2	13	5	8.7	--	10.8		CX
S	N	Ccs	36.9	16.8	5	7.3	--	14.1		CX
S	CV	Bas	23	14.8	5	10.2	--	11.5		CX
S	N	Ccs	26.7	13.2	3.8	7.9	--	13.2		CX
S	CV	Obs	28.8	20	6	10	--	14.1		CX

Abbreviations:

Type: L = McKean Lanceolate ; S = Stemmed; N = Notched

Shape: CX = Convex; CV = Concave; ST = Straight; SR = Serrated

Material Type: Bas = Basalt; Ccs = Cryptocrystalline silicate; Ig = Ignimbrite; Obs = Obsidian; QTZTE = Quartzite; SW = Silicified wood; KRF = Knife River flint

\+ = Partial projectile point

Data obtained from Simpson (1984:25-27).

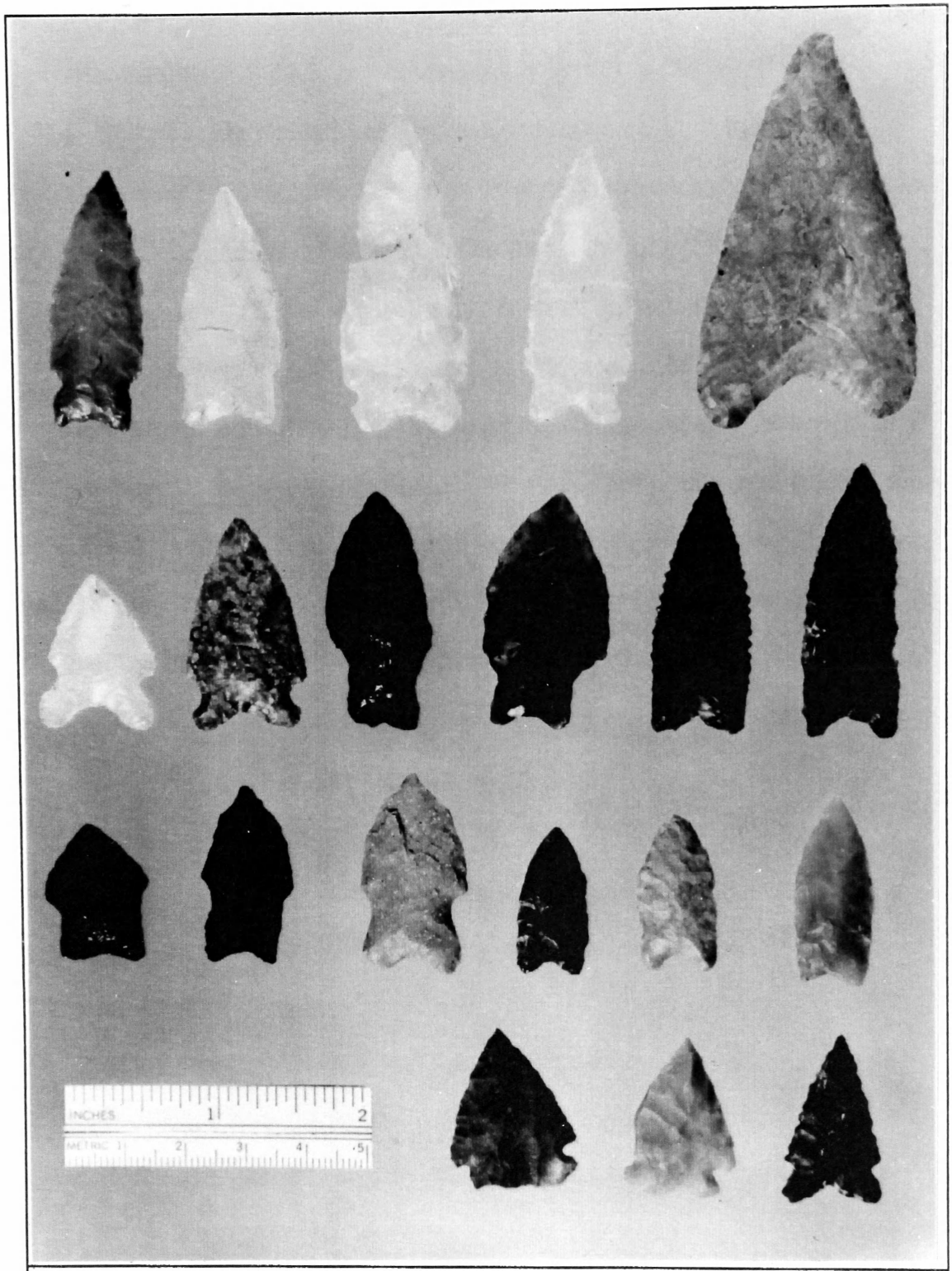


Figure 5: Representative sample of projectile points recovered from the Dead Indian Creek site (48PK551). Photo courtesy of Charles Swaim.

As illustrated in Figure 5, points stylistically similar to Oxbow, Powers-Yonkee and possibly Pelican Lake were also recovered from the Middle Prehistoric period component. These point styles were classified by the original recorder as "notched" and are listed in this thesis as such (Simpson 1984).

Despite the recovery of antler, bone, and shell artifacts (Frison and Walker 1984:40-41), an inventory of those items was not available. Information concerning the nonprojectile point stone artifacts was available, however, and is summarized in Table 8. Although quantities of each nonprojectile point stone artifact class were listed, material types were not always made available. The majority of the stone artifacts recovered from the Middle Prehistoric period component reflect general tool kit maintenance and food preparation activities among hunter/gatherer groups in the northwestern Plains. An exception to this trend among the artifacts is a fragment of a carved steatite pipe bowl. Possible source locations for the steatite used in the manufacture of the pipe bowl, however, were not given. Further, as the pipe fragment was found on the surface of the site its inclusion with the Middle Prehistoric period component of the site is questionable.

Table 9 summarizes metric and nonmetric observations taken on grinding stones recovered from the Middle Prehistoric period component at the Dead Indian Creek site. Sandstone was preferred for milling slabs. The average length of the 3 complete metates is 36.6 cm and their average thickness is 2.4 cm. Grinding stones tend to be of sandstone or other sedimentary materials; however, igneous materials were also selected. Of the 14 complete grinding

Table 8: Summary by number and material type of select stone artifacts recovered from the Middle Prehistoric period component at the Dead Indian Creek site.

Tool Category	Raw Material Categories																		
	Shale	KRF	Ccs	Sw	Mslstn	Porcelanite	Quartzite	Quartz	Argillite	Ignimbrite	Basalt	Obsidian	Green Steatite	Sandstone	Limestone	Sedimentary	Granite	Igneous	Indeterminate
Bifaces																			122
MRST																			89
Endscrapers																			7
Spokeshaves																			1
Gravers																			--
Cores																			6
Core tools																			2
Drills																			5
Hammerstones	1		1											1			1		
Incised disk																			
Grinding stones	1						2							21		11		8	
Shaft smoother														1			1		
Perforated disk							1												
Pipe fragment													1?						
McKean L.	4	1	66	4			10				1								
Notched points	1		17				1												
Stemmed p.p.	1		52				10			5	3	4							

Abbreviations:

Material Type: KRF = Knife River flint; Ccs = Cryptocrystalline silicate; Sw = Silicified wood; Mslstn = Metamorphosed siltstone

Tool Type: MRST = Marginally Retouched Stone Tool; McKean L. = McKean Lanceolate points; Stemmed p.p. = Duncan and Hanna points (undifferentiated)

? = Artifact was recovered out of context

Data obtained from Scott and Zeimens (1984:29-40)

Table 9: Metric and nonmetric observations on grinding stones recovered from the Middle Prehistoric period component at the Dead Indian Creek site.

Length (cm)	Thickness (cm)	Material	Type
--	4.1	Sedimentary	Grinding stone fragment
--	--	Sandstone	Grinding stone fragment
--	2.1	Sandstone	Metate fragment
--	1.3	Sedimentary	Metate fragment
--	1.4	Sandstone	Metate fragment
--	1.5	Sandstone	Metate fragment
10.9	7.1	Sedimentary	Grinding stone
--	4.4	Igneous	Grinding fragment
--	1.7	Sandstone	Metate fragment
--	1.9	Sandstone	Metate fragment
--	--	Igneous	Grinding stone fragment
11.9	5.8	Igneous	Grinding stone
12.9	5.2	Sandstone	Grinding stone
--	1.6	Sedimentary	Metate fragment
--	1.6	Sandstone	Metate fragment
--	3.4	Sandstone	Metate fragment
--	2.6	Sandstone	Metate fragment
--	1.1	Sandstone	Metate fragment
7.8	6.1	Igneous	Grinding stone fragment
15.5	5.4	Quartzite	Grinding stone
--	4.4	Sandstone	Metate fragment
9.9	4.0	Sandstone	Grinding stone fragment
--	1.4	Sandstone	Metate fragment
--	4.0	Sedimentary	Grinding stone fragment
13.5	5.0	Sandstone	Grinding stone
--	5.0	Sandstone	Grinding stone fragment
--	1.7	Sandstone	Metate fragment
9.7	4.9	Igneous	Grinding stone fragment
--	3.8	Sedimentary	Metate fragment
6.2	3.2	Igneous	Grinding stone fragment
--	6.3	Igneous	Grinding stone fragment
11.2	1.5	Shale	Metate fragment
--	2.0	Sedimentary	Metate fragment
7.1	2.7	Quartzite	Grinding stone fragment
--	--	Sedimentary	Grinding stone fragment
11.7	3.8	Igneous	Grinding stone fragment
--	3.2	Sedimentary	Grinding stone fragment
--	--	Sedimentary	Grinding stone fragment
48.5	2.2	Sandstone	Metate

Table 9: Continued

Length (cm)	Thickness (cm)	Material	Type
10.4	4.6	Sedimentary	Grinding stone
50.0	7.7	Sandstone	Metate
12.9	2.4	Sandstone	Grinding stone
14.8	3.2	Sandstone	Grinding stone

Data obtained from Miller and Bedord (1984:36-37)

stones analyzed, mean length is 11.1 cm and mean thickness is 4.5 cm.

4.3 *Discussion of Features*

Heating/cooking facilities recorded within the Middle Prehistoric period component are summarized in Table 10. The majority of the hearths exposed were prepared, rock filled features. Spatial patterning of the heating/cooking facilities was not discussed in the site report. Of note was the mention of cobble lined hearths and a photographic illustration of that feature type (Hillman 1984:45). The architecture of this feature type is similar to the slab lined hearths described at the McKean site. The difference is that the Dead Indian Creek site is located in an area where sandstone outcroppings are infrequent. The Middle Prehistoric period peoples who occupied the Dead Indian Creek site used water worn cobbles in place of sandstone slabs to line their hearths. As will be discussed in Chapter 10, the practice of lining hearth basins with stones appears to have a distinct geographic boundary.

Two unique features were exposed during excavations at the Dead Indian Creek site. The first was a pit house, which was initially misidentified as a portion of an old creek channel (Frison 1991:99). In cross section the pit house is quite symmetrical and concave in shape. Metric observations on the feature were apparently not taken. The second of the two unusual features was a collection of five sets of mule deer antlers still attached to the skull caps. One antler set was placed inside a basin shaped pit (80 cm in diameter x 40 cm deep) and covered with cobbles. The other four sets of antlers apparently were placed upon the original ground surface and covered by alluvial deposits within

Table 10: Heating/cooking facility and excavated pit data from the Middle Prehistoric period component at the Dead Indian Creek site.

Surface Shape	Profile Shape	Stone Filled/ Lined	Fracture Pattern of Stones	Surface Diameter (cm)	Pit Depth (cm)	FILL		
						Faunal Remains	Flakes or Artifacts	Charcoal or Ash
Circular	Basin	Lined	--	72.5	15.0	Bone frag	--	--
Circular	--	--	--	37.5	--	--	--	--
Circular	--	Filled	--	45	--	--	--	--
Circular	--	Filled	--	45	--	--	--	--
Circular	--	--	--	47.5	--	Bone frag	--	Ash
Circular	--	--	--	47.5	16.3	--	--	--
Circular	--	Filled	--	72.5	--	--	--	Charcoal
Elongated	Surface	Filled	--	--	--	--	--	--
Circular	--	--	--	60	--	--	--	--
--	--	Lined	--	52.5	10.0	--	--	--
--	Surface	Filled	--	--	--	--	--	--
Circular	Basin	--	--	70	22.5	--	--	--
--	Surface	--	--	--	--	Bone frag	--	--
Circular	--	Filled	--	67.5	--	--	--	--
Rectangular	--	--	--	105 x 150	17.5	Deer antler	--	--
Circular	--	--	--	--	17.5	--	--	--
Circular	--	Filled	--	52.5	Surface	--	--	--
Circular	--	Filled	--	60	30.0	--	--	--
Circular	--	Filled	--	75	40.0	--	--	--
Circular	--	Filled	--	45	--	--	--	--
Circular	--	--	--	--	--	--	--	--
Circular	--	--	--	37.5	22.5	--	--	--
Circular	--	Lined	--	80	20.0	--	--	--
Circular	--	Filled	--	60	60.0	--	--	--
Circular	--	Filled	--	45	--	--	--	--

Table 10: Continued

Surface Shape	Profile Shape	Stone Filled/ Lined	Fracture Pattern of Stones	Surface Diameter (cm)	Pit Depth (cm)	FILL		
						Faunal Remains	Flakes or Artifacts	Charcoal or Ash
Circular	--	Filled	--	50	--	--	--	--
Circular	--	--	--	60	--	--	--	--
Circular	--	--	--	60	15.0	--	--	--
Circular	--	--	--	52.5	15.0	--	--	--
Oval	--	--	--	45 x 60	--	--	--	--
Circular	--	Filled	--	45	--	--	--	--
Circular	--	Filled	--	30	23.8	--	--	--
Circular	Surface	Filled	--	22.5	--	--	--	--
Circular	--	Filled	--	52.5	15.0	--	--	--
Circular	--	Filled	--	50	--	--	--	--

Data obtained from Hillman (1984:43-44)

a short period of time. This assumption is based upon the generally sound condition of the antlers (Frison and Walker 1984:48-50). Ceremonialism and/or a cache situation have been proposed for this antler feature.

4.4 *Microfloral and Macrofloral Analysis*

No phytolith or flotation studies from the Dead Indian Creek site were mentioned in the available literature. However, if the interpretation that the Middle Prehistoric period component of this site was produced during the early to mid-winter months is correct (Frison and Walker 1984:112), the use of plant foods may have been minimal. The large number of complete and partial grinding stones recovered from the site implies at least three possibilities:

1) The Middle Prehistoric period occupants using the grinding stones occupied the site during late spring to mid-fall when plant resources were abundant.

2) The site was occupied largely or totally during winter months and seeds collected and stored during the summer and fall months were processed.

3) The Middle Prehistoric period occupants of the site used grinding stones for purposes other than milling plant materials.

In order to test these three hypotheses, the Dead Indian Creek site needs to be reinvestigated and hearth fill matrices need to be analyzed for macrofloral remains. In addition, blood residue analyses should be conducted on a sample of grinding stones recovered.

4.5 *Faunal Remains*

A variety of fauna are represented at the the Dead Indian Creek site, however, mule deer are the most abundant of the mammals. In fact, it appears

that at least one Middle Prehistoric period group chose the locale to exploit the mule deer that may have been wintering in the general area (Scott and Wilson 1984:51-62). A determination of winter use of the site was estimated on tooth eruption sequences from immature mule deer mandibles recovered from the site.

Various rodents and land snails are also listed as part of the faunal collection. Their presence at the site, however, does not necessarily imply their utilization by humans, because none of these faunal remains showed evidence of being exploited as food. Minimum number of species as represented by faunal elements recovered from the Middle Prehistoric period component is listed in Table 11.

4.6 *Chronometric Analysis*

Charcoal samples obtained from hearths associated with the Middle Prehistoric period complex component yielded three radiocarbon dates of 4430 ± 250 B.P., 4180 ± 250 B.P., and 3800 ± 110 B.P (Appendix: this volume). Obsidian hydration dates were also obtained from specimens collected from the Middle Prehistoric period component and, although not presented within the site report, the estimations were apparently in line with the previously listed C-14 dates (Frison and Walker 1984:13).

4.7 *Summary*

Although many artifacts were recovered during excavations at the Dead Indian Creek site, neither they nor associated soil formation processes provide good bases for determining whether McKean Lanceolate, Duncan, and Hanna

Table 11: Summary of faunal remains recovered from the Middle Prehistoric period component at the Dead Indian Creek site.

Scientific Name	Common Name	MNI
Ovis canadensis	bighorn sheep	16
Cervus elaphus	wapiti	2
Odocoileus hemionus	mule deer	50
Bison bison	modern bison	4
Canis sp.	--	2
Lepus sp.	rabbit	1
Sylvilagus sp.	rabbit	3
Pica pica	black billed magpie	1
Antilocapra americana	pronghorn	3
Ursus americanus	black bear	1
Unios sp.	fresh water clams	1
Oreohelix strigosa	land snail	82
Oreohelix sp.	snail species	2
Dendragapus obscurus	blue grouse	1
Marmota flaviventris	yellow bellied marmot	2
Spermophilus armatus	Uinta ground squirrel	10
Tamiasciurus hudsonicus	red squirrel	2
Tomomys talpoides	northern pocket gopher	9
Neotoma cinera	bushy-tailed woodrat	1
Microtus longicaudus	longtailed vole	2
Ondatra zibethicus	muskrat	1
Erithizon dorsatum	porcupine	4

Data obtained from Scott and Wilson (1984:51-62)

points co-occur or have distinct temporal boundaries. Based on the general description of the site's stratigraphy, processes that have operated to form the site can be characterized as several hundred years of periodic human occupation and deposition accompanied by slow soil development and continuous mixing of the cultural deposits by hearth and pit excavation and, possibly, rodent burrowing. If isolated cultural strata exist at the site, they apparently cannot be separated visually. Frison and Walker (1984:12) characterized cultural materials representing Middle Prehistoric period groups at the site as, " ...distributed through a level that varied as much as 90 cm thick in places to as little as 31 cm thick in others".

In addition, the great range in projectile point variability suggests to this writer that non-McKean complex peoples using Oxbow and possibly Yonkee and Pelican Lake technologies also occupied the site on occasion. Care should thus be taken if associating data presented here entirely with the McKean complex.

5.0 24RB1164

5.1 *General Site Setting*

Located in the Pine Parklands of southeastern Montana at the confluence of two seasonal drainage channels (Figure 6), 24RB1164 represents several episodes of cultural settlement from McKean complex times through the Late Prehistoric period. Although four distinct settlement areas were identified at the site, the McKean complex component is best represented by an isolated cultural stratum within what Munson defined as the Task 4 Area. This Task 4 Area stratum is located from approximately 50 to 60 cm below the present ground surface (BS), and may or may not represent a single episode of cultural occupation (Munson 1990a:2-3, 9-35).

Figure 6: General site setting of 24RB1164. Photo courtesy of Gene Munson.

In total, an area of 160.5 square meters was excavated within the Task 4 Area of the site (Munson 1990a:7-3). The recovered artifact, feature, and faunal assemblages suggest that the site was used during McKean complex times for general equipment maintenance and tool production. The large quantity of bone fragments recovered from the McKean complex stratum provides evidence of low to moderate numbers of large and medium size ungulates being processed at the site -- although no associated kill site could be identified.

Soils at 24RB1164 largely result from colluvial deposition. As the site lays between two ephemeral tributary systems, which converge at its southeastern margin, some alluvial deposition may have accompanied seasonal runoff. It was also proposed that runoff events succeeding the presence of McKean complex peoples at the site may have removed much of the McKean component (Wendt 1990).

5.2 *Artifact Assemblage*

Table 12 summarizes the metric data and nonmetric observations on projectile points recovered from the McKean complex component. A single Mallory point, one Hanna point, 16 Duncan points, and four fragments believed to be from Duncan points were identified by Munson (Figure 7). Using Wheeler's (1954) definitions for what constitutes Duncan and Hanna point types, however, specimens b, d, f, g, h, i, n, o, p, q, and r (Figure 7) might best be classified as Hanna points. As this writer was unable to relate most of the metric and nonmetric data presented in the site report to the individual points

Table 12: Metric and nonmetric observations on projectile points recovered from the McKean complex component at 24RB1164.

						Stem		Basal	Height of	
Type	Basal Shape	Raw Material	Length (mm)	Width (mm)	Thickness (mm)	Length (mm)	Width (mm)	Width (mm)	Notch (mm)	Blade Outline
S	--	Por	47	17	6	--	--	--		--
*S	--	Por	33	21	7	--	--	--		--
S	--	TRSS	42	19	8	--	--	--		--
S	--	Nvng	43	17	8	--	--	--		--
S	--	Ccs	34	18	5	--	--	--		--
*S	--	Por	41	22	7	--	--	--		--
*S	--	Por	21	17	6	--	--	--		--
*S	--	Por	9	15	6	--	--	--		--
S	--	Qtz	54	21	6	--	--	--		--
S	--	Por	44	19	7	--	--	--		--
S	--	Por	38	19	6	--	--	--		--
*S	--	Por	21	21	6	--	--	--		--
*S	--	Nvng	34	17	7	--	--	--		--
*S	--	Por	28	21	7	--	--	--		--
*S	--	Por	13	16	5	--	--	--		--
*H	--	Por	38	22	5	--	--	--		--
*M	--	Por	17	18	4	--	--	--	--	--
*Ind.	--	Ccs	24	20	4	--	--	--		--
*Ind.	--	Por	21	19	5	--	--	--		--
*Ind.	--	Por	11	15	4	--	--	--		--
*Ind.	--	Por	25	21	3	--	--	--		--

Abbreviations:

Type: S = Stemmed point; H = Hanna; M = Mallory; Ind. =Indeterminate point type

Material Type: Cryptocrystalline silicate = Ccs; Nonvolcanic natural glass = Nvng; Porcelanite = Por; Quartz = Qtz; Tongue River silicified sediment = TRSS

* = Incomplete projectile point

Data obtained from Munson (1990a:9-44, 9-45)

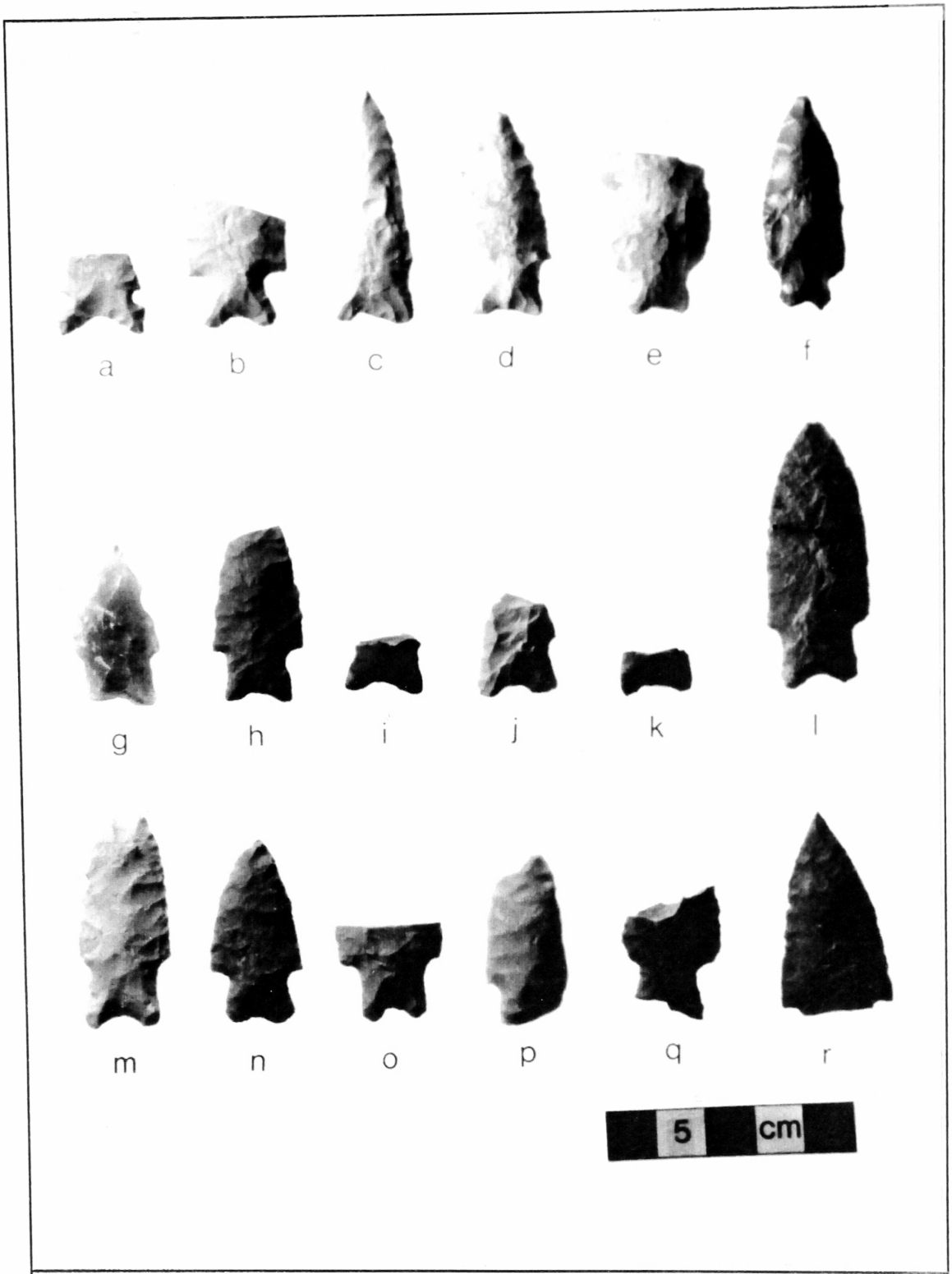


Figure 7: Projectile points recovered from the McKean complex component at 24RB1164. Photo courtesy of Gene Munson.

illustrated in Figure 7, the majority of those points are classed as "stemmed" in Table 12. Of these 21 projectile points and point fragments, 16 are of porcelanite; two are of cryptocrystalline silicates (CCS); one is of Tongue River silicified sediment; one is of quartzite; and one is of nonvolcanic natural glass. Mean length of the seven complete projectile points is 43 mm, with the longest specimen 54 mm and the shortest specimen 34 mm. Mean width of the 16 complete and fragmentary stemmed projectile points is 19 mm, and mean thickness is 6.4 mm (Munson 1990a:9-44, 9-45).

Although bone, antler, and shell artifacts were lacking, numerous lithic artifacts were recovered from the McKean complex component (Table 13). In total, 46 bifaces were recovered during excavations of the McKean complex component at 24RB1164. Six are classed as being primary reduction stage; 13 are listed as secondary reduction stage; 24 are grouped as tertiary reduction stage; and 3 are identified as finished bifaces. Of those, 42 are of porcelanite; 3 are of nonvolcanic natural glass; and one is of basalt (Munson 1990a:9-44, 9-46).

Four "flake" endscrapers, all of which are of cryptocrystalline silicates, were also identified (Munson 1990a:9-44, 9-47). Similar informal endscrapers were recovered at the Lightning Spring site in northwestern South Dakota. Keyser and Davis (1984:22) suggested that style of endscraper to be potentially diagnostic of the McKean complex -- at least for the general area. In addition to the stone artifacts previously mentioned are 5 marginally retouched porcelanite flakes, and 1 porcelanite drill. Recovered lithic debitage consists of 2 obsidian

Table 13: Summary by number and material type of select stone artifacts recovered from the McKean complex component at 24RB1164.

Tool Category	Raw Material Categories																	
	Nvng	KRF	Sw	Shale	Porcelanite	Quartzite	Quartz	Argillite	Ignimbrite	Basalt	Obsidian	TRSS	Felsic lava	Limestone	Diatomite	Granite	Mica schist	Indeterminate
Bifaces	3				42					1								
MRST																		
Endscrapers																		
Spokeshaves																		
Gravers																		
Cores																		
Core tools																		
Drills					1													
Hammerstones																		
Unifaces					5													
Mallory point					1													
Hanna point					1													
Stemmed point	2				10		1					1						
Ind. point					3													

Abbreviations:

Material Type: Nvng = Nonvolcanic natural glass; KRF = Knife River flint; Ccs = Cryptocrystalline silicate; Sw = Silicified wood; TRSS = Tongue River silicified sediment

Tool Type: MRST = Marginally Retouched Stone Tool; Ind. point= Indeterminate point type fragment

Data obtained from Munson (1990a:9-35, 9-44)

flakes, 10,014 porcelanite flakes, 116 CCS flakes, and 134 quartzite flakes. With the exception of obsidian, all of these materials are obtainable locally, either from porcelanite outcroppings or gravel beds. In terms of lithic reduction technology for the local McKean complex, Munson (1990a:9-44,9-48) notes an emphasis on bifacial core reduction for porcelanite and a flake core reduction strategy for nonporcelanites .

5.3 *Activity Floor Analysis*

Heating/cooking facilities exposed at 24RB1164 consisted of surface hearths exclusively (Table 14). Surrounding each surface hearth was "a large and dense concentration of tools, lithics, bone, and FCR (Munson 1990a:12-8)". Another feature type of the McKean complex component exposed with excavations at 24RB1164 are two east/west linear arrangements of stone. One of the stone alignments measured 34 cm N/S x 100 cm E/W and the other alignment measured 200 cm N/S x 110 cm E/W. Associated with the second alignment were several pieces of lithic debitage, firecracked rock (FCR) and fragmentary bone. These linear stone arrangements have been interpreted as possibly having an astronomical function (Munson 1990a:13-1), but may have been a product of food preparation or other domestic activities.

5.4 *Microfloral and Macrofloral Analysis*

Although soil samples were submitted for flotation analysis, no macrofloral evidence was recovered from the McKean stratum. Microfloral analysis was conducted on samples taken from a soil column within the site. Identified

Table 14: Heating/cooking facility and feature data from the McKean complex component at 24RB1164.

Surface Shape	Profile Shape	Stone Filled Lined	Fracture Pattern of Stones	Surface Diameter (cm)	Pit Depth (cm)	Fill		
						Faunal Remains	Flakes or Artifacts	Ash or Charcoal
Irregular	Surface			110-40		--	Flakes	--
Irregular	Surface			63x45		--	Flakes	--
Irregular	Surface			40x50		--	--	--
Irregular	Surface			90x84		--	--	--
Irregular	Surface			42x20		--	--	--
Circular	Surface			50x50		--	--	--
Irregular	Surface			35x50		--	Flakes	--
Rock Cluster	Irregular		--	17x20		--	--	--
FCR Cluster	Irregular		--	50x20		--	--	--
Irregular	Surface			43x63		--	--	--
Irregular	Surface			90x70		--	Flakes	--

Data obtained from Munson (1990a:12-8)

phytoliths and pollens suggest that the local climate during McKean complex times resembled the semi-arid climate of today (Munson 1990a:B-6-B-7).

5.5 *Faunal Remains*

Bones and bone fragments from at least two *Bison bison* (modern bison), and at least one whitetailed deer (*Odocoileus virginianus*) dominate the faunal assemblage (Table 15) of the McKean complex component. Due to a paucity of identifiable skeletal elements, minimum number of individuals was calculated based on two left bison astragali and a single right astragalus from a Whitetailed deer (Rittel 1990:10-18 -10-24).

5.6 *Chronometric Analysis*

Three radiocarbon dates relate to the McKean complex component of Task 4 Area at 24RB1164. Two separate charcoal samples produced dates of 2200 ± 160 B.P. and 2570 ± 60 B.P., and a bone sample produced a date of 3310 ± 90 B.P. Both charcoal samples, identified as charred Ponderosa pine *(Pinus ponderosa*), were recovered in context from heating/cooking features (Munson 1990a: 11-2; Appendix: this volume).

5.7 *Summary*

The McKean complex component at site 24RB1164 represents at least one, but possibly a limited number of occupation sequences in the Pine parklands of southeastern Montana. Activities of McKean complex people at 24RB1164 appear to be consistent with tool maintenance and production and small scale processing of medium and large artiodactyla. Of interest within the artifact assemblage is the similarities with the artifact assemblage recovered from the

Table 15: Summary of faunal remains recovered from the McKean complex component at 24RB1164.

Scientific Name	Common Name	MNI
Bison bison	modern bison	2
Odocoileus viginianus	whitetailed deer	1

Data obtained from Rittel (1990:10-18-10-24)

McKean component at Lightning Spring (32HN204) in southwestern South Dakota. Further, and as will be discussed in the following chapter, the overlap of the earliest date obtained at 24RB1164 and the latest date for the McKean complex component at the Lightning Spring site would appear to indicate that the same, or closely related, group(s) produced the McKean components at these two sites.

6.0 THE LIGHTNING SPRING SITE

6.1 *General Site Setting*

Lightning Spring is a perennial, natural spring located at the eastern margin of the North Cave Hills of northwestern South Dakota. The spring's source is in a small, roughly circular basin covering an area of approximately 5 acres. A substantial amount of sediment veneers the basin bottom because of colluvial and alluvial processes. Those geomorphological processes have provided an ideal environment for the development of a well preserved, well stratified, archaeological site. The site (32HN204) was initially test excavated in 1980 and a continuation of the initial excavations was carried out in 1991. A combined total of 4, one meter square units were layed out and excavated during the 1980 and 1991 investigations at the site. Total area excavated, however, was not available, but an estimate of 154 square meters can be made based on excavated depths which began at the ground surface and extended to 330 cm and 440 cm BS (Keyser and Davis 1984:1; Keyser and Wettstaed 1991:3).

Cultural materials recovered during excavations suggests that prehistoric people(s) intermittently inhabited the basin bottom from McKean complex times through the Late Prehistoric period (Keyser and Davis 1984; Keyser and Wettstaed 1991:1-2). Of the fifteen recognized cultural strata at the site, strata 8 through 15 are associated with the McKean complex. No photo of the Lightning Spring site was available for this thesis.

6.2 *Artifact Assemblage*

Although too few data were presented in the excavation reports to perform a metric analysis of the McKean complex points, the available metric and nonmetric data were placed in a table for reference (Table 16). Fourteen projectile points and point fragments were recovered from cultural strata 8 through 14 at Lightning Spring. Two of the points are complete; four have slight damage to either the base or tip; six are represented by basal fragments broken at the stem/blade juncture; one of the point fragments is a midsection, and one is an "ear" of a projectile point base (Figure 8). Three of the projectile points are made of Knife River flint; two are of porcelanite, two are of Tongue River silicified sediment; four are of unidentified CCS; and three of the point fragments were unidentified as to material type (Keyser and Davis 1984:17-18; Keyser and Wettstaed 1991:9-11). All projectile points and point fragments were identified as definitely or probably belonging to the Duncan type (Keyser and Davis 1984:17; Keyser and Wettstaed 1991:9). The near 90° shoulder angle of specimens 1-4 in Figure 8, however, suggest that these points are best classified as Hanna type. As I was unable to associate the available metric and nonmetric attributes with the points illustrated in Figure 8, the McKean complex points are generically categorized as "stemmed" within Table 16.

Nonstone artifacts (Table 17) recovered from the McKean complex component are limited to an unidentifiable bone tool, a fragment of a deer antler tine pressure flaking tool, and a basal fragment of a deer antler (Keyser and Davis 1984:30; Keyser and Wettstaed 1991:18-19). Nonprojectile point stone

Table 16: Metric and nonmetric observations on projectile points recovered from the McKean complex component at the Lightning Spring site.

						Stem			Height of	
Type	Basal Shape	Raw Material	Length (mm)	Width (mm)	Thickness (mm)	Length (mm)	Width (mm)	Basal Width (mm)	Notch (mm)	Blade Outline
S	--	KRF	--	--	--	--	--	10.5		--
S	--	KRF	--	--	--	--	--	15.5		--
S	--	KRF	--	--	--	--	--	--		--
S	--	Por	--	--	--	--	--	--		--
S	--	Por	--	--	--	--	--	--		--
S	--	TRSS	--	--	--	--	--	--		--
S	--	TRSS	--	--	--	--	--	--		--
S	--	Ccs	--	--	--	--	--	--		--
S	--	Ccs	--	--	--	--	--	--		--
S	--	Ccs	--	--	--	--	--	--		--
S	--	Ccs	--	--	--	--	--	--		--

Abbreviations:

Type: Stemmed = S

Material Type: Cryptocrystalline silicate = Ccs; Knife River flint = KRF; Porcelanite = Por; Tongue River silicified sediment = TRSS

Data obtained from Keyser and Davis (1984:17-18) and Keyser and Wettstaed (1991:9-11)

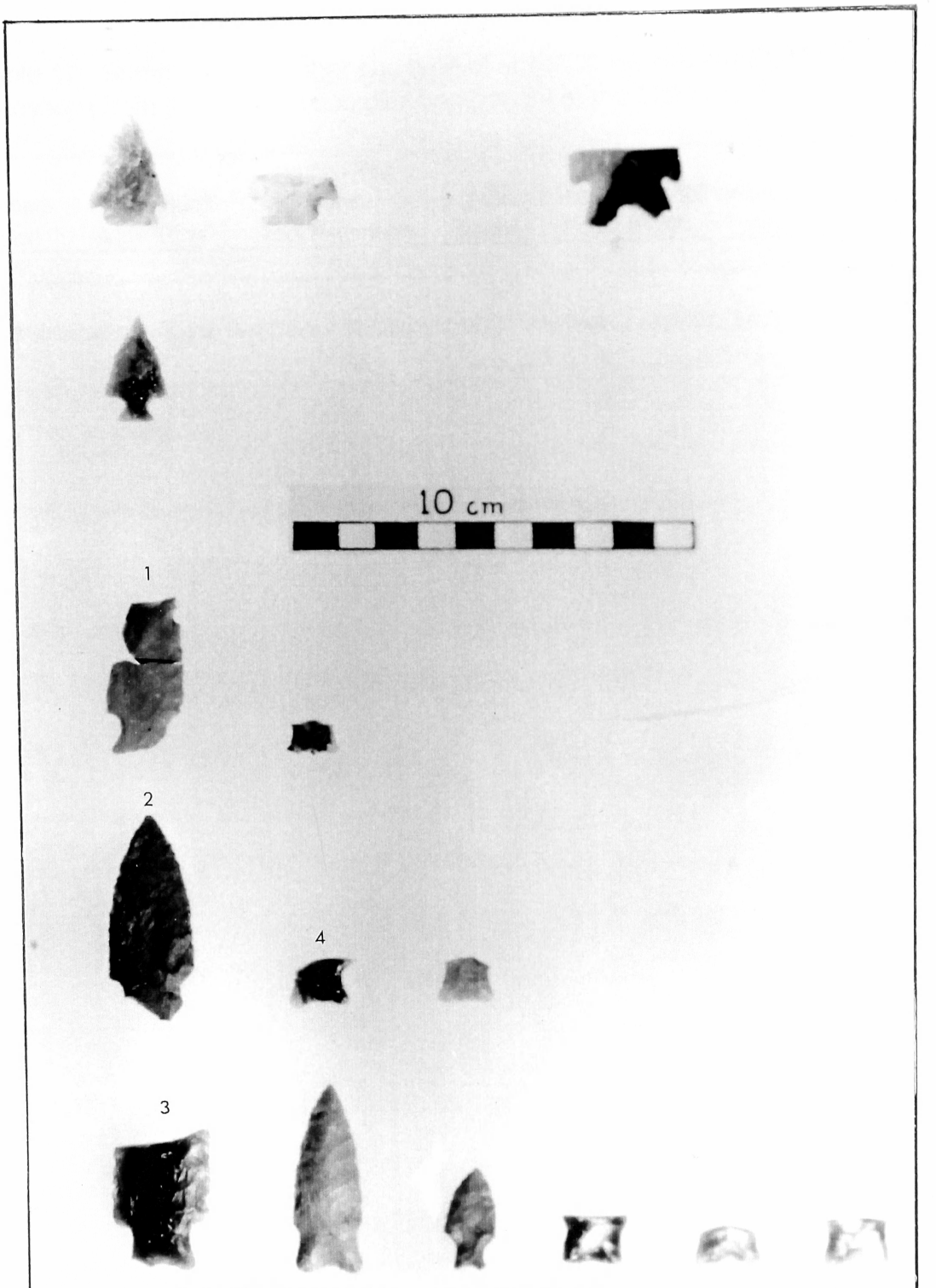


Figure 8: Projectile points recovered from the Lightning Spring site (32HN204). Lower three rows represent points from the McKean complex component. Photo courtesy of Jim Keyser.

Table 17: Summary by number and type of antler, bone and shell artifacts recovered from the McKean complex component at the Lightning Spring site.

Bone Awl	Blunt Ended Bone Tools	Unidentified Bone Tool Fragments	Bone Beads	Antler Tools	Shell Artifacts (#)	(Type)
0	1	0	0	2	0	

Data obtained from Keyser and Davis (1984:30) and Keyser and Wettstaed (1991:18-19)

artifacts (Table 18) are more numerous than nonstone artifacts. Of particular interest are the eight endscrapers that are manufactured from a thin, flat flake. Keyser and Davis (1984:22) comment that, "The occurrence of flake endscrapers... at the exclusion of plano-convex endscrapers suggests that flake scrapers may be diagnostic of the McKean complex in this area. " Also associated with the recovered artifacts were a single spokeshave, three gravers, three cores, five unifaces, two denticulates, 26 bifaces, and a piece of sandstone which was interpreted as being a whetstone or similar abrading device (Keyser and Davis 1984:17-26; Keyser and Wettstaed 1991:11-17). Five grinding stones (Table 19) were also recovered during excavations of the McKean complex component at Lightning Spring (Keyser and Davis 1984:30-31; Keyser and Wettstaed 1991:17-18). After analyzing the lithic debitage and stone artifacts of the McKean complex component, Keyser and Davis reconstructed what they interpreted as a seven-stage lithic reduction process beginning at the raw material procurement stage and terminating with the finished projectile point.

6.3 *Activity Floor Analysis*

Seven basin hearths and three surface hearths were exposed within the McKean complex component at Lightning Spring (Table 20). The general pattern of the heating/cooking facilities was described by Keyser and Davis (1984:11-15) as an irregularly lined pit hearth with an adjacent surface hearth. Ash and charcoal was present in all but one of the prepared basin hearths, and two of the three surface hearths. Bone fragments and lithic debitage were also

Table 18: Summary by number and material type of select stone artifacts recovered from the McKean complex component at the Lightning Spring site.

Tool Category	Raw Material Categories																		
	Nvng	KRF	Ccs	Sw	TRSS	Porcelanite	Quartzite	Quartz	Argillite	Ignimbrite	Basalt	Obsidian	Ironstone	Felsic lava	Limestone	Sandstone	Granite	Mica schist	Indeterminate
Bifaces																			26
MRST																			19
Endscrapers		4		1															2
Spokeshaves																			
Gravers		1				1													
Cores																			
Grinding stones																6			
Drills						1													
Hammerstones																			
Unifaces						5													
Denticulates		1			1														
Stemmed points		3	4		2	2													

Abbreviations:

Material Type: Nvng = Nonvolcanic natural glass; KRF = Knife River flint; Ccs = Cryptocrystalline silicate; Sw = Silicified wood; TRSS = Tongue River silicified sediment

Tool Type: MRST = Marginally Retouched Stone Tool

Data obtained from Keyser and Davis (1984:17-26) and Keyser and Wettstaed (1991:11-17)

Table 19: Metric and nonmetric observations on grinding stones recovered from the McKean complex component at the Lightning Spring site.

Length (cm)	Thickness (cm)	Material	Type
8.6	3.3	Sandstone	Grinding stone
10.2	3.5	Sandstone	Grinding stone
19.2	4.0	Sandstone	Grinding stone
30	14	Sandstone	Grinding stone
14	2.5	Sandstone	Grinding stone

Data obtained from Keyser and Davis (1984:30-31) and Keyser and Wettstaed (1991:17-18)

Table 20: Heating/cooking facility and excavated pit data from the McKean complex component at the Lightning Spring Site.

Surface Shape	Profile Shape	Stone Filled/ Lined	Fracture Pattern of Stones	Surface Diameter (cm)	Pit Depth (cm)	FILL		
						Faunal Remains	Flakes or Artifacts	Charcoal or Ash
Ovoid	Surface	--	--	50		Bone frag	Flakes	Ash & charcoal
Circular	Basin	FIlled	--	55	13	Bone frag	Flakes	Ash & charcoal
Circular	Basin	--	--	55	11	Bone frag	Flakes	Ash & charcoal
Ovoid	Surface	--	--	50		--	--	Ash & charcoal
Oval	Surface	--	--	50		--	--	--
--	Basin	--	--	55	7	--	--	--
Oval	Basin	Filled	--	63	23	Bone frag	Flakes	Ash & charcoal
Ovoid	Basin	--	--	50	8	Bone frag	Flakes	Ash & charcoal
Ovoid	Basin	--	--	20	2	Bone frag	Flakes	Ash & charcoal
Ovoid	Basin	--	--	20	2	Bone frag	Flakes	Ash & charcoal

Data obtained from Keyser and Davis (1984:11-14) and Keyser and Wettstaed (1991:8)

common within hearth fill. The differences in feature patterning between 24RB1164 and Lightning Spring may reflect the time of year the sites were inhabited, the duration of the occupations, or the types of food being prepared within the sites.

6.4 *Microfloral and Macrofloral Analysis*

By means of flotation techniques, charred seeds and other plant remains were separated from collected hearth fill matrices. Table 21 summarizes the macrofloral remains recovered. Although charred seeds from plants commonly exploited by native Plains cultures were recovered, the evidence does not suggest even a moderate reliance on plant resources. No microfloral analysis of sediments from the site was available for review.

6.5 *Faunal Remains*

Faunal elements recovered from the McKean complex component at the Lightning Spring site are summarized in Table 22. A minimum of nine bison, seven pronghorn, three bighorn sheep, and the remains of a single canid are represented. Whether the canid represents a domesticated or wild species was undetermined (Keyser and Davis 1984:39-40). Apparently, no seasonally sensitive data were recovered during excavations.

6.6 *Chronometric Analysis*

Charcoal samples taken from hearths in strata 8-10 during the 1980 excavations yielded four radiocarbon dates. Stratum 8 produced a date of 3430 ± 270 B.P.; stratum 9 produced a date of 4190 ± 110 B.P.; and stratum 10 produced two dates of 3870 ± 210 B.P., and 3850 ± 150 B.P. During

Table 21: Summary of macrofloral remains recovered from the McKean complex component at the Lightning Spring site.

Scientific Name	Common Name	Number of Elements
Rosa sp.	--	1
Chenopodium sp.	--	4
Gramineae	--	2
Rumex sp.	--	11
Polygonum sp.	--	2
Fabaceae	--	3
Compositae	--	36
--	--	

Data obtained from Keyser and Davis (1984:32-33)

Table 22: Summary of faunal remains recovered from the McKean complex component at the Lightning Spring site.

Scientific Name	Common Name	MNI
Bison bison	modern bison	9
Antilocapra americana	pronghorn	7
Ovis canadensis	bighorn sheep	3
Canis sp.	--	1

Data obtained from Keyser and Davis (1984:39-40)

excavations at Lightning Spring in 1991, a charcoal sample recovered from stratum 12 produced a date of 4040 ± 90 B.P. During that same series of excavations a charcoal sample from a hearth within stratum 14 produced a radiocarbon date of 4200 ± 170 B.P (Keyser and Davis 1984:12, 14; Keyser and Wettstaed 1991.7-8; Appendix: this volume).

6.7 *Summary*

The Lightning Spring site reflects occasional and stratigraphically discrete occupation surfaces from Middle Prehistoric period to Late Prehistoric period times. The recovered artifacts, debitage, and features reflect general tool maintenance and production as well as domestic activities. Based on the results of radiocarbon dating, the Lightning spring site (32HN204) appears to have been intermittently occupied by McKean complex peoples for a time span of approximately 800 years. Because the site locale was frequented by McKean complex peoples for such a long time span, the site may have been a preferred campsite within a patterned seasonal round.

7.0 THE CACTUS FLOWER SITE

7.1 *General Site Setting*

The Cactus Flower site (EbOp 16) is located along a portion of the west bank of the south Saskatchewan River in southeastern Alberta (Figure 9). Cactus Flower is a multicomponent, multiple occupation site reflecting Middle and Late Prehistoric period usage. Brumley (1975) characterized the prehistoric inhabitants of the site as adapted to a short grass prairie environment and subsisting chiefly on bison (Brumley 1975). The stratified nature of cultural deposits within the site is a result of periodic episodes of rapidly deposited alluvium.

Figure 9: Work in progress at the Cactus Flower site (EbOp 16) during the 1974 field season. Photo courtesy of John Brumley.

Of ten identified cultural strata, all but the lowest occupation level yielded organic material for radiocarbon analysis and temporally diagnostic projectile points. Occupations III through IX produced projectile points characteristic of the McKean complex. In total area, 1840 square meters were excavated within the Cactus Flower site. Of that total, approximately 180.5 square meters were excavated within Occupation III; 219 square meters were excavated within occupation IV; 229 square meters were excavated within occupation V; 230 square meters were excavated within occupation VI; 234 square meters were excavated within occupation VII; 130 square meters were excavated within occupation VIII; and 130 square meters were excavated within occupation IX.

7.2 *Artifact Assemblage*

Table 23 summarizes metric and nonmetric observations on the McKean complex projectile points recovered during excavations at the Cactus Flower site. Although metric data for each projectile point were not available, Brumley (1975:117) summarized the statistical analysis of the projectile points within the site report. A distribution chart (Brumley 1975:123) of the projectile points from the McKean complex levels indicates the McKean Lanceolate form occurs throughout all but the most recent McKean occupation level, whereas the stemmed forms (Duncan and Hanna) occur throughout all but the earliest McKean level. This apparent distribution, however, may be more a matter of sampling than reality as only a single point was recovered from occupation IX, and one Duncan and two Hanna points were recovered from occupation III. Although Brumley recognized that the three point styles co-occur, he also

Table 23: Metric and nonmetric observations on projectile points recovered from the McKean complex component at the Cactus Flower site.

Type	Basal Shape	Raw Material	Length (mm)	Width (mm)	Thickness (mm)	Stem Length (mm)	Stem Width (mm)	Basal Width (mm)	Height of Notch (mm)	Blade Outline
L	--	Ccs	27	14	4.9	--	--	--		--
L	--	Ccs	37.9	21.6	6.6	--	--	--		--
L	--	Ccs	--	--	--	--	--	--		--
L	--	Ccs	--	--	--	--	--	--		--
D	--	Ccs	17	15	5.1	9.2	11.7	--		--
D	--	Ccs	48.1	22.3	8.4	15.6	17.6	--		--
D	--	Ccs	--	--	--	--	--	--		--
D	--	Ccs	--	--	--	--	--	--		--
D	--	Ccs	--	--	--	--	--	--		--
D	--	Ccs	--	--	--	--	--	--		--
D	--	Ccs	--	--	--	--	--	--		--
D	--	Ccs	--	--	--	--	--	--		--
D	--	Sw	--	--	--	--	--	--		--
D	--	Slstn	--	--	--	--	--	--		--
D	--	Obs	--	--	--	--	--	--		--
H	--	Ccs	34.2	17.5	5.2	9.8	13.9	--		--
H	--	Ccs	58.6	24.9	--	12.9	18.5	--		--
H	--	Ccs	--	--	--	--	--	--		--
H	--	Ccs	--	--	--	--	--	--		--
H	--	Ccs	--	--	--	--	--	--		--
H	--	Ccs	--	--	--	--	--	--		--
H	--	Sw	--	--	--	--	--	--		--
H	--	--	--	--	--	--	--	--		--
H	--	--	--	--	--	--	--	--		--

Abbreviations:

Type: L = McKean Lanceolate ; D = Duncan; H = Hanna

Material Type: Ccs = Cryptocrystalline silicate; Obs = Obsidian; Slstn = Silicified siltstone; Sw = Silicified wood

Data obtained from Brumley (1975:38-40)

suggested that McKean Lanceolate points may dominate in frequency in the earlier McKean complex occupations and the stemmed (Duncan and Hanna) forms may dominate in the later McKean complex occupations (Brumley 1975: 100-101). That concept will be further considered in Chapter 11 of this thesis.

Four of the projectile points recovered during excavation of the McKean complex component are classified as McKean Lanceolate, 11 as Duncan, and 10 as Hanna. Figure 10 illustrates the range in morphological variability among the McKean complex projectile points recovered from the Cactus Flower site.

Cryptocrystalline silicates were the material of preference for projectile point manufacture among the McKean complex occupants at Cactus Flower. They constitute 90% of the recovered projectile points. With the exception of obsidian (n=1), all lithic materials used in projectile point production are available locally in the glacial tills.

Antler, bone, and shell artifacts (Table 24) and the nonprojectile point stone artifacts (Table 25) recovered during excavations of the McKean complex component suggest a great deal of animal processing, tool maintenance and production and other domestic activities. Although limited, evidence of long distance trade or contact with peoples to the west of the northern Plains is reflected in some of the shell items from the McKean component. Specifically, those materials consist of a fragmentary *Olivella biplicata* shell bead and a complete shell bead of *Natica clausa* which likely have origins at the west coast (Brumley 1975:69).

One incomplete bone artifact, lacking an identified function, resembles a

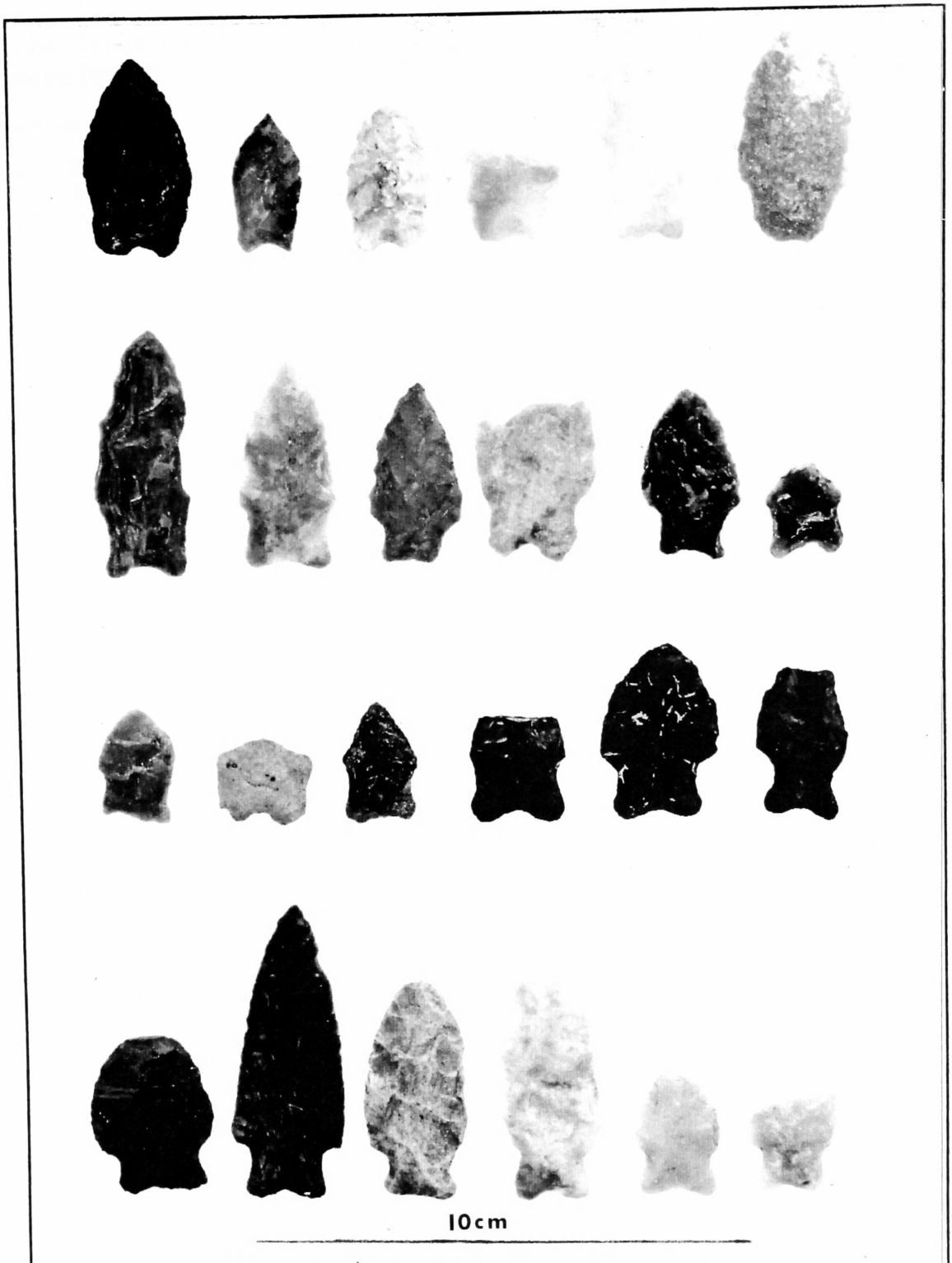


Figure 10: Projectile points recovered from the McKean complex component at the Cactus Flower site (EbOp-16). Photo courtesy of John Brumley.

Table 24: Summary by number and type of antler, bone and shell artifacts recovered from the McKean complex component at the Cactus Flower site.

Bone Awl	Blunt Ended Bone Tools	Unidentified Bone Tool Fragments	Bone Beads	Antler Tools	Shell Artifacts (#)	(Type)
12	3	19	3	3	2	beads
					1	disk

Data obtained from Brumley (1975:62-69)

Table 25: Summary by number and material type of select stone artifacts recovered from the McKean complex component at the Cactus Flower site.

	Raw Material Categories																		
Tool Category	Slstn	KRF	Ccs	Sw	TRSS	Porcelanite	Quartzite	Quartz	Argillite	Slate	Basalt	Obsidian	Ironstone	Sandstone	Limestone	Diatomite	Granite	Mica schist	Indeterminate
Bifaces	1		68	4			2												
Hafted bifaces			4				1												
MRST	2		148	3			45												
Endscrapers			39	1															2
Spokeshaves	1		4				2												
Gravers			3																
Cores			66				1												
*Core tools			3	1			64		9										
Drills																			
Hammerstones							3		7					1					
Unifaces						5													
Stone disks									1	1									
Stone pipe																			1
McKean L.			4																
Duncan points	1		8	1								1							
Hanna points			6	1															2

Abbreviations:

Material Type: Slstn = Silicified siltstone; KRF = Knife River flint; Ccs = Cryptocrystalline silicate; Sw = Silicified wood; TRSS = Tongue River silicified sediment

Tool Type: MRST = Marginally Retouched Stone Tool; McKean L. = McKean Lanceolate points

* = Heavy chipped stone tools,as defined by Brumley (1975), are subsumed under this category

Data obtained from Brumley (1975:40-69)

harpoon point, but could as well be a weaving or netting implement. This artifact is described as:

> ...made from a thick piece of long bone shaft. One edge is straight, while the other edge first flares sharply away from one end, crests and then converges slowly towards the other end. A deep, broad, well shaped notch has been cut obliquely into the gentle converging portion of the edge adjacent to where it crests. The end adjoining the steeply flaring portion of edge shows clear indications of having been cut part way through on both surfaces and then broken. The opposite end is flat with steeply rounded edges. With the exception of the broken end, the entire surface of the specimen has been completely smoothed and has a light sheen. In transverse and longitudinal cross section, the specimen is flat with thick, sharply rounded edges. The broken-through end is jagged (Brumley 1975:66).

Nonprojectile point stone artifacts recovered during excavation of the McKean complex component reflect domestic activities, intensive animal processing activities, and activities associated with personal adornment, recreation, and/or socio-religious aspects. Materials representing the latter three categories were a circular, polished argillite pebble, a ground slate disk fragment, a tubular stone pipe of unidentified lithic material, and an ammonite septum. Although the ammonite septum did not exhibit any evidence of cultural modification, these items have been documented as fetishes among many native, historic northern Plains groups (Kehoe 1965).

Of note among the nonprojectile point stone artifacts recovered during excavation of the McKean complex component were hafted spokeshaves. Hafted spokeshaves are uncommon in the archaeological record of the northern Plains, and Brumley (1975) suggested that they may be diagnostic of the McKean complex in the area. Hafted spokeshaves were also recovered

from the lowest excavated level (Pictograph Cave I) within Pictograph Cave (24YL1) in south central Montana (Mulloy 1958:38, 40). Those spokeshaves differ slightly from the Cactus Flower spokeshaves in that they exhibit stemmed, shoulderless hafting elements whereas the hafting elements of the shokeshaves recovered from Cactus Flower exhibit broad, lateral notches. Site stratigraphy, however, was poorly accounted for during excavations of Pictograph Cave because the lowest excavated level produced stemmed and lanceolate points stylistically consistent with McKean complex points; earlier, stemmed Cody complex points; and later Pelican Lake style points.

Also present in the artifact assemblage from Cactus Flower were five hafted bifaces too large and/or bulky to have functioned efficiently as projectile points. Some of these implements have broad lateral notches and obtuse shoulder angles, and they superficially resemble large Duncan points. Stylistically similar hafted bifaces tend to be associated with archaeological complexes of the early and middle portions of the Middle Prehistoric period and have been previously noted (e.g. Davis 1976:45-48; Frison and Wallker 1984; Heffington 1985; Millar 1978; Quigg 1986; Ramsay 1993).

As with projectile points, virtually all materials used for stone artifacts are available locally. Quartzites and argillites were preferred for heavy duty cutting, chopping, or hammering implements, whereas cryptocrystalline silicates were selected for fine edge cutting and scraping implements.

7.3 *Activity Floor Analysis*

Hearth and pit features of the McKean complex component are summarized

in Table 26. In total, 19 surface hearths, 21 excavated, basin shaped hearths, and three excavated pits with vertical sides and generally flat bottoms were recorded during excavations. Ash and charcoal was associated with 34 hearths; only ash was present in six of the hearths; and charcoal in three basin hearths. The fill from all but 13 hearths contained lithic debitage and bone fragments. No spatial pattern of features associated with a given activity floor could be identified. However, activity patterning evidences observed on the occupation floor of level XIII suggest that each debris concentration forms a circular pattern around the peripheries of surface hearths (Brumley 1975:175). An additional feature partially exposed during excavations of level VI was a clustering of relatively large, unmodified stones arranged in a circular pattern around a hearth. That feature was interpreted as possibly the remains of a tipi ring (Brumley 1975:19, pers. comm. 1994). Stone circles have also been documented in probable association with McKean complex materials at the Cranford site (DlPb-2) in south central Alberta (Stuart 1990), and in positive association at the Shand Ash storage site (DgMr-26, DgMr-50) in southern Saskatchewan (Keisig 1993). In addition Finnigan (1982) reported on work conducted at site EdOp-1 in southeastern Alberta. That site contains a series of tipi rings arranged in a camp circle formation on the northeast side of a large medicine wheel called the British Block cairn. McKean phase point fragments, as well as later points styles, were recovered from the shallowly buried activity floor associated with the camp circle. Brumley and Dau (1988:32) suggested that the apparent McKean phase point association at EdOp-1 provided some

Table 26: Heating/cooking facility and excavated pit data from the McKean complex component at the Cactus Flower site.

Surface Shape	Profile Shape	Stone Filled/ Lined	Fracture Pattern of Stones	Surface Diameter (cm)	Pit Depth (cm)	Fill		
						Faunal Remains	Flakes or Artifacts	Charcoal or Ash
Circular	Basin	Filled	--	100	6	--	--	Charcoal staining
Oval	Basin	Some FCR	--	204 x 112	40	Bone frag	Flakes	Ash and charcoal
Irregular	Surface	Some FCR	--	80	3	--	Flakes	Ash and charcoal
Oval	Vertical sided	Some FCR	--	162 x 70	48	Bone frag	--	Ash and charcoal
Irregular	--	--	--	90 x 70	3	--	--	Ash and charcoal
Irregular	Basin	--	--	220	16	--	--	Ash and charcoal
Oval	Surface	--	--	51 x 46	1	Bone frag	--	Ash and charcoal
Ovate	Basin	--	--	79	--	--	--	Ash and charcoal
Circular	Irregular	--	--	264	29	Bone frag	Flakes	Ash and charcoal
Irregular	Surface	Some FCR	--	67	--	--	--	Ash and charcoal
Ovate	Basin	--	--	86	12	--	Flakes	Ash and charcoal
Irregular	Basin	Some FCR	--	117 x 70	5	Bone frag	--	Ash and charcoal
Irregular	Basin	FCR	--	144 X 121	31	Bone frag	Flakes	Ash and charcoal
Irregular	Surface	--	--	--	--	--	--	Ash and charcoal
Ovoid	Surface	FCR	--	120 x 88	--	Bone frag	Flakes	Ash and charcoal
Circular	Surface	FCR	--	73	--	Bone frag	Flakes	Ash and charcoal
Circular	Basin	FCR	--	104 x 74	8	Bone frag	Flakes	Ash and charcoal
Irregular	Surface	FCR	--	88	5	Bone frag	Flakes	Ash and charcoal
Circular	Basin	FCR	--	52	5	--	--	Ash and charcoal
Irregular	Surface	FCR	--	88	2	Bone frag	--	Ash and charcoal
Ovate	Basin	FCR	--	80	15	Bone frag	Flakes	Ash and charcoal
Ovate	Surface	FCR	--	--	--	--	Large Qtzte flakes	Ash & charcoal staining
Circular	Surface	FCR	--	110	4	Bone frag	Flakes	Ash and charcoal

Table 26: Continued

Surface Shape	Profile Shape	Stone Filled/ Lined	Fracture Pattern of Stones	Surface Diameter (cm)	Pit Depth (cm)	Fill		
						Faunal Remains	Flakes or Artifacts	Charcoal or Ash
--	Basin	FCR	--	60	20	--	Flakes	Charcoal
Circular	Basin	FCR	--	98	13	Bone frag	Flakes	Charcoal
Irregular	Surface	--	--	30	--	Bone frag	--	Ash & charcoal staining
Circular	Surface	FCR	--	65	3	--	Flakes	Ash and charcoal
Circular	Basin	--	--	75	10	Bone/shell frag	Flakes	Ash
--	Surface	FCR	--	125	2	Bone frag	Flakes	Ash
Circular	Basin	FCR	--	75	6	Bone frag	Flakes	Ash and charcoal
Circular	Surface	FCR	--	110	3	Bone frag	Flakes	Ash
Irregular	Surface	FCR	--	89 x 50	1	Bone frag	Flakes	Ash
Ovate	Surface	FCR	--	65 x 55	1	Bone frag	Flakes	Ash
Irregular	Basin	FCR	--	68	9	Bone frag	Flakes	Ash and charcoal
Ovate	Surface	FCR	--	118 x 75	5	Bone frag	Flakes	Ash
Ovate	Surface	FCR	--	95 x 65	1	Bone frag	Flakes	Ash and charcoal
Ovate	Basin	FCR	--	65 x 55	6	Bone frag	Flakes	Ash and charcoal
Circular	Vertical sides	FCR	--	140	95	Bone frag	--	--
Irregular	Basin	FCR	--	100 x 65	25	Bone frag	Flakes	Ash and charcoal
Circular	Basin	FCR	--	45	13	Bone frag	Flakes	Ash and charcoal
Ovate	Basin	FCR	--	80 x 68	7	Bone frag	Flakes	Ash and charcoal
Circular	Basin	FCR	--	70 x 67	8	--	Flakes	Ash and charcoal
Oval	Vertical sided w/flat bottom	--	--	93 x 52	60	--	--	Ash and charcoal
Circular	basin	--	--	47	14	Bone frag	Flakes	Ash and charcoal

Data obtained from Brumley (1975:20-35).

EdOp-1 provided some evidence that by McKean phase times at least, "... aboriginal groups in the area were operating at a level of social order and complexity closely equivalent to historic aboriginal Plains groups."

7.4 *Microfloral and Macrofloral Analysis*

Microfloral analysis of sediments in the site and macrofloral analyses of feature fills were not implemented as part of the data recovery program at the Cactus Flower. Paleoclimatic evidence and questions concerning degree of vegetal food processing at the Cactus Flower site could thus not be discussed. As noted in Table 25, however, grinding stones were not identified as part of the artifact assemblage. These items are common among McKean complex artifact assemblages farther south, and are believed to be associated with intensive plant processing activities (Mulloy 1954; Keyser 1986).

7.5 *Faunal Remains*

Faunal remains recovered from the McKean complex component (Table 27) indicate that bison (*Bison bison*) is the most common species represented at the Cactus Flower site. Pronghorn comprise the second most common species amongst the faunal remains, but compared with the quantity of bison bone, pronghorn remains are infrequent. Small birds, small mammals, and freshwater fishes and clam are also represented throughout the McKean complex component, but so sparing is their presence that they may have been brought to the site by other predators/scavengers. Brumley (1975:92) suggested that bison hunting methods of the McKean complex occupants at Cactus Flower was effected by a handful of individuals going out to kill a small number of animals at

Table 27: Summary of faunal remains recovered from the McKean complex component at the Cactus Flower site.

Scientific Name	Common Name	MNI
Bison bison	bison	40
Antilocapra american	pronghorn	6
Odocoileus hemionus	mule deer	1
Canis familiaris	domestic dog	5
Vulpes velox	kit fox	1
Sylvilagus sp.	cottontail rabbit	3
Lepus sp.	jack rabbit	1
Unios sp.	fresh water clam	4
--	sparrow	1
Class aves	small raptor	1
Quiscalus quiscula	common grackle	2
Class pisces	freshwater fish	1

Data obtained from Wilson (1975:201-221) in Brumley (1975)

a time, then transporting selected remains back to the site. A frequency analysis of recovered bison bones from the site, illustrated a substantial lack of vertebrae and crania and provides partial support for Brumley's hypothesized hunting strategy. The implication of the bone frequency analysis is that bison were killed some distance from the site and primarily the elements associated with the greatest quantities of food and fat (limb elements) were transported back to the campsite.

Seasonally sensitive faunal elements of naturally shed, deciduous canid teeth, and full-term fetal or neonatal bison remains were recovered during excavation of the McKean complex component. Those elements provide good evidence that the site was occupied by McKean complex peoples during the early spring to late fall. In considering the seasonally sensitive elements, Wilson (1975) suggests that the whelping season of prehistoric, domesticated canids likely paralleled that for wild canids-- April to June. Similarly, Wilson (1975) places the calving season of bison at the same time.

7.6 *Chronometric Analysis*

Radiocarbon dates obtained from four of the seven McKean complex occupations cluster between 3500 to 4500 years B.P. A charcoal sample and a bone sample taken from occupation IV yielded respective dates of 3620 ± 95 B.P. and 3675 ± 80 B.P. In addition, a bone sample and a charcoal sample taken from occupation VI produced respective dates of 3890 ± 160 B.P. and 3615 ± 95 B.P. Stratigraphically deeper, and presumably older, occupation VIII yielded a date 4130 ± 85 B.P. Surprisingly, the deepest occupation level dated

(IX) yielded a date of 2130 ± 130 B.P. This date was obtained from a charcoal sample collected as fragments scattered across part of the exposed living floor of occupation IX. The date was considered erroneous by Brumley (1975) and was rejected as accurately representing the time of human occupation. All of these dates are summarized in the appendix of this thesis.

7.7 *Summary*

Comparatively large scale excavations were carried out at Cactus Flower. The artifacts and features found during excavation suggest the site was used primarily as a communal campsite where a variety of activities took place. Noteworthy in the records from Cactus Flower is the total lack of grinding stones and milling slabs generally associated with intensive plant processing. Brumley (1975) suggested that the absence of grinding stones north of the Milk River differentiates the plant processing McKean groups of the south from the big game hunters of the north. The data from Cactus Flower do suggest that McKean complex peoples on the Canadian Plains were largely big game hunters focusing on the procurement of bison. No paleoethnobotanical studies, however, were conducted on the hearth fills from the site. If they had been conducted, additional information about the dependency of McKean complex peoples in the general area to plant resources would have been provided. The Cactus Flower site, in common with the previously discussed sites, provides evidence that McKean complex peoples frequently re-occupied campsites.

8.0 THE CROWN SITE

8.1 General Site Setting

Situated at the Plains/Boreal Forest boundary on the southern bank of the South Saskatchewan River in east central Saskatchewan, the Crown site currently represents the northern most extension of the McKean complex (Figure 11). Although the Crown site is currently located just inside the

Figure 11: General setting of the Crown site (FhNa 86). Site is on the terrace in center of photograph (Arrow). Photo courtesy of Western Heritage Services.

Boreal Forest, at the time of occupation by McKean complex peoples the site was most likely at the boundary between the Plains and Parkland (Quigg 1986:103).

This well stratified, multicomponent, multiple occupation campsite was intermittently settled from McKean times through the Late Prehistoric period.

Similar to the geomorpological processes identified at the Cactus Flower site the stratified nature of cultural deposits in site FhNa-86 can be attributed to fairly rapid episodes of alluvial deposition. Of particular interest at the Crown site is that the lower three cultural strata, associated with the McKean complex, were reported by the excavator to have produced only McKean Lanceolate points and together were designated by Quigg as composing the site's McKean unit. Each of the three cultural strata composing the "McKean unit" was reported to be separated by a layer of culturally sterile alluvium, and in turn, the McKean unit was separated from the next highest series of cultural strata by 20 cm of alluvial deposition (Quigg 1986:26-28). This next highest series of cultural strata also consisted of at least three distinct strata and these strata produced, according to Quigg (1986:121), eighteen complete and fragmentary Hanna points as well as an Oxbow point and a Mummy Cave complex point. This series of cultural strata were designated by Quigg as constituting the site's Hanna unit. " The points [Hanna] were discovered in a series of thin organic layers, roughly 20 cm above the organic layers containing McKean Lanceolate points (Quigg 1986:124)." The presence of the Oxbow point and the Mummy Cave complex point is explained by Quigg as either coeval cultural contact within the region, or curation of the Oxbow and Mummy Cave points by the "Hanna" groups who occupied the Crown site.

Two distinct blocks of excavation units, identified by Quigg as the east and west blocks, were established during mitigation work at the Crown site. In the east block Quigg identified the Hanna unit as beginning at 20 cm below the

ground surface (BS) and extending to a depth of 60 cm. From approximately 60 cm to 75 cm BS is a deposit of culturally sterile alluvium. The McKean unit was identified between approximately 75 cm and 125 cm BS.

In the east block a total of 161 square meters were layed out on the surfaces of the various cultural and natural deposits. Fifteen square meters were allocated to test the lowest identified occupation level (unidentified as to cultural complex); 33 square meters were layed out on the surfaces of the defined McKean and Hanna occupation floors and the culturally sterile deposit separating these latter two cultural units; and 47 square meters were layed out on the surface of the Late Prehistoric component (Quigg 1986: 41, 49, 106, 112, 166). Total area (horizontal and vertical) excavated within each of the established one meter units, however, was not available.

In the west block, Quigg suggested that the Hanna unit lays 20 to 42 cm BS. The culturally sterile deposit of alluvium which separates his Hanna and McKean units extends vertically from approximately 42 cm to 50 cm BS. At 50 cm the identified McKean unit begins and extends downward to approximately 80 cm BS (Quigg 1986:26-28).

In the west block a total of 114 square meters were layed out on the surfaces of the various cultural and natural deposits. Forty square meters were layed out and excavated on the surface of the Late Prehistoric component. Thirty seven square meters were layed out on the surfaces of the defined McKean and Hanna occupation floors, but it is unclear if excavation units were established on the surface of the defined culturally sterile stratum within the west block. The

lowest identified cultural occupation floor was not excavated within the west block (Quigg 1986: 41, 49, 106, 112, 166). Again, total area (horizontal and vertical) excavated within each of the established one meter units was not available.

8.2 Artifact Assemblages

Tables 28 and 29 summarize the metric and nonmetric data for each of the identifiable projectile points and point fragments excavated within the "McKean" component and the "Hanna" component. Figures 12 and 13 illustrate the "McKean" and "Hanna" projectile points recovered during excavations at the Crown site. Only the top two rows of Figure 12, however, represent the recovered projectile points from Quigg's McKean unit. I agree with Quigg's interpretation that all identifiable points recovered from his McKean unit are McKean Lanceolate in form (Figure 12.1-5); however, several of the points (Figure 13.8, 9, 11, 12) Quigg identified as Hanna points from the Hanna unit are stylistically consistent with what Wheeler (1954) considered the Duncan type point.

After analyzing Quigg's data, I find that the distinction between his defined McKean and Hanna units is not so clear as he suggested. In the east block, a single Hanna point was recovered from 20 cm to 30 cm BS. Conversely, from a depth of 70 cm to 80 cm, a single McKean Lanceolate point was recovered. No diagnostic cultural materials were recovered from 30 to 40 cm, but at a depth of 40 cm to 50 cm three Duncan and Two Hanna points were recovered, and at a

Table 28: Metric and nonmetric observations on projectile points recovered from the McKean unit at the Crown site.

Type	Basal Shape	Raw Material	Length (mm)	Width (mm)	Thickness (mm)	Stem Length (mm)	Stem Width (mm)	Basal Width (mm)	Height of Notch (mm)	Blade Outline
L	--	Ccs	34	14.4	6.2			--		ST
L	--	Ccs	--	--	4			--		CX
L	--	Ccs	30	16.6	5.4			--		CX
L	--	Ccs	34	19.1	4.4			--		CX
L	--	--	--	--	--			--		ST

Abbreviations:

Type: L = McKean Lanceolate
Material Type: Ccs = Cryptocrystalline silicate
Blade Outline: CX = Convex; ST = Straight

Data obtained from Quigg (1986:60-63)

Table 29: Metric and nonmetric observations on projectile points recovered from the Hanna unit at the Crown site.

Type	Basal Shape	Raw Material	Length (mm)	Width (mm)	Thickness (mm)	Stem Length (mm)	Stem width (mm)	Basal Width (mm)	Height of Notch (mm)	Blade Outline
O	N	Ccs	9.6	18.8	4.9	9.6	17.6	15.3	--	CX
MC	ST	Ccs	45.2	19.7	5.8	10.7	15.8	14.3	--	ST
H	--	Ccs	25.3	--	6.9	9	--	--		CX
H	ST	Ccs	30.7	18.7	5.6	9.7	10.2	14.8		--
H	--	Ccs	32.4	20.6	5.9	11	13.5	13.5		--
D	--	Diatomite	36.6	20.7	5.9	--	--	--		CX
H	CX	Ccs	37.7	20	7.7	11.7	--	--		--
D	--	Qtz	43.9	--	9	15	--	--		--
H	--	Ccs	--	20.1	--	11	17.1	17		--
D	--	Ccs	--	21.2	8.7	14.7	--	--		ST
D	--	Qtz	--	23.9	9.6	14.4	19.5	18		ST
H	--	Ccs	--	18.8	--	--	--	--		--
H	N	Welded Tuff	--	25.5	9.2	15.1	--	--		ST
H	ST	Ccs	35.6	20.5	4.1	13.5	17.5	15.1		ST
H	--	Qtz	--	--	10	14.2	--	--		CX
H	--	Ccs	25.1	17.0	5.9	9.3	14.8	13.9		CX

Abbreviations:

Type: O = Oxbow; MC = Mummy Cave; D = Duncan; H = Hanna

Material Type: Ccs = Cryptocrystalline silicate; Qtz = Quartz; Slstn = Silicified siltstone

Blade Outline: CX =Convex; ST = Straight

Data obtained from Quigg (1986:121-124)

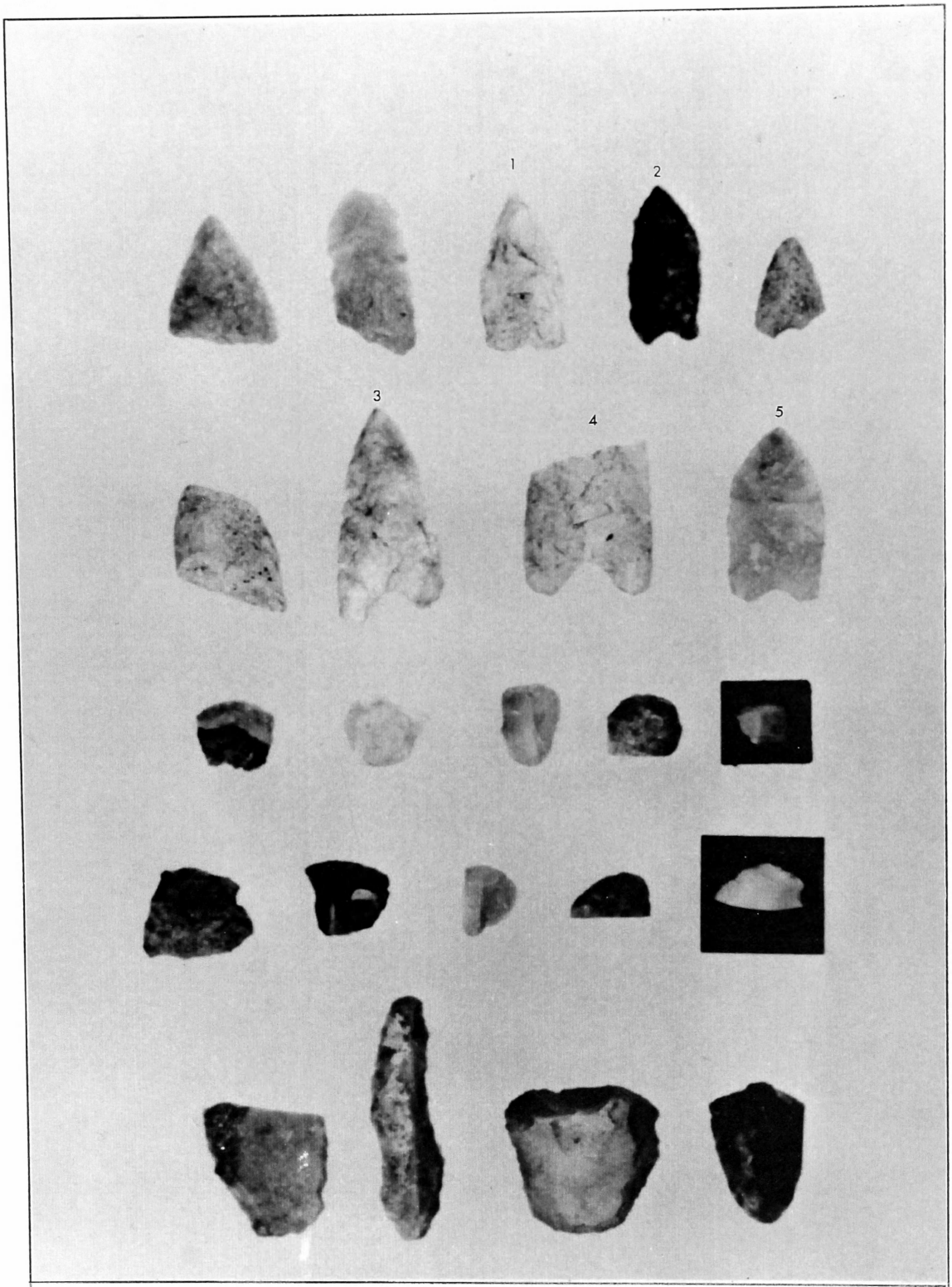


Figure 12: Select artifacts recovered from the "McKean" unit at the Crown site (FhNa-86). Photo courtesy of Western Heritage Services.

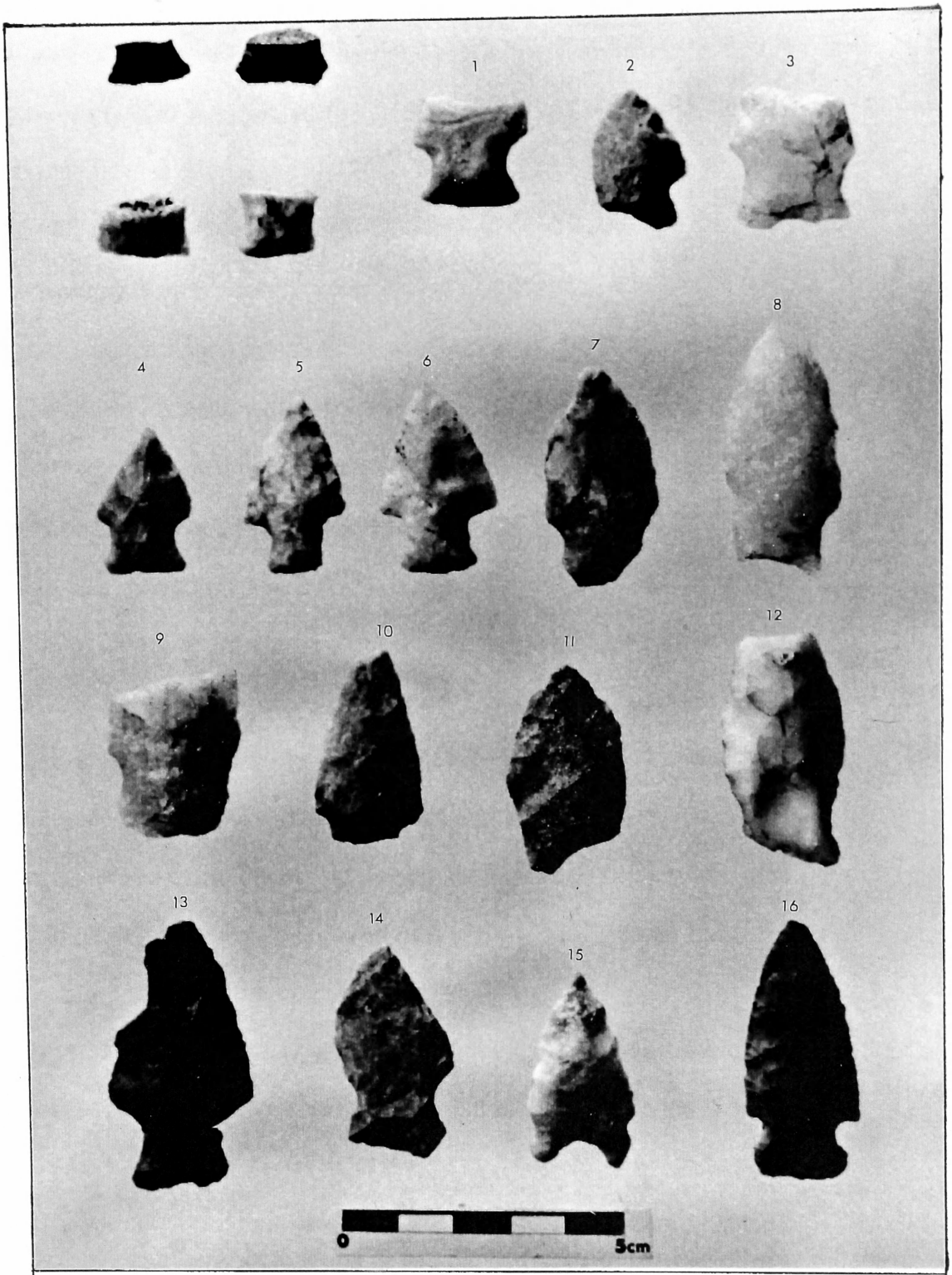


Figure 13: Projectile points recovered from the "Hanna" unit at the Crown site (FhNa-86). Photo courtesy of Western Heritage Services.

depth of 50 cm to 60 cm, one McKean Lanceolate, one Duncan, and one Hanna point were recovered (Table 30). Quigg claims that McKean Lanceolate points were recovered only from a depths greater than 70 cm BS in the east block (Quigg 1986:28, 47, 62), but according to the data presented in the site report, no diagnostic artifacts were recovered below a depth of 80 cm.

From the west block a single Hanna point was recovered from 30 cm to 40 cm BS, and another Hanna point was recovered from 50 to 60 cm. Two McKean Lanceolate points were recovered from 40 to 50 cm BS, and two additional McKean Lanceolate points were recovered at 50 to 60 cm BS (Quigg 1986:123) (Table 31). Quigg (1986:26, 111), however, remarked that in the west block no Hanna materials were recovered deeper than 50 cm, and that McKean Lanceolate points were recovered only from 50 cm to 80 cm BS. Although it appears that the distinctness of the Hanna and McKean units at the Crown site is tenuous at best, the various data collected from the site are presented here as representing either the defined Hanna or McKean unit, even though these two units might be better classified as one distinct component of the site.

Four of five points which I could clearly identify as McKean Lanceolate are composed of CCS. No material type information or metric data was provided for the fifth McKean Lanceolate point. Three of the five sufficiently intact to provide complete lengths, produced a mean length of 33 mm with the longest specimen being 34 mm and the shortest being 30 mm. Mean width of the four identified McKean Lanceolate points is 16.7 mm and mean thickness is 5 mm.

Table 30: Vertical distribution of McKean Lanceolate, Duncan and Hanna points recovered within the east excavation block at the Crown site.

Point Type	Depth in cm below the ground surface													
	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-110	110-120	120-130	130-140
McKean Lanceolate	Late Prehistoric					1	Sterile	1					Bottom Occupation	Gravels
Duncan					3	1								
Hanna			1		2	1								
			◀— Hanna Unit					◀— McKean unit						

Data obtained from Quigg (1986:26-28, 47, 62)

Table 31: Vertical distribution of Middle Prehistoric period points recovered within the west excavation block at the Crown site.

Point Type	Depth in cm below the ground surface													
	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-110	110-120	120-130	130-140
McKean Lanceolate	Late Prehistoric				2	2								
Duncan														
Hanna					1	1								
Oxbow			1											
Mummy Cave					1									
				◀—Hanna Unit		◀— McKean unit								

Data obtained from Quigg (1986:26-28, 111, 123, 126)

Although Quigg (1986) did not identify Duncan points among the recovered artifacts, four of the points from his Hanna unit (Figure 13.8, 9, 11, 12) appear to fit Wheeler's (1954) definition quite well, and are considered here as such. Two of the Duncan points are made of quartz, one is made of CCS and one is made of diatomite. Three of the four Duncan points are sufficiently intact to provide complete lengths. Mean length of the points is 34 mm with the longest specimen being 44 mm and the shortest 21 mm. Mean width of the four Duncan points is 21.7 mm and mean thickness is 8.3 mm.

With the exception of the possible Oxbow point (Figure 13.15) and the Mummy cave complex point (Figure 13.16) recovered within the McKean complex component of the site, the remainder of the projectile points illustrated in Figure 13 appear to best fit the definition of a Hanna point (Figure 13.1-7, 10, 13, 14). Seven of these points are made of CCS; one of the points is made of silicified siltstone, and another is of welded tuff (Quigg 1986:123). A mean length of 31.1 mm was calculated for six of the Hanna points determined to be sufficiently complete. Mean blade width of eight of the Hanna points is 20.2 mm, and mean thickness is 6.9 mm.

Tables 32 and 33 summarize the data regarding antler, bone and shell tools recovered from the McKean and Hanna occupations. The basal portion of an elk antler removed from the beam just below the brow tine was recovered from the Hanna unit. The function of this artifact is uncertain, but may have been associated with lithic knapping activities. A dentalium shell fragment was found in association with the McKean component. The closest known source to

Table 32: Summary by number and type of antler, bone and shell artifacts recovered from the McKean unit at the Crown site.

Bone Awl	Blunt Ended Bone Tools	Unidentified Bone Tool Fragments	Bone Beads	Antler Tools	Shell (#)	Artifacts (Type)
0	2	2	0	0	1	Dentalium shell bead

Data obtained from Quigg (1986:78-80)

Table 33: Summary by number and type of antler, bone and shell artifacts recovered from the Hanna unit at the Crown site.

Bone Awl	Blunt Ended Bone Tools	Unidentified Bone Tool Fragments	Bone Beads	Antler Tools	Shell (#)	Artifacts (Type)
0	3	0	0	0	0	

Data obtained from Quigg (1986:140-143)

Saskatchewan is in the waters off the coasts of Washington and British Columbia. This dentalium fragment may suggest that far reaching trade systems were operating by at least McKean times.

The nonprojectile point stone artifacts of the McKean complex component (Tables 34 and 35) are typical at temporary campsites where activities such as tool maintenance and production, food preparation, and other domestic activities occur. All culturally modified or transported lithic materials present throughout Quigg's McKean and Hanna occupation levels are obtainable locally. Quartz, granite, and andesite were primarily selected for stone hammers, and delicate cutting and scraping implements are predominately of cryptocrystalline silicates.

8.3 Activity Floor Analysis

Only three surface hearths (Table 36) were exposed during excavations of Quigg's McKean unit. Firecracked rock (FCR), exhibiting fracture patterns consistent with those attributed to stone boiling (i.e., rapid cooling), was present in limited quantities, across the activity floors but did not contribute to a feature and was not directly associated with any of the three hearths. Only two features were identified within Quigg's Hanna unit. The first consisted of a rather large surface hearth with FCR concentrated within the margins of the oxidized stain. The second consisted of a circular concentration of FCR which apparently had been dumped Immediately adjacent to the large surface hearth (Table 37). Fracture patterns of FCR from the Hanna unit are consistent with those generated through stone boiling activities.

Table 34: Summary by number and type of select stone artifacts recovered from the McKean unit at the Crown site.

Tool Category	Raw Material Categories																		
	Slstn	KRF	Ccs	Sw	Diorite	Porcelanite	Quartzite	Quartz	Argillite	Slate	Basalt	Obsidian	Ironstone	Felsic lava	Limestone	Diatomite	Granite	Mica schist	Indeterminate
Bifaces	1		2	4			2	1					1						
MRST	1		24				2	7						1	1	3	1		2
Endscrapers			12																
Spokeshaves																			
Gravers																			
Cores	1		31				1	8							1			1	
Core tools																			
Drills																			
Hammerstones					5			1						1			2		
Unifaces			3			5		1								1			
McKean L.			4																1

Abbreviations:

Material Type: Slstn = Silicified siltstone; KRF = Knife River flint; Ccs = Cryptocrystalline silicate; Sw = Silicified wood

Tool Type: MRST = Marginally Retouched Stone Tool; McKean L. = McKean Lanceolate point

Data obtained from Quigg (1986:55-75)

Table 35: Summary by number and type of select stone artifacts recovered from the Hanna unit at the Crown site.

Tool Category	Raw Material Categories																		
	Slstn	KRF	Ccs	Andesite	Diorite	Welded tuff	Quartzite	Quartz	Argillite	Slate	Rhyolite	Obsidian	Ironstone	Felsic lava	Limestone	Diatomite	Granite	Mica schist	Indeterminate
Bifaces	1		23			1	2	5								4			
MRST			24				2	4			1			2	1	2			
Endscrapers			15				1	1						1					
Spokeshaves																			
Gravers																			
Cores			21				6	3								1			
Core tools																			
Drills																			
Hammerstones				1				2									1		1
Unifaces			1																
Oxbow point			1																
MC point			1																
Duncan points			1					2								1			
Hanna points			7			1		1											1

Abbreviations:

Material Type: Slstn = Silicified siltstone; KRF = Knife River flint; Ccs = Cryptocrystalline silicate

Tool Type: MRST = Marginally Retouched Stone Tool; MC point = Mummy Cave complex

Data obtained from Quigg (1986:116-140)

Table 36: Heating/cooking facility data from the McKean unit at the Crown site.

Surface Shape	Profile Shape	Stone Filled/ Lined	Fracture Pattern of Stones	Surface Diameter (cm)	Pit Depth (cm)	Fill		
						Faunal Remains	Flakes or Artifacts	Charcoal or Ash
Ovoid	Surface	--	--	80		Canid		
Elongated	Surface	--	--	90 x 45				Ash
Elongated	Surface	--	--	100 x 55		Bone frag	1 McKean L. point	

Data obtained from Quigg (1986:47-53)

Table 37: Heating/cooking facility and feature data from the Hanna unit at the Crown site.

Surface Shape	Profile Shape	Stone Filled/ Lined	Fracture Pattern of Stones	Surface Diameter (cm)	Pit Depth (cm)	FILL		
						Faunal Remains	Flakes or Artifacts	Charcoal or Ash
Irregular	Surface		Rapid cooling	150 x 100		Bone frag	Flakes	--
Circular	FCR pile		Rapid cooling	--		--	--	--
Rectangular	Vertical sides			80 x 30	--	Human burial		Charcoal and calcined bone

Data obtained from Quigg (1986:111-115)

In addition to the two heating/cooking features, a human burial was encountered immediately below Quigg's Hanna unit, and is believed to be associated with the Hanna unit occupants (Quigg 1986:114). The burial consisted of the corpse of a juvenile that had been placed inside a shallow, rectangular pit . That burial is summarized in Table 37 and is fully discussed in Chapter 9 of this thesis.

8.4 Microfloral and Macrofloral Analysis

An analysis of the carbonized plant fossil record and pollen record was not made at the Crown site. Such data may have provided more information concerning season the site was occupied, the plant resources being selected by the site's inhabitants, and climatic conditions at the site over the past four millennia.

8.5 Faunal Remains

The faunal remains from the McKean and Hanna units at the Crown site are summarized in Tables 38 and 39. Faunal remains from both of the McKean complex components are consistent with fauna expected to occur in a major ecotone such as a zone between the Plains and Boreal Forest. Bison, moose, and elk (wapiti) are apparently equally represented (although in limited numbers) throughout the McKean complex components as are smaller fur bearing animals and avi-fauna. The small, yet diverse faunal record from the McKean complex component at the Crown site, suggests that the McKean complex occupants were very likely organized at the band level, with only a handful of individuals leaving camp to hunt and retrieve game. The one strong

Table 38: Summary of faunal remains recovered from the McKean unit at the Crown site.

Sclentific Name	Common Name	MNI
Bison bison	modern bison	3
Alces alces	moose	2
Cervus candensis	wapiti	2
Canis familiaris	domestic dog	3
Castor canadensis	beaver	3
Mephitis mephitis	skunk	2
--	rabbit	3
Pedioecetes phasianellus	sharp-tailed grouse	1
--	sucker	--
Unios sp.	fresh water clam	--
Aves class	unidentified bird	1

Data obtained from Quigg (1986:80-97)

Table 39: Summary of faunal remains recovered from the Hanna unit at the Crown site.

Scientific Name	Common Name	MNI
Alces alces	moose	2
Cervus canadensis	wapiti	--
Odocoileus sp.	deer	1
Bison bison	* modern bison	>2
Canis familiaris	dog	2
Lepus americanus	rabbit	1
Castor canadensis	beaver	2
--	unidentified rodent	1
Ursus americanus	black bear	1
Unios sp.	freshwater clams	26

* Fetal and adult bison remains represented

Data obtained from Quigg (1986:143-156)

indicator of a seasonal use episode at the site was the presence of fetal bison bone recovered from the Hanna unit. The developmental stage of the fetal remains suggests a late winter/early spring occupation for at least one episode of cultural occupation at the site.

8.6 Chronometric Analysis

A series of 11 radiocarbon dates were obtained from the "McKean" and "Hanna" units. From level 7 of the east block, two dates of 4180 ± 115 and 4295± 85 B.P. were obtained. Both of these dates compared favorably with the dates of 4330 ± 115, 3825 ± 75, 3825 ± 90, and 3995 ± 90 B.P. dates obtained from levels 13, 11, and 10 respectively from the west block. The one obvious problem with Quigg's assigning these dates to peoples having a McKean Lanceolate technology is that from level 6, Hanna and McKean Lanceolate points (n=2 each) were equally represented, whereas only one diagnostic artifact, a McKean Lanceolate point was recovered from level 8. No projectile points were recovered from level 7 which was originally defined as a culturally sterile deposit of alluvium.

Dates obtained from bone samples collected in the east block from levels 6, 4 and 3 (the defined Hanna unit) range as follows: 3425 ± 105, 3600 ± 80, 3300 ± 110, and 3605 ± 120 B.P. Similar to what was previously discussed, level 6 of the eastern block produced both McKean Lanceolate and Hanna points, level 4 produced no diagnostic artifacts, and only a single Hanna point was recovered from level 3. An additional date of 2010 ± 100 B.P. was obtained from a portion of antler collected from level 3 of the east block, but was rejected by Quigg

(1986:32) as being too recent. These dates are summarized in the appendix of this thesis.

8.7 Summary

The earliest occupation of the Crown site began about 4300 years ago and continued sporadically through the Late Prehistoric period. Although Quigg defined distinct "McKean" and "Hanna" components at the site, which he suggested produced only McKean Lanceolate and Hanna points respectively, an examination of his data would seem to refute his claims. Too few diagnostic artifacts were recovered from the site, and individual strata often produced but one or two projectile points. Further, the record from the Crown site suggests that McKean Lanceolate, Duncan, and Hanna points were recovered together within three of the cultural levels. For those reasons, the Hanna and McKean units should be considered together as a McKean complex component.

Evidence from FhNa 86 suggests that McKean complex peoples hunted a variety of animals on a small scale and performed domestic activities, and produced and maintained tools to only a limited extent while at the site. Whether the site lay on the beaten path of seasonal migrants of if it was used only during anomalous years is uncertain. What the site does help demonstrate is the broad expansion of the McKean complex in the northern Plains and the tendency for McKean complex peoples to re-occupy a site several times.

9.0 MORTUARY PRACTICES

9.1 Introduction

The study of mortuary practices of past human cultures has been a significant part of archaeological study and development. As noted by Chapman et al. (1981: 1-2), "In addition to their [mortuary practices] overall frequency, the myriad variable forms in which they occur ("the diversity of cultural reaction") have ensured that data on mortuary practices have played a central role in the study of social, cultural, chronological, ethnic and racial problems."

From the previous quote it follows that within mortuary practices lay the physical remnants which reflect cultural reactions to death. The physical remnants in turn provide evidence for recurring patterns within archaeological complexes. Outlined in this chapter are traits observed for mortuary practices among the McKean and Oxbow complex and the Pelican Lake phase. That data set is compared and contrasted among the three complexes and attempts are then made to interpret any differences or similarities observed.

9.2 McKean Complex

Evidence of mortuary practices, among McKean complex peoples, comes primarily from three sites in northern Wyoming and two sites in central Saskatchewan. In 1951, during initial test excavations at the McKean site, the first identified McKean burial was located. A fragmentary cranium, believed to be from a adult female approximately 30 years of age, had been placed in a shallow pit. Associated with the burial were two *Bison bison* innominata, both of

which were heavily fragmented. The absence of post-cranial elements associated with the burial led Mulloy (1954) to suggest a secondary burial situation. The term secondary burial, in this case, refers to the interment of an individual's remains, after the corpse has been left exposed to the elements for an indefinite period of time.

A second human burial at the McKean site was discovered during the 1983 excavations. Cranial fragments, a mandible, a scapula, and a humerus had been placed inside a shallow pit which measured approximately 1 meter in diameter, and 45 centimeters in depth. Like the first burial discovered at the McKean site, this burial was also suggested to be a secondary interment. Although the sex of the individual was indeterminate, the age of the individual was estimated to be 5 years. Associated with the burial were a hematite slab and a fragment of a deer innominate (Haspel and Wedel 1985:105-106).

The third Wyoming burial associated with McKean complex peoples comes from the Dead Indian Creek site in northwestern Wyoming. Similar to the two previously discussed McKean burials, the fragmentary, post-cranial remains of a child, were placed in a shallow pit directly below the identified activity floor. No grave goods were recognized in association with the burial at Dead Indian Creek, and although sex of the individual was indeterminable, an age of eight or nine years was assigned to the child based upon development of a single molar, and epiphysial suture closure rates (Gill 1984).

The fourth McKean complex burial to be discussed was discovered during the 1981 excavations at the Crown site in east central Saskatchewan. Beneath

what Quigg (1986) identified as the lowest Hanna occupation surface, the skeletal remains of a juvenile less than eight years old were recovered (Quigg 1986:114). At the time of burial the individual was interred face up in an extended position with arms placed alongside the body, and the head oriented toward true north. The individual was then placed in an excavated, rectangular pit measuring 80 cm N/S x 30 cm E/W. Although no recognizable grave goods were associated with this burial, the pit fill was largely composed of organics and small fragments of burned bone -- probably the fill from nearby hearths.

The final McKean complex burial to be discussed in this study was at the Graham site (FaNq-30) in south central Saskatchewan. The site lays in a cultivated field and, at the time of testing, it was identifiable as a small area containing oxidized soil, burned and unburned bone fragments, and chipped stone tools and debitage. Walker (1984:140) mentioned that occasional artifacts were found in the tilled soils beyond the hearth, which may or may not indicate the presence of a habitation site. Test excavation of the oxidized soil revealed the remains of a pit hearth within which an individual's remains had been cremated. Recovered during excavation and in direct association with the cremated remains were two antler artifacts interpreted as a soft hammer and a pressure flaking tool. Several chipped stone artifacts, including a Duncan point, a large hafted biface, 10 ovoid to irregular shaped bifaces, a core, and 21 pieces of debitage were also recovered in association with the burial (Walker 1984:142). The recovered bone and bone fragments were later identified as human and bison. Based on bone warpage patterns and cut marks on some of

the human bone, Walker (1984:141) suggested that the individuals remains were disarticulated and cremated while soft tissue was still attached to the bones.

9.3 Oxbow Complex

Comparing the four previously discussed McKean burials to burials from preceding, contemporaneous, and succeeding cultural sequences demonstrates some differences. From his study of the Oxbow complex, Melton suggested that with the introduction of Oxbow to the northwest Plains, we have evidence for "...the beginning of large-scale mass interments on the northern Plains... [and] at least one case where a related group reused the same mass burial site for a considerable period of time (Melton 1988:137)." The site to which Melton referred is the Gray Burial site (EcNx-1a) in southwestern Saskatchewan. There, Oxbow peoples used the site as an ossuary for approximately 2200 years (Millar 1981). Individual remains were placed inside excavated pits and were covered with the disturbed materials. Single and multiple interments; flexed, bundled, or extended primary and secondary interments; and the remains of juveniles and adults were all identified within the Gray Burial site. Associated grave goods varied from none to many. Items associated with ossuary included chipped stone tools, gorgets and pendants of locally available clam shell and marine shell imported from the east coast, copper beads, and the remains (largely limb elements) of a variety of animals (Millar 1978). Red ocher (hematite) was common within the individual burial units and was generally mixed with the burial pit fills and/or rubbed on the long

bones and crania (Millar 1978, 1981:105). Millar (1981:106) also noted a tendency within the Gray Burial site for primary interment of juveniles and secondary interment of adults.

Two burials from east central Saskatchewan which are suggested as probable Oxbow sites are the Greenwater Lake Burial and St. Denis Burial (Millar 1981:104). Both burials appear to be primary, single adult interments where the individuals were placed within excavated pits in extended positions. The only associated grave good was red ochre rubbed on some bones of the Greenwater Lake site and intermixed with the burial pit fill at the St. Denis site.

Oxbow mortuary practices contrast with those inferred from burials of juveniles among McKean complex peoples. With two of the three McKean complex juvenile burials being secondary and the third being primary, however, the data are too limited to make any kind of reasonable comparison.

Data comparing interment practices for adults between peoples using an Oxbow complex technology and those using a McKean complex technology are even more limited. Melton (1988:140) noted that throughout the Oxbow complex, adults were generally buried secondarily with the bones often being bundled prior to interment. The single McKean complex burial of an adult was also secondary in nature. It is unclear whether the remains were bundled prior to interment because at the time of discovery, they consisted only of a partial cranium. If bundling remains prior to burial was a standard part of adult interment among peoples using a McKean complex technology, a single skeletal element, such as a cranium, probably would not have been bundled.

With regard to grave goods, Millar's (1978:466-469) data suggest that when faunal remains are recovered in association with Oxbow burials those elements consist largely of limb bones. Within in two of the four previously discussed McKean burial pits, however, faunal pelvic elements were interred with the human remains. With the exception of the second McKean site burial, there appears to be no iron oxide (red ocher) associated with McKean burials. In contrast, its use is common among Oxbow burials (Quigg 1986:259-260). Walker (1984:148) identified a pattern among McKean complex peoples of interment below the activity floor of a campsite -- a trend also different from recognized Oxbow burial practices.

The one obvious difference between Oxbow and McKean mortuary sites is the ossuary represented by the Gray Burial site. Although similar burial sites are recognized within the Middle Missouri area and the eastern United States, no other archaeological group on the northern Plains is associated with such practices.

9.4 Pelican Lake Phase

Evidence for mortuary practices among the succeeding Pelican Lake phase is demonstrated by data from three sites. A human burial site near the mouth of the Wind River canyon in Wyoming contained a cache of artifacts including several Pelican Lake projectile points (Frison and Van Norman 1985:43-52). It is unclear in the referenced report if the human remains were contained within an excavated pit. Mentioned in the report, however, is that the burial was covered with 2-3 cm of sand and red ocher over which several large fires had

been built. Because only bones of the right arm and right leg were recovered, the analysts were unsure whether the individual's remains were cremated recently after death, or if the remains were cremated following exposure to the elements for a length of time. Of interest were two fragments of human bone which had been cut and polished. The excavators, however, could not determine whether the polished bone fragments came from skeletal elements of the cremated individual.

Recovered beneath a cairn at the Bracken Cairn site (DhOb-3) in southwestern Saskatchewan were the remains of three adults and two infants, with one infant being either a full term fetus or neonate. The method of burial appears to have been secondary in nature. Two separate bundles, containing the remains of the five individuals, were placed at opposite ends inside a roughly oval, excavated pit which measured 91 cm N/S x 122 cm E/W x 76 cm in depth. Crania recovered from only two of the individuals were placed inside of the pit facing west. The bones had been covered with red ocher, and a thick deposit of red ocher was placed upon the ground surface above the burial pit following backfilling (Walker 1982:10-12). Associated with the interments were several bone and stone artifacts, two freshwater clam shell gorgets, and whole and fragmentary maxillae and mandibular elements of at least nine swift fox. A ground stone pestle, a fragment of rolled copper, and a Pelican Lake style projectile point were also recovered during excavations at the burial site. A single radiocarbon date of 2465 ± 85 years before present (S-912) securely

establishes the Bracken Cairn within the expected temporal parameters of the Pelican Lake complex.

The final Pelican Lake complex burial site (EePk-272) to be discussed here was discovered in the Highwood River valley of southwestern Alberta. A roughly oval pit measuring 80 cm N/S x 150 cm E/W originally excavated along the bank of the Highwood River received the remains of two individuals -- one infant and one juvenile of approximately ten years of age. The bones had apparently been covered with red ocher and bundled, thus constituting a secondary burial situation (Brink and Baldwin 1988). Grave goods consisted of perforated bison teeth and perforated Grizzly Bear claws, freshwater clam shell beads, *Olivella baetieca* and *Dentalium sp.* shell fragments, a retouched flake, a core, a copper fragment, and a Pelican Lake style projectile point were also recovered from within the burial site. A single radiocarbon date of 2465 ± 85 years B.P. (S-1962) was obtained from the Highwood River burial site (Brink and Baldwin 1988). Several of the traits which have been identified in Oxbow, McKean and Pelican Lake burials, and are outlined in this chapter, are summarized in Table 40.

9.5 Discussion

After reviewing the previously presented data, the most distinguishing trait associated with mortuary practices among Oxbow, McKean, and Pelican Lake peoples is the ossuary (Gray Burial site). As previously noted, this trait is undocumented among other archaeological groups in the northern Plains; however, ossuary sites are recognized in the Middle Missouri area and the

Table 40: Presence/absence chart of select traits associated with mortuary practices of Oxbow, McKean and Pelican Lake peoples.

	Site Name	Trait List: Primary interment	Secondary interment	Extended burial	Flexed burial	Bundled remains	Adult remains	Juvenile remains	Burial within campsite	Ossuary site	Burial beneath cairn	Cremated remains	East coast Natica sp.	Olivella baetieca	Freshwater clam shell	Dentalium	Native copper	Hematite	Canid limb elements	Med.-Large ungulate innominata	Eagle talons	Swift fox remains
Oxbow	Gray Burial	+	+	+	+	+	+	+		+			+				+	+	+		+	
Oxbow	Greenwater Lake	+		--	--	--	+											+				
Oxbow	St. Denis	+		+			+											+				
McKean	McKean 1		+				+		+											+		
McKean	McKean 2		+					+	+									+		+		
McKean	Dead Indian Creek		+					+	+													
McKean	Crown	+		+				+	+													
McKean	Graham						+		?			+										
P Lake	Wind River Canyon	--	--				--	--			+	+						+				
P Lake	Bracken Cairn		+			+									+		+	+				+
P Lake	Highwood River		+			+								+	+	+	+	+				

Abbreviations:

-- = Insufficient data provided; + = Trait is present; ? = May or may not be present

Data obtained from Brink and Baldwin 1988; Frison and Van Norman 1985; Gill 1984; Haspel and Wedel 1985; Millar 1978, 1981; Quigg 1986; Walker 1982, 1984

eastern United States. Although grave goods at the Gray Burial were not so numerous or elaborate as within prehistoric Native American ossuary sites east of the northern Plains, this seems consistent with the recognized material culture associated with Plains adapted groups. Further evidence which suggests an eastern orientation among Oxbow peoples is the presence of native copper and marine shell within the Gray site which has its origins in the Great Lakes and northeastern coastal areas.

In general terms, Oxbow interments of human remains can take on a wide range of burial forms, and identifiable grave goods can range from varied to nonexistent. The one trait the three Oxbow sites examined in this section had in common was the presence of red ocher either in the burial pit fills or on some of the interred bones.

McKean burials can be expected to occur as either primary, extended, or secondary interments. They appear to be isolated events largely or wholly within the activity floor of a campsite. Grave goods appear to be limited with a tendency toward medium to small ungulate innominata.

Pelican Lake peoples largely buried the remains of some of their dead secondarily to leaving the bodies exposed to the elements for uncertain amounts of time. After the remains were collected, they were commonly bundled, covered with red ochre, and placed inside an excavated pit. Grave goods are common in Pelican Lake interments, and the available evidence suggests trade or contact with peoples east and west of the northern Plains. The more elaborate mortuary practices among Pelican Lake peoples, as

compared to McKean burials, may reflect modifications within the social structure of Pelican Lake peoples. Part of such change, perhaps, is reflected by more attention and emphasis upon the after-life during Pelican Lake times or, alternatively, by more status differentiation in this life. It is possible that certain elements from the socio-religious system of Oxbow complex peoples were incorporated into the system of McKean complex peoples some time around 3000 years ago.

10.0 ORIGINS

10.1 *Radiometric and Environmental Evidence*

After reviewing the radiocarbon dates available in the late 1960's for McKean sites, Syms (1969) observed that the McKean complex was encapsulated within the 3000-5000 years B.P. time frame. Syms (1969) also observed that the earliest dates for McKean came from the Big Horn basin in Wyoming -- suggesting a point of origin. The temporal range of C-14 dates, to one sigma error, compiled from several dated McKean sites throughout the northern Plains is plotted in Figure 14. The C-14 data used to produce the results of Figure 14 are summarized in the appendix of this thesis. As Figure 14 demonstrates, the majority of McKean complex dates do fall comfortably within the margins of 3000-5000 years before present; however, several outliers are present. Of interest for McKean sites from Wyoming to Saskatchewan is the relatively tight clustering of radiocarbon dates between 4700 and 3000 years B.P. (Figure 14). Further, the margins of error for the earliest dates for McKean sites in Wyoming, Montana, Alberta, and Saskatchewan overlap. This suggests that the spread of the McKean complex throughout most of the northwestern Plains was rapid and successful. Also of interest are the dates from the southern portion of the northwestern Plains. Although several dates are available from Colorado, those dates cluster between 4000 and 3000 years B.P. This may suggest that the McKean complex was established in the central and northern portions of the northern Plains for approximately 700 years before its establishment in the southern portion of the region.

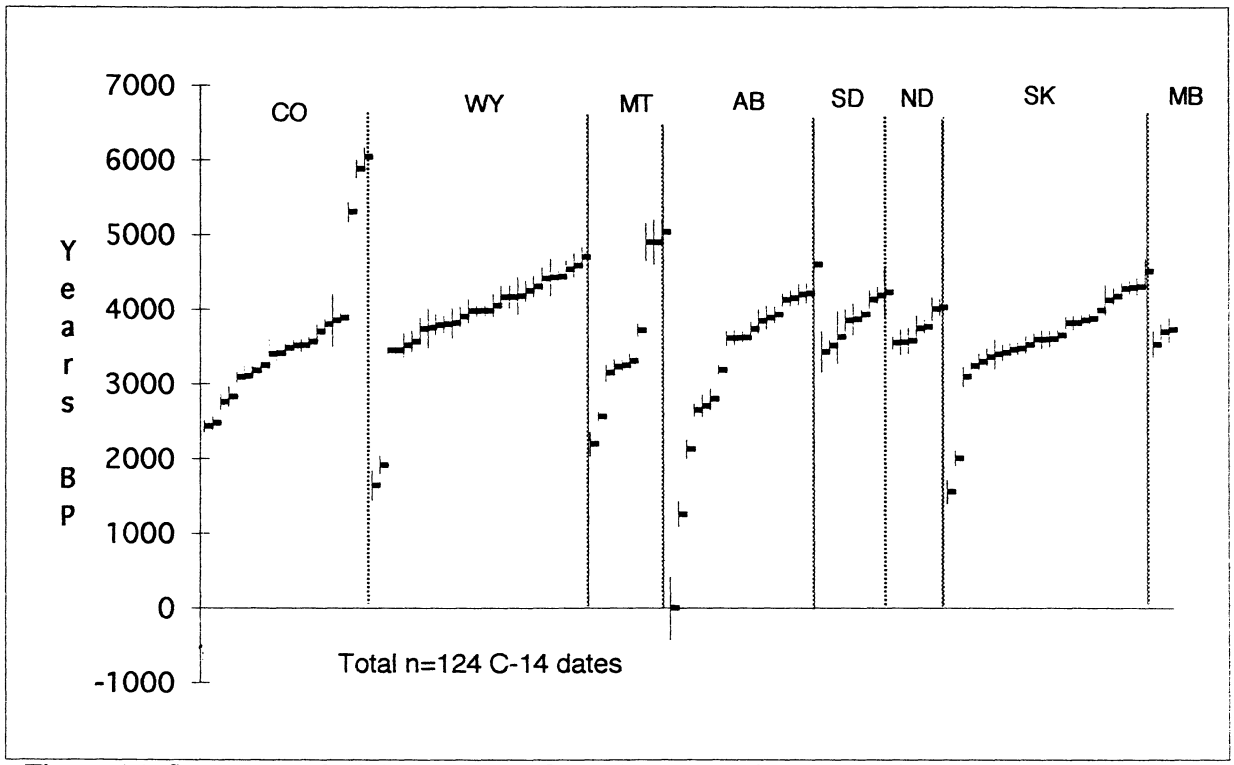


Figure 14: Summary of McKean phase C-14 dates to 1 sigma error by state or province.

Discussed in the first chapter of this thesis, are evidences that a period of drought affected the northern Plains beginning about 7500 years ago and subsiding about 5000 years ago (Antevs 1955; Barnosky 1989; Mulloy 1958; Sauchyn 1990; Vance et al. 1992). The effect of this drought on native populations within the region, however, is still debateable. Wedel (1961:254) envisioned a transformation of grasslands of the northern Plains to desert during the Altithermal. As a result, game populations dwindled which forced human populations, adapted as big game hunters to the previous environment of the Plains, to leave or forage. Although Mulloy (1954:443) earlier speculated on the former possibility, he also warned that the apparent absence of early Middle Prehistoric period sites could be due to problems in sampling strategies. Jennings (1957) suggested that instead of a cultural hiatus in the northern Plains during the Altithermal, foraging cultures similar to Desert Culture groups characterized human societies within the region at that time.

A general review of the literature suggests a paucity of early Middle Prehistoric period sites in some areas of the northern Plains. Walker (1980:140-141) observed that documented Mummy Cave complex sites are concentrated along the northern, eastern, and western peripheries of the Plains as well as the mountain isolates such as the Black Hills of South Dakota and the Cypress Hills of southeastern Alberta. Further, Walker (1980:155) remarked that, "The early Plains archaic [Mummy Cave complex] on the northern Plains appears to involve small-scale, single-component, open campsites located on alluvial terraces." Location of early Middle Prehistoric period sites was focused

on by Reeves (1973:1243) as a reason for the apparent lack of Mummy Cave complex sites on the Plains. Reeves suggested that, if peoples using a Mummy Cave complex technology were largely settling in the river valleys, the sites left behind would have been destroyed through erosion by the meandering waterways. Reeves (1973) also cautioned that the apparent cultural hiatus on the northern Plains, during the Altithermal, may result from sampling error, an inability of archaeologists to recognize diagnostic artifacts of the early Middle Prehistoric period in surface collections, or during the Altithermal, deposition so deeply buried some sites that they are not commonly exposed in shallow surface disturbances. All are reasonable suggestions especially when one observes that the Mummy Cave complex component identified at the Head-Smashed-In Buffalo Jump in southwestern Alberta is situated stratigraphically near the bottom of the cultural deposits and under more than 30 feet (11 meters) of colluvium (Brink et al. 1985; Brink and Dawe 1989; Reeves 1978).

Within the last decade, energy exploration and development has led to large scale inventory and excavation of cultural resources in response to historic preservation legislation. Such cultural resource investigations have facilitated archaeological studies across broad and varying environmental zones. However, even at stratified sites in the northwestern Plains where deep tests have been placed (Brumley 1975; Brumley and Rennie 1993a; Keyser and Wettstaed 1991; Munson pers. comm. 1993), components dating to the early portion of the Middle Prehistoric period have rarely been located. Another test of the potential cultural hiatus would be to examine private collections of

artifacts obtained from the northwestern Plains. Joyes and Jerde (1970) examined and reported on projectile points recovered from 60 sites in northeastern Montana. Projectile points identified as diagnostic of the Early Prehistoric period were represented at five (8.1%) of the sites. For the Middle Prehistoric period, Oxbow points were collected from 11 (18.3%) of the 60 sites, and McKean complex projectile points were collected from only seven (11%) of the sites. Interestingly, not a single Mummy Cave complex point was identified during the course of Joyes and Jerde's examination.

Stallcop and English (1969) summarized and published on 37 recorded archaeological sites in north central Montana. Five (24BL401, 24CH103, 24HL406, 24HL408 and 24HL410) were reported to contain McKean complex and later projectile point styles. Only a single site (24HL409), from the Bear's Paw Mountains proper, was reported to contain a possible Mummy Cave complex component (Stallcop and English 1969:41).

Within many areas of northern Montana, southern Alberta, and southern Saskatchewan ground surfaces appear to be stable in that they have been subjected to little or no depositional or erosional processes for extensive amounts of time. A testimonial to this statement is the fact that Joyes and Jerde (1970) reported numerous sites containing mixed cultural deposits (Early-Late Prehistoric period artifacts) on the surface and few or no subsurface cultural materials. If Mummy Cave complex peoples occupied grassland areas of the northwestern Plains which are some distance from a marginal zone, some diagnostic artifacts representing this period should be present. Further, the

occasional presence of Early Prehistoric period projectile points associated with Middle and/or Late Prehistoric materials suggests that erosional processes are insufficient to explain the paucity of Mummy Cave complex sites in the northwestern Plains.

It is likely that some artifacts recovered from the sites noted in the two previously mentioned studies actually date to the early part of the Middle Prehistoric period but were misidentified. As pointed out by Frison (1991:88), "...at culture layer 24 of Mummy Cave (Husted and Edgar n.d.), which dated at about 5400 years ago, a number of projectile points were found that out of context could easily fit [stylistically] into the Late Plains Archaic [Pelican Lake and Besant]." If the absence of Mummy Cave complex projectile points in surface finds from the prairie portions of the northern Plains is an accurate assessment, or a result of misidentification (e.g., misidentified as Besant), may never be fully known. The fact remains that the vast majority of stratified sites on the northwestern Plains do not contain Mummy Cave complex components.

Considering the apparent paucity of sites on the northern Plains dating to the Altithermal, the abrupt appearance of McKean complex sites across the northern Plains strongly suggests an expansion of groups of people(s). If so, a key question at this point is where did peoples using a McKean complex technology come from?

10.2 *Previous Considerations*

Accounting for the development of any archaeological complex is one of the long term goals of archaeological research, and the origins of the McKean

complex has been one of the most commonly debated topics in northern Plains cultural prehistory. After studying morphological similarities between the McKean complex artifacts recovered from the McKean site, and artifacts associated with the Humboldt and Pinto Basin complexes, Jennings (1957) postulated that the McKean complex developed from the Desert Culture and was spread throughout the northern Plains when the climate ameliorated. Similarities of projectile points among those three complexes, however, were questioned by Green (1975:159-169). Green suggested that manufacturing dissimilarities, and a temporal gap of at least 2000 years between the McKean complex and the Humboldt and Pinto Basin complexes provided sufficient evidence to dispute a Great Basin origin for the McKean complex. Since the time of Green's study, an increase in archaeological data from the Great Basin has provided evidence for a time span for Humboldt and Pinto Basin style projectile points beginning about 8500 years ago and terminating around 2500 years ago (Sturtevant 1986:117). The time span for the McKean complex now appears to be bracketed within the temporal parameters of the Humboldt and Pinto Basin complexes from the Great Basin.

Other postulations on the origins of the McKean complex include that of Reeves (1970) and Wormington and Forbis (1965), who suggested that the McKean complex may be derived from the Oxbow complex. This hypothesis was formulated after those researchers reviewed the data from the Mortlach site where Oxbow style points stratigraphically underlay McKean complex points. Alternatively, Syms (1969) suggested that the McKean complex and the Oxbow

complex might reflect temporally coeval adaptations. Dates compiled from Oxbow complex components at sites throughout the northwestern Plains since the early 1970's would support Syms' hypothesis (Brumley 1991; Brumley and Rennie 1993a; Melton 1988).

A third possible origin of the McKean complex is that it developed from late Paleoindian complexes found along the Rocky Mountain Front and in the Rocky Mountains. Since the time of Mulloy's work at the Keyhole Reservoir, a number of mid to high altitude sites have yielded projectile points that share many stylistic attributes with McKean complex materials. Such associations have led some researchers to propose that the McKean complex may have its origins in the central and northern Rocky Mountains and may actually represent a cultural continuation from terminal Paleoindian complexes (Benedict and Olson 1973; Frison 1991; Greiser and Plochman 1981; Husted and Edgar n.d.; Reeves 1979). Although projectile points of the McKean complex share a number of attributes with James Allen, Pryor Stemmed and Lovell Constricted points, a temporal gap of approximately 3000 years appears to separate the McKean complex from those terminal Paleoindian complexes (Frison 1991:27). Because many of the terminal Paleoindian complexes have been associated with sites in the Rocky Mountains where soils tend to be thin and acidic, and preservation of organic materials is uncommon. Fewer than 15 dates associated with terminal Paleoindian complexes have been thus obtained -- the majority of which are from rock shelters. Those dates do, however, cluster between 9000 and 8000 years ago (Frison 1991).

Increasingly, radiocarbon dates of 5000-8000 years B.P., and in association with projectile points stylistically similar to McKean complex points are being obtained from sites in the Rocky Mountain area (Baumler and Schwab 1992, Benedict and Olson 1973, 1978; Haines 1966). Van Dyke and Unfreed (1992) reported on excavation work at DjPm 36 in the Oldman River valley of southwestern Alberta where C-14 dates ranging from 6600 to 7800 years B.P. were obtained on a series of bison kill events. Of interest were the projectile points recovered from a controlled context within DjPm 36. The lanceolate and stemmed points resemble McKean complex points in many respects, but based on associated radiometric age, are best attributed to one of the terminal Paleoindian complexes. The dates and general morphological similarities of artifacts recovered from these sites may provide evidence for projectile point style continuity, and perhaps necessitate the need for a re-evaluation of the term "McKean complex". Until a more substantial link between terminal Paleoindian complexes and the McKean complex can be demonstrated, however, McKean can only be identified as a prehistoric cultural entity first recognized in the northern Plains approximately 4700 years ago.

10.3 *Trait Dichotomies within the McKean Complex*

Although projectile point styles provide the major focus of this thesis, the data in Chapters 3 through 8, and the literature review suggest a limited presence of distinctive features and artifacts in some McKean complex sites. Specifically, rock lined hearths, mano/metate systems, and Mallory points occasionally occur at McKean complex sites in southeastern Montana, western

South Dakota, western Nebraska, northern Colorado, and Wyoming. Such artifact and feature types are unrecorded at McKean complex sites in the Canadian Plains. It was primarily the presence of rock lined pit hearths and milling implements that led Mulloy (1954), and later Jennings (1957), to suggest that the McKean site resembled sites throughout the eastern Great Basin and probably represented usage by peoples stemming from the Desert Culture. Rock lined pit hearths and milling stones are generally associated with plant and seed processing and roasting activities in the Great Basin (Frison 1991; Jennings 1957; Mulloy 1954; Sturtevant 1986). The same analogy has been applied to interpret the function of rock lined pit hearths and milling implements within McKean complex sites on the northwestern Plains (Keyser 1986; Jennings 1957); however, associated macrofloral evidence to support this inference is limited. Interestingly, the temporal distribution of milling implements and rock lined pit hearths on the northwestern Plains appears to be more extensive than their spatial distribution. Using the data from the McKean sites previously discussed, and comparing these data to other cultural complex site data on a broader tempro-spatial scale, a tradition of distinct technological attributes seems to exist within certain archaeological manifestations in the northwestern Plains (Brumley and Rennie 1993a). A limited comparison of artifacts and features identified at 44 McKean, Pelican Lake and Avonlea sites throughout the northwestern Plains suggests that an east/west trending boundary can be placed at approximately the north slope of the Bull Mountains in central Montana. South of this imaginary boundary, rock lined hearths and

milling stones are common features of sites on the northwestern Plains dating from at least McKean to Avonlea times. Such artifacts and features are, however, absent or extremely rare at sites north of the Bull Mountains boundary. The sites from which that proposed trait dichotomy was constructed are summarized in Table 41.

As previously mentioned, rock lined pit hearths and milling stones are generally assumed to have been associated with plant and seed processing activities. The cultural implication of those features and artifacts is that the users may have been "Archaic" in nature -- relying heavily on plant foods and small game (Frison 1991; Jennings 1957; Keyser 1986; Mulloy 1954; Sturtevant 1986). The evidence for this assumption at McKean complex sites on the northwestern Plains, however, is extremely limited. This lack of evidence, in the form of associated charred plant remains, may be due in part to a lack of flotation studies conducted on fill matrices from within the features at many of the earlier investigated McKean sites.

Recent macrofloral analysis of hearth fills from archaeological sites on the northwestern Plains suggests that plant utilization may have actually become more popular during the Late Prehistoric rather than the two earlier periods (Aaberg 1993a-b). If that is the case, it may be that McKean peoples north of central Montana were no less dependent on plant resources than their counterparts to the south but simply used a somewhat different tool kit than southern McKean peoples. Further, it may be that lining pit hearths with stone does not reflect a specialized function, but may instead reflect cultural

Table 41: Distribution of select traits differentiating Northern and Southern Alsask tradition sites.

Site No.	Site Name	Trait: Edge Ground Cobbles	Trait: Grinding Stones	Trait: Rock lined Hearths	Cultural Complex Subdivision	Reference
McKean phase sites						
5BL120	Fourth of July Valley	-	-	-	S	Benedict and Olson 1973
--	Signal Butte	-	+	+	S	Strong 1935
48CK7	McKean	-	+	+	S	Mulloy 1954
48LN127	Cow Hollow Creek	-	+	+	S	Kullen et al. 1983
48PA201	Mummy Cave	+	+	-	S	Husted and Edgar nd
48PA551	Dead Indian Creek	-	+	+	S	Frison and Walker (eds) 1984
24ME1002	DesRosier	-	+	-	S	Brumley 1974
24PA504	Myers-Hindman	+	+	+	S	Lahren 1976
24RB1164	--	-	-	-	S	Munson 1990a
24RB1225	Dodge	-	-	-	S	Davis 1976
39HN204	Lightning Spring	-	+	-	S	Keyser and Davis 1984
32MZ58	Mondrian Tree	-	-	-	N	Toom and Gregg (eds) 1983
EcNl-1	Mortlach	-	-	-	N	Wettlaufer 1955
EbOp-16	Cactus Flower	-	-	-	N	Brumley 1975
FhNa-86	Crown	-	-	-	N	Quigg 1986
Pelican Lake phase sites						
--	Happy Hollow	-	-	+	S	Steege 1967
48PL23	--	-	+	-	S	Crane and Griffin 1961
39FA36-B	--	-	+	+	S	Wheeler 1958
48CK7	--	-	+	-	S	Mulloy 1954
48CK46	--	-	+	+	S	Wheeler 1958
48LN127	Cow Hollow Creek	-	+	+	S	Kullen et al. 1983
24GV117	Garfield Ranch	-	-	+	S	Munson 1990b
24PA504	Meyers-Hindman	+	+	+	S	Lahren 1976
24BW706	Pilgrim	-	-	-	I	Davis et al 1982
24CA74	Sun River	-	-	-	N	Greiser et al 1983
24CH669	Hoffer	?	-	-	N	Davis 1989 (ed.)
24PH2886	King	-	-	-	N	Brumley and Rennie 1993a
DgMr-1	Long Creek	-	-	-	N	Wettlaufer 1960
DjPl-11	--	-	-	-	N	Van Dyke et al 1989
DjPl-13	--	-	-	-	N	Van Dyke et al 1989
DjPm-44	--	-	-	-	N	Van Dyke et al 1989
DjPm-98	--	-	-	-	N	Van Dyke et al 1989
EbOp-16	Cactus Flower	-	-	-	N	Brumley 1975

Table 41: Continued.

Site No.	Site Name	Trait: Edge Ground Cobbles	Trait: Grinding Stones	Trait: Rock lined Hearths	Cultural Complex Subdivision	Reference
Avonlea phase sites						
48FR528	Woodward	-	+	-	S	Frison and Van Norman1988
48BH346	Beehive	-	+	+	S	Frison and Van Norman1988
24RB1164	--	-	+	+	S	Munson 1990b
24RB1145	--	-	+	+	S	Munson 1991
24BH609	Visborg	-	+	-	S	Frison and Van Norman1988
39HN204	Lightning Spring	-	-	+	S	Keyser and Davis 1984
24GV117	Garfield Ranch	-	+	+	S	Munson 1990a
24CH68	Lost Terrace	-	-	-	N	Greiser et al 1983
DhPi-31	Manyfingers	-	-	-	N	Quigg 1988
FhNa-61	Gravel Pit	-	?	-	N	Meyer 1985
DlOn-3	Larson	-	-	-	N	Milne 1988
EcOr-35	Ramillies	-	-	-	N	Brumley 1976
EaNg-1	Avonlea	-	-	-	N	Kehoe 1988
EeMw-26	Lebert	-	-	-	N	Smith and Walker 1988

Abbreviations

- = absent; + = present; ? = presence/absence indeterminate; -- = Insufficient information presented or no site name/number assigned

Cultural complex subdivision abbreviations: N northern; S southern; I indeterminate

Adapted with modification from Brumley and Rennie 1993a

preference/selection. Two sites in north central Montana (24CH2886 and 24BL595) contain well preserved, intact, cultural deposits with interesting implications for plant utilization strategies among northwestern Plains aboriginal groups (Brumley and Rennie 1993a-b). At the King site (24PH2886), an archaeological record spanning 4000 years and possibly five archaeological complexes was documented. Several hearth features were exposed in the Pelican Lake component and Late Prehistoric Mortlach composite components at the site. As these two components were the best represented within the areas of the site tested, they will be used for comparative purposes. Based on radiocarbon data supported by stratigraphic evidence, the Pelican Lake peoples occupied the King site over a period of approximately 1000 years (ca. 3100-2100 B.P.). Bison bone dominated the faunal assemblage, but deer, pronghorn, big horn sheep, medium and small size canids, freshwater clams, and birds were also represented. Collectively, the fill from two surface hearths associated with the Pelican Lake component produced only a single charred goosefoot seed (Aaberg 1993a).

The Mortlach composite was represented at 24PH2886 at two separate locales. Probably due to the de Vries effect (Taylor 1987) on organic materials produced within the past 300-400 years, precise temporal boundaries for the Mortlach component at the site could not be determined. Two dates of 110 ± 70 B.P. (Beta 60245) and 440 ± 80 B.P. (Beta 60251) were obtained from a bone and a charcoal sample collected from a controlled context within the Mortlach activity floors. The faunal assemblage was similar to that recovered from the

Pelican Lake component. Bison bone dominated, with pronghorn, big horn sheep, medium and small canids, freshwater clams, and birds also represented and believed to have been the product of human activity. The fill from four surface and shallow basin hearths were submitted for flotation studies (Aaberg 1993a). Results from three of the four samples contrasted markedly with the results from the fill samples analyzed from the Pelican Lake component:

> Collectively, the three Mortlach hearth fill samples contained the remains of sideoats gramma (n=52), slimleaf goosefoot (n=372), sunflower/aster (n=3), little barley (n=12), goosegrass (n=108), Rocky Mountain juniper (n=8), pea family (n=2), bluegrass (n=31), type 2 (n=3) and type 3 (n=2) knotweed, and wildrose (n=258) (Brumley and Rennie 1993a:245).

Although fairly large blocks were excavated at 24PH2886 within the areas containing the Pelican Lake and Mortlach materials (ca. 131 square meters within the Pelican Lake component and 58 square meters within the Mortlach component), it is possible that additional features which still exist within the Pelican Lake components at the site contain rich macrofloral records. It is also possible that use episodes of the site during Pelican Lake times were during times of the year that plants were dormant or in early growth. Fetal bison remains recovered from the Pelican Lake components at the site all indicate early winter to mid spring occupations (Brumley and Rennie 1993a:240). Evidence of seasonality for the Mortlach occupations is limited to a single fetal bison element, which suggests a fall event (Brumley and Rennie 1993a:244). During that time of year, plant resources would have been abundant. The assumption, of course, is that the prehistoric native occupants at the King site

utilized plant resources collected while they occupied the site. It is equally likely that plant materials utilized by prehistoric peoples at the King site were gathered prior to the times when the site was occupied.

Site 24BL595 in Blaine County, Montana is believed to be a camp/bison processing site probably associated with a nearby bison kill site (24BL596). Although only six square meters were excavated at the site during evaluation investigations, a surface hearth, a rock filled basin hearth, and a dense collection of lithic debitage and bone fragments were recovered. Fill from the two features were collected and submitted for flotation studies (Aaberg 1993b). Charcoal separated from the fill matrix of feature 1 produced a radiocarbon date of 890 ± 70 B.P. (Beta 63260). Although the soil sample from the surface hearth contained no charred plant remains, the rock filled hearth contained numerous goosefoot seeds (est. n=1134). Due to budgetary restraints, however, only 1/3 of the fill matrix could be processed. That sample produced remains of goosefoot (n=378), goosegrass (n=2), bluegrass (n=5), speargrass (n=6), hairgrass dropseed (n=4), and snowberry (n=3). Following analysis of the feature 1 sample, Aaberg (1993b:71) commented that, " The relatively strong plant macrofossil record of 24BL595 fits a pattern of plant use seen in both Wyoming and Montana. That pattern is a stronger macrofossil record from the Late Prehistoric Period than from the Early or Middle Prehistoric Period."

Seasonality of site occupation was estimated from the stage of development of recovered remains of a bison calf and a bison fetus. Assuming a May 15 birth date, the remains of the fully developed calf indicate a late spring to mid

summer kill, while the fetal remains indicate a late fall to mid winter kill. If feature 1 were constructed during the late spring to mid summer, many plant species would have been available as a food resource. Whether the generally rich macrofossil record of the Late Prehistoric period, when compared to the more limited macrofossil record of the Early and Middle Prehistoric periods, is real or skewed by factors of seasonality may be better understood with continued studies. The results, however, will not negate the fact that Late Prehistoric peoples often appear to have heavily exploited plant resources in areas where specialized artifacts associated with plant foodstuff preparation are not generally found.

Although records of substantial plant use are documented at 24PH2886 and 24BL595, no pit hearth was rock lined and no milling stones were identified within the artifact assemblages (Brumley and Rennie 1993a-b). If the occupants of these two sites had wanted to line their hearths with sandstone slabs or mill their collected plant remains, the opportunity did exist. At both sites 24BL595 and 24PH2886 outcroppings of sandstone, occurring in slabs of varying thickness, exist within a few meters of the sites. Local sandstone was used within numerous hearths throughout the various components of 24PH2886 and at 24BL595. In both instances small slabs of sandstone appear to have been used in stone boiling activities for they were either randomly placed into the excavated pits or, occasionally, strewn around the margins of a surface hearth. No patterned arrangement of stone within the hearths, however, was observed.

It may be tempting to suggest that a lack of milling stones and rock lined hearths north of the Bull Mountains is a consequence of a lack of sandstone outcroppings among the glacial tills to the north -- considering slabs of sandstone are the primary lithic material used in the construction of rock lined hearths. Sandstone outcroppings, however, are occasionally exposed throughout northern Montana, northwestern North Dakota, extreme south central Saskatchewan, and the isolated mountain ranges in north central Montana. To the best of my knowledge, however, rock lined hearths are absent from archaeological sites in these previously mentioned areas, and with a few rare exceptions so are grinding stones. Additional support of the proposed geographical distribution of rock lined hearths is the evidence for cobble lined hearths at the Dead Indian Creek site in Wyoming (Frison and Walker 1984:45). If the peoples of a single cultural identity were intent on creating prepared, rock lined hearths, then at the very least, we would see attempts to line these prehistoric hearths with whatever lithic materials were available. Hearths in prehistoric cultural sites on the northwestern Plains north of the Bull Mountains are typically amorphous surface hearths, although pit hearths, rock filled pit hearths, and stone roasting platforms occur with varying frequency. Rock lined hearths, however, have not been identified.

Further support of a dichotomy between Northern and Southern McKean complex sites is the occasional presence of Mallory style projectile points south of the Bull Mountains. As far as I am aware, no Mallory point has been associated with McKean complex points north of the Bull Mountains (Brumley

1975; Forbis n.d.; Lobdell 1973; Morris et al. 1985, Munson 1990a; Quigg 1986; Ramsay 1993).

The preceding discussion was intended to outline the hypothesis that, primarily, rock lined hearths and milling stones have a distinct geographical (North/South) distributions and, in the context of the northern Plains, are associated with what is designated the southern expression of the Alsask tradition (Figure 15). Defining characteristics of the Alsask tradition were originally presented by Brumley and Dau (1988) and later revised by Brumley and Rennie (1993a). The McKean complex is presently viewed as the initial stage of the Alsask tradition. McKean develops into Pelican Lake with Avonlea in turn developing from Pelican Lake.

In contrast, the Mummy Cave phase is presently seen as the initial stage of the Mondak tradition and may represent peoples affiliated with groups east of the northwestern Plains. Based on morphological attributes of projectile point types associated with the Mondak tradition (Reeves 1973:1245; Frison 1978:45), Oxbow appears to have developed out of Mummy Cave. Sandy Creek, proposed to have developed out of Oxbow, developed into Besant. Yonkee, temporally intermediate between Sandy Creek and Besant, is seen here as possibly a transitional stage or a short lived techno-complex, primarily within the Powder River Basin. The Wymont tradition is viewed as an influx of Late Prehistoric hunters, possibly coming from the Great Basin to the northwestern Plains. A complete discussion of the Alsask, Mondak, and Wymont traditions has been presented in Brumley and Rennie (1993a) and is

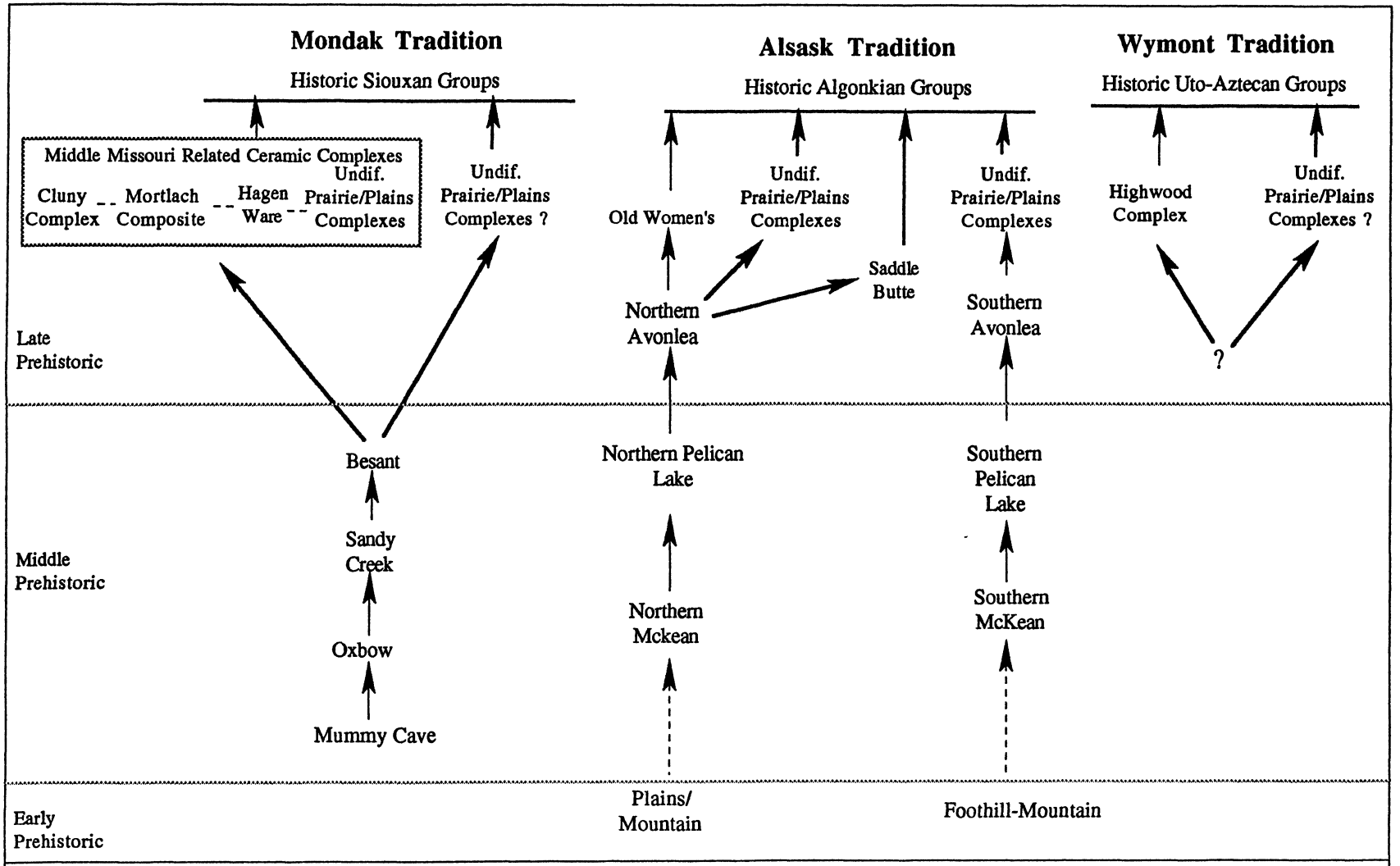


Figure 15: Schematic representation of proposed culture history model for the northern portion of the northwestern Plains (adapted from Brumley and Rennie 1993a).

outside the scope of this thesis. It should be noted that the culture history model represented by Figure 15 was developed primarily within the context of the northern portion of the northwestern Plains. Technologically, Middle Prehistoric period groups appear to have been relatively uniform throughout the northern Plains, but patterns which arise in Late Prehistoric sites in northern Montana and the plains of Alberta and Saskatchewan may not appear farther south.

At this point in the discussion I have presented evidence that Southern McKean complex peoples may not have been exploiting plant resources and diversified game animals to any greater extent than their northern counterparts. Peoples of the southern expression of the Alsask tradition do, however, appear to have a somewhat different tool kit than peoples of the northern expression. Considering the similarities in artifacts and features between Southern McKean phase sites and sites in the eastern Great Basin constituting the Wendover (9500 - 6000 B.P.) and Black Rock (6000 - 1500 B.P.) periods (Sturtevant 1986), technological and possibly, cultural ties seem to exist. I have attempted to demonstrate that factors other than environmental differences may be needed to explain the lack of rock lined pit hearths, milling stones, and mallory points in what has been identified here as the northern expression of the McKean phase. One interpretation of this trait dichotomy is that McKean peoples entered the northwestern Plains as two distinct, but related or affiliated groups, and in doing so may have displaced Mondak tradition groups as they expanded eastward onto the Plains (Brumley and Rennie 1993a). Peoples of the Southern McKean phase may have had closer ties with eastern Great Basin

peoples than northern McKean phase peoples. Conversely, northern McKean phase peoples appear to have had stronger ties with peoples in the northern portion of the Columbia Plateau than did peoples of the southern expression of the McKean phase. The proposed relationship between northern McKean complex sites and northern Plateau peoples is based on items of shell recovered at Cactus Flower (Brumley 1975) and the Crown site (Quigg 1986) which have definite west coast origins, as well as a recently proposed concave base, lanceolate projectile point tradition which arises within the northern montane areas as far north as the southern Yukon around 5000 years ago (Greer 1993). The proposed ancestral Paleoindian complexes near the beginning of the Altithermal have been termed the Foothill/Mountains complexes by Frison (1991). Farther north in the northwestern Plains, similar complexes have been termed Plains/Mountains complexes by Reeves (1979). A possible objection to the proposition that the McKean phase developed out of those terminal Paleoindian complexes is that several stratified sites containing Early and Middle Prehistoric materials, have large side-notched and even corner-notched projectile points stratigraphically separating terminal Paleoindian artifact assemblages from McKean complex materials (Alex 1991; Frison 1991; Husted and Edgar n.d.; Lahren 1976). A possible explanation for this stratigraphic separation is that the presence of Mummy Cave phase materials in marginal areas surrounding the Plains and within portions of the Plateau region may reflect a large scale displacement of the earlier terminal Paleoindian complexes by Mummy Cave peoples (Brumley and Rennie 1993a).

It was further hypothesized that following climatic amelioration at the end of the Altithermal, the lanceolate and stemmed tradition peoples who had largely occupied the Rocky Mountain and northern montane areas expanded back onto the northern Plains -- largely displacing the Oxbow phase (Mondak tradition) peoples. This proposed displacement may be especially evident in the central and western portions of the northwestern Plains (Brumley and Rennie 1993a). If that depiction of northwestern Plains and Rocky Mountain culture history is accurate, sites in or near the Rocky Mountains characterized by McKean complex like points with associated C-14 dates ranging from 7800 to 5000 years ago (Baumler and Schwab 1992; Van Dyke and Unfreed 1992) may support the idea of cultural territorial expansion and contraction. Other evidences which may suggest that Northern McKean phase peoples were largely affiliated with peoples of the Plateau area are outlined within the following section.

10.4 *Items of Import*

A general review of the literature indicates peoples using a McKean complex technology had strong ties to areas west of the northern Plains. *Olivella biplatica, Olivella baetieca,* and *Dentalium sp.* are marine shells from the west coast. Items made from shells of those three genera were recovered with McKean complex materials. Conversely, items made of shells from the east coast have not been recovered in association with McKean complex materials (Brumley 1975; Quigg 1986). The evidence also indicates the opposite pattern among Oxbow assemblages. *Olivella sp.* and *Natica clausa,*

which likely or definitely originated on the eastern and northeastern coasts of North America, were associated with the Oxbow materials at the Gray Burial site (Millar 1978). Supporting this proposed affiliation of Oxbow peoples with areas east of the northern Plains is the occasional presence of copper, which likely came from the Great Lakes region (Dyck 1983; Keisig 1993; Sparks 1992). In contrast, no copper items have been recovered from any McKean phase component.

Importing shell items largely, if not exclusively, from areas west of the northern Plains during the McKean phase does not appear to be carried on through the next proposed phase of the Alsask tradition -- the Pelican Lake phase. During Pelican Lake times, items of shell originating on both east and west coasts as well as the occasional presence of native copper (Brink and Baldwin 1988; Keisig 1993) may suggest increased interaction between peoples of the Alsask and Mondak traditions.

10.5 *Distribution of the McKean Phase*

At present, McKean phase sites have been identified from the Boreal Forest/Plains boundary of Alberta to southwestern Manitoba and as far south as northern Colorado (Benedict and Olson 1973; Frison 1991; Morris et al. 1985; Pollock 1981; Quigg 1986; Syms 1969). Eastern boundaries of the McKean phase are identified from the Boreal forest /Plains boundary in southwestern Manitoba and trend southward through the western portions of North Dakota, South Dakota, and Nebraska as far as the South Platte River drainage (Alex

1991; Keyser and Davis 1984; Strong 1935; Sundstrom 1989; Toom and Gregg 1983; Tratebas 1985).

Although the McKean phase is commonly thought of as an archaeological unit in the northern Plains, sites with McKean like projectile points occur within the Rocky Mountains portion of the Columbia Plateau (Choquette 1987; Reeves 1989; Roll 1982; Thoms 1987). While Reeves (1989) and Thoms (1987) consider these McKean style points as part of the McKean phase, Choquette (1987) and Roll (1982) appear to view McKean style points from the eastern Plateau as reflecting peoples who were distinct from peoples using McKean style points on the Plains. For Roll (1982), McKean style points in the eastern Plateau are placed within the Calyx phase, and for Choquette (1987) such points denote the Insimmi complex. Temporal placement of McKean looking projectile points from the Rocky Mountains and eastern Plateau areas, however, has been difficult. Organics rapidly decompose within the acidic soils of the mountains, and thin soils do not provide suitable stratigraphic control for multicomponent and/or multiple occupation sites. Unfortunately, little cultural resources investigative work has been conducted in the major river and tributary valley bottoms of the eastern Plateau where the potential for buried, intact sites is highest. Thus, searching for the relationships between the Plains and the intermontane areas has been largely unsuccessful. Presently, however, I can see no basis for differentiating Middle Prehistoric period assemblages containing lanceolate and stemmed points, within the eastern Plateau, from the McKean phase of the northern Plains.

11.0 SUMMARY AND DISCUSSION

The preceding discussion of artifact and feature types documented in various McKean phase components has not only shown their variability, but also demonstrates the difficulty researchers have in understanding the relationships among Duncan, Hanna, and McKean Lanceolate points. Although some cultural strata associated with the McKean phase were reported to contain only one of the three recognized varieties of contributing projectile point styles, if one critiques the projectile points from these sites using Mulloy (1954) and Wheeler's (1954) criteria, the evidence for those claims becomes extremely tenuous.

Quigg (1986) suggested that in the Crown site a series of strata are present which contain only projectile points classifiable as Hanna. The Hanna unit is suggested to be separate from, and stratigraphically overlies a series of strata which contain only McKean Lanceolate points. A review of Quigg's data, however, suggests distinct Hanna and McKean units do not exist at the site. Instead, McKean Lanceolate, Duncan, and Hanna points tend to occur together. Similarly, several points from Lightning Spring and 24RB1164 would be better classified as Hanna points instead of Duncan points -- following the descriptions of Mulloy (1954) and Wheeler (1954).

It has been suggested that the ratio of McKean Lanceolate points to Hanna points decreases over time, and near the end of the McKean phase there is an inverse relationship of Hanna points to McKean Lanceolate points (Brumley 1975:100-101). A time/frequency analysis of McKean phase projectile points

from select sites in the northwestern Plains supports this hypothesis (Tables 42-44; Figure 16). The data from northern and southern McKean phase sites are compared separately to test for possible differences in point style frequencies between Northern and Southern McKean sites. The data indicate that McKean Lanceolate points become less frequent in time and Hanna points more frequent in both the northern and southern expressions of the McKean phase. Between 4200 and 3900 B.P., it appears that McKean peoples began selecting the stemmed (Duncan and Hanna) point forms over the McKean Lanceolate form.

Another observation concerns the frequency distribution of Mallory points within Southern McKean assemblages. The distribution resembles that of the McKean Lanceolate style point-- a decrease in the ratio to stemmed points toward the end of the McKean phase. Admittedly, the data compared in this time/frequency distribution analysis are scant. Few McKean sites having largely intact, well stratified deposits with several diagnostic artifacts are available for comparison. More data are needed to test this apparent pattern in point/frequency distribution before a substantive claim can be made.

A comparison of the metric data for McKean Lanceolate, Duncan, and Hanna points from the sites analyzed in this thesis demonstrates overall similarities as well as possible dissimilarities (Table 45). McKean Lanceolate points average 31.6 mm in length, 16.7 mm in width, and 5.3 mm in thickness. Metric analysis of Duncan and Hanna points is more difficult, because most researchers disagree about what attributes define the Duncan and Hanna

Table 42: Frequency of McKean Lanceolate, Duncan, and Hanna points within select Northern McKean phase sites.

	Radiocarbon Years Before Present											
	(3300 - 3600)			(>3600 - 3900)			(>3900 - 4200)			(>4200)		
Site name	L	D	H	L	D	H	L	D	H	L	D	H
Mortlach		1	1									
Mondrian Tree					1							
Retail		1	3				3	1				
Crown			2	5	3	5	1					
Cactus Flower				1	4	7	3	7	2			
Total all	0	2	6	6	8	12	7	8	2	0	0	0
% of total	0	25	75	23	31	46	41	47	12	0	0	0

Table 43: Frequency of McKean Lanceolate, Duncan, Hanna, and Mallory points within select Southern McKean phase sites

	Radiocarbon Years Before Present															
	(3300 - 3600)				(>3600 - 3900)				(>3900 - 4200)				(>4200)			
Site name	L	D	H	M	L	D	H	M	L	D	H	M	L	D	H	M
Scoggin													20	1	5	22
Cordero Mine			3													
24RB1164		3	11	1												
Lightning Spring			1			1	3			3						
Total all		3	15	1		1	3						20	1	5	22
% of total	0	16	79	5	0	25	75	0	0	100	0	0	42	2	10	46

Table 44: Frequency of McKean Lanceolate, Duncan, and Hanna points within select Southern McKean phase sites.

	Radiocarbon Years Before Present											
	(3300 - 3600)			(>3600 - 3900)			(>3900 - 4200)			(>4200)		
Site name	L	D	H	L	D	H	L	D	H	L	D	H
Scoggin										20	1	5
Cordero Mine			3									
24RB1164		3	11									
Lightning Spring			1	0	1	3		3				
Total all	0	3	15	0	1	3			0	20	1	5
% of total	0	17	83	0	25	75	0	100	0	77	3	20

Abbreviatons: L = McKean Lanceolate; D = Duncan; H = Hanna; M = Mallory

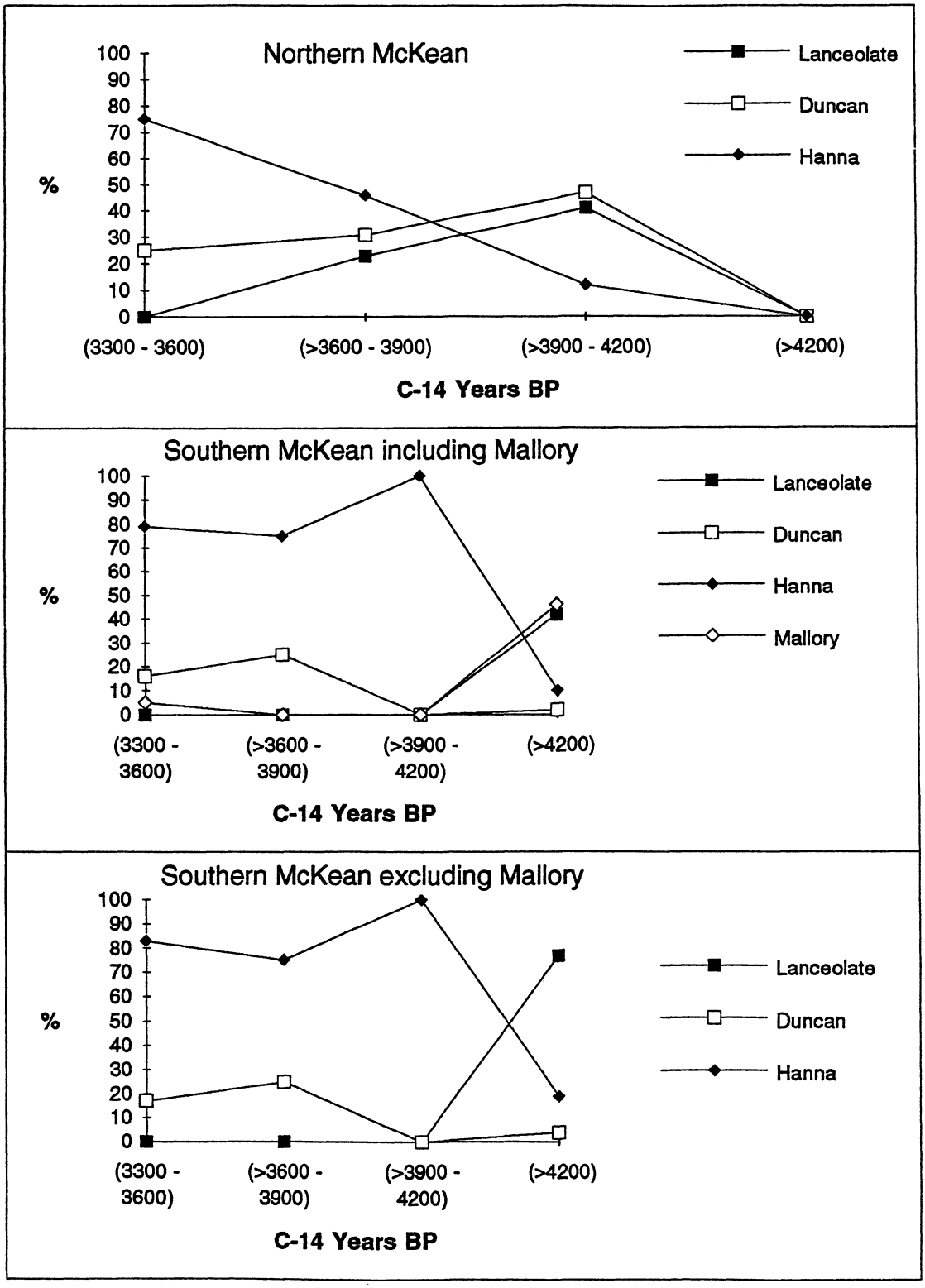


Figure 16: Graphic representation of Tables 42 to 44.

Table 45: Metric values of projectile points from the sites compared herein.

		Length					Width					Thickness				
		min	max	mean	sdev	N=	min	max	mean	sdev	N=	min	max	mean	sdev	N=
McKean Site		Insufficient data to present a metric analysis.														
Dead Indian Creek	M. Lanceolate	11.5	75	31 1	12	67	10	37	15.6	6.1	79	2.5	8	5.2	1.2	83
	Stemmed	20.2	44	30.4	6.4	39	12	20.8	15.8	2.4	53	3	10.5	5.3	1.3	53
	Notched	19.5	51.8	29.9	8.6	18	10	20.6	15.5	2.5	19	3	6	4.5	0.6	18
24RB1164	Stemmed	34	54	43.1	6.4	7	15	22	18.9	2.2	16	5	8	6.4	1.2	16
Lightning Spring		Insufficient data to present a metric analysis.														
Cactus Flower	M. Lanceolate	27	37.9	31 1	7 7	3	14	21.6	17.8	5.4	2	4.9	6.6	5.8	1.2	2
	Duncan	17	48.1	29.8	2.2	8	15	22.3	18.7	5.2	2	5.1	8.4	6.8	2.3	2
	Hanna	34.2	58.6	45.5	--	3	17.5	24.9	18.6	--	8	5.2	11 7	7.5	--	9
Crown Site	M. Lanceolate	30	30.4	32.7	2.3	3	14.4	19.1	16.7	2.4	3	4	6.2	5	1	4
	Duncan	21.2	43.9	33.9	11.6	3	20.6	21.2	21.7	1.9	3	5.9	9.6	8.3	1.6	4
	Hanna	25.1	37.7	31 1	5.2	6	17	25.5	20.2	2.5	7	4.1	10	6.9	1.9	8

All measurements given in millimeters

varieties. Therefore, with the exception of the projectile points recovered from the Cactus Flower and Crown sites, metric values of Duncan and Hanna points have been incorporated into the category of stemmed. The mean length of stemmed McKean phase points is 35.6 mm, whereas the mean width is 18.5 mm, and the mean thickness is 6.6 mm. The greater thickness of the stemmed points may be a result of having to lump Duncan and Hanna points together for this analysis. It has been suggested (Foor pers. comm. 1992) that some Hanna points were originally manufactured and used as hafted knives, and made into projectile points some time later. A greater width and thickness among re-manufactured points might be expected when compared to artifacts manufactured originally for the piercing end of a projectile. That consideration provides an alternative explanation for the greater widths and thicknesses of the stemmed points over the McKean Lanceolate points analyzed in this thesis. Of course, some degree of stylistic variation among projectile points is always expected. Point rejuvenation, reworking older, curated points, the quality and size of the lithic raw materials selected for use, and the level of knapping skills the producer(s) possessed must always be considered when discussing projectile point variability. The respective chi-square values of 0.15 and 0.21 for 1 degree of freedom do not, however, support any suggestion that there is a significant difference in the widths and thicknesses between McKean Lanceolate points and the stemmed (Duncan and Hanna) varieties.

Foor (1985) observed that morphologically similar projectile point styles were used at roughly the same time in numerous geographical regions. This

fact has to be considered when discussing an archaeologically defined culture based upon projectile point style. A review of the literature regarding projectile point typologies and the temporal placement of these projectile point styles has corroborated Foor's statement. McKean phase style projectile points occur throughout the northern and central Plains, along the western and eastern slopes of the Rocky Mountains, and throughout the Great Basin within what is known as the Humboldt and Pinto Basin complexes (8500 B.P. - 2500 B.P.). McKean phase style points from the west slope of the Rocky Mountains have been placed in the Calyx phase (Roll 1982) and the Insimmi complex (Choquette 1987), but problems with stratigraphy and organic preservation at sites in the Rocky Mountains precludes placing these proposed complexes on the time scale with confidence, and the general similarities among these artifacts with McKean materials presently provides little support for separating these assemblages.

A comparison of nonprojectile point artifacts recovered from the McKean sites discussed in this thesis demonstrates several interesting patterns. Hafted bifaces with wide side-notches that were likely not intended for use as projectile points, are common throughout the McKean phase (Brumley 1975; Davis 1976; Quigg 1986; Ramsay 1993), but they are also common within Mummy Cave and Oxbow phase sites (Greiser et al. 1983; Heffington 1985, Millar 1978). Brumley (pers. comm. 1993) suggested that hafted spokeshaves may be diagnostic of at least the northern McKean and, possibly, Pelican Lake phases, and Keyser and Davis (1984:23), and Munson (1990a:123) have suggested that thin, flat

informal endscrapers manufactured on a flake preform may be diagnostic of the McKean phase within the Pine Parklands of southeastern Montana and northwestern South Dakota if not elsewhere.

With the appearance of the McKean phase on the northwestern Plains, the earliest evidence for the use of the tipi or skin covered domicile has been documented in several cases. As previously mentioned, a segment of a probable stone circle was exposed during excavations at the Cactus Flower site (Brumley 1975, pers. comm. 1993). Additionally, stone circles have been associated probably or positively with McKean phase points at three other sites in Alberta and Saskatchewan (Stuart 1990; Keisig 1993; Finnigan 1982).

Evidence for mortuary practices among Northern McKean phase peoples is more limited than among Southern McKean phase peoples; however, general similarities do seem to exist. Differences are also apparent when comparing McKean phase mortuary practices with the coeval Oxbow phase and the succeeding Pelican Lake phase. Two main characteristics are noted within the documented McKean phase burials. The first is a tendency for interring the remains of the deceased within the activity floor of the group's campsite. The second is a paucity of associated grave goods. Pelican Lake phase burials demonstrate a tendency to inter their dead secondarily beneath a cairn, and away from a campsite. Additionally, Pelican Lake burials may demonstrate that more attention was paid to the remains of their deceased than McKean phase peoples paid to their deceased.

Oxbow mortuary practices include flexed, bundled, extended, primary, and secondary burials of both juveniles and adults. Similar to the traits identified in Pelican Lake burials, Oxbow mortuary practices appear to demonstrate more care for the deceased. A liberal use of red iron oxide (red ocher) and numerous grave goods are common. What has been demonstrated among at least one group of Oxbow peoples on the northern Plains is the reuse of a burial site (the Gray Burial site) for perhaps two millennia (Millar 1981). Presently, an ossuary site such as the Gray Burial has not been associated with any other northern Plains prehistoric cultural group.

Considering evidences reported on previously by Brumley and Rennie 1993a:26, which suggest that Pelican Lake developed out of the McKean phase, the observable similarities between mortuary practices of Pelican Lake and Oxbow peoples may reflect similarities in adaptive strategies and/or socio-religious affinities resulting from increased interaction between Alsask and Mondak tradition groups. In other words, it is possible that the increase in grave goods is related to a social organization and a socio-religious belief system which allowed for, or required more time to be spent preparing an individuals remains for the afterlife.

Heating/cooking facilities, and the grinding stone data from the McKean phase sites analyzed in this thesis confirm a previously documented trait dichotomy (Brumley 1975; Brumley and Rennie 1993a; Frison 1978, 1991; Keyser 1986). Milling stones (manos and metates), and rock lined hearths occur in sites within southeastern Montana northwestern South Dakota, and

northern Wyoming but are lacking at the two sites in Alberta and Saskatchewan. The function of the rock lined hearth design is debateable. Most researchers view rock lined hearths as artifacts for roasting vegetal and/or animal foodstuffs (Keyser 1986; Mulloy 1954; Sturtevant 1986:177), but Frison (1991:89) suggests they could have heated the inside of small shelters during cold weather. Presumably, the stones lining the walls of the pit would have heated and radiated warmth. This would favor smaller, more manageable fires, and a overall conservation of fuel during the coldest weather. Based on available radiocarbon evidence from sites containing rock lined hearths on the northwestern Plains, these features appear latest by the Middle Prehistoric period and persist through Late Prehistoric times, but they may have been used with less frequency during the Late period (Fredlund et al. 1983; Frison 1978, 1991). A limited artifact and feature comparison from a sampling of sites associated with the McKean, Pelican Lake, or Avonlea phases suggests that rock lined hearths associated with milling slabs first appear during McKean times and extend through Avonlea times. The sites that contain rock lined hearth features and milling implements are distributed exclusively south of central Montana. Conversely, components of the Mondak tradition appear to lack rock lined hearths and possibly milling implements. Possible exceptions to this generalization appear within the artifacts recovered from cultural layer 30 of Mummy Cave (48PK201) in northwestern Wyoming, and within the Cow Hollow Creek site (48LN127) in southwestern Wyoming. Husted and Edgar (n.d.) report on the recovery of three grinding stones associated with McKean and

Oxbow phase points. As the range in variation among the points recovered from cultural layer 30 is greater than among the points recovered from unequivocal McKean phase components, the materials may be intermixed in cultural layer 30.

At the Cow Hollow Creek site, a cultural sequence extending from terminal Paleoindian to the Late Prehistoric period was identified (Kullen et al. 1983). Numerous grinding stones and rock filled and rock lined hearths were recovered; however, it was not made clear from which components the rock lined hearths and milling stones were recovered. The writers note that, " Paleo-Indian and Early Archaic Period components are culturally similar to the Northwestern Plains cultures. Middle Archaic Period components reflect influences of both Great Basin and Northwestern Plains cultures, and Late Archaic through Late Prehistoric Period Cow Hollow Creek Site components are a mixture of Northwestern Plains and Great Basin cultures (Kullen et al. 1983:27)."

It has been suggested that the McKean phase accompanied an influx of eastern Great Basin peoples moving onto the unoccupied northern Plains 5000 years ago (Husted and Edgar n.d.; Jennings 1957; Mulloy 1954). This diffusion is predicated on similarities in artifact and feature types such as projectile points, rock lined hearths and milling slabs. Further support is provided by the presence of slab lined hearths and milling stones throughout the eastern Great Basin before 5000 B.P. An example would be the rock lined hearths and pits exposed during excavations at Sudden Shelter in central Utah that date from

5777 ± 90 B.P. to 5420 ± 140 B.P (Sturtevant 1986:152). Such dates clearly precede the appearance of the McKean phase on the northern Plains. Based on that evidence alone, it would be logical to assume that McKean complex groups had ties with groups in the eastern Great Basin. As previously discussed, however, milling stones and rock lined hearths occur within southern McKean sites but are absent in northern McKean sites. It seems reasonable that, if McKean peoples migrated from the Great Basin and expanded across the northern Plains, at least some attempts to line pit hearths with stone and use milling implements should be discovered in a few of the McKean sites north of central Montana. If, however, the populating of the northern portions of the northwestern Plains by McKean peoples was slightly later than farther south, traits such as milling implements and rock lined hearths might have been abandoned during the northward expansion for lack of suitable resources.

There are several possible problems with this premise. First, although topographically the prairies of the northwestern Plains differ from the Parklands and basin areas of the central and southern portions of the northwestern Plains, the biotic communities which native populations utilized for subsistence are similar for the two areas in most respects. Second, paleoethnobotanical evidences recovered from sites 24BL595 and 24PH2886 suggest a substantial use of plant foods by the Late Prehistoric inhabitants of these two sites (Aaberg 1993a-b; Brumley and Rennie 1993a-b). Further, a pattern of increased reliance on plant foodstuffs during the Late Prehistoric period has been documented by Aaberg (1993a-b) for sites in both Montana and Wyoming.

Another problem with invariably associating artifacts, such as milling stones or rock lined hearths, with plant and seed processing is that these artifact and feature types were not recovered/identified during excavations at 24BL595 or 24PH2886. If prehistoric peoples at these sites wanted to line their hearths with thin, flat slabs of sandstone or mill their collected plant materials, the opportunity presented itself at both sites (Brumley and Rennie 1993 a-b).

A third potential problem with suggesting a northward expansion onto the Plains by McKean peoples is that a handful of sites within or near the Rocky Mountain Front on the central and northern portions of the northwestern Plains contain McKean phase style points, but date from approximately 5500 to 7800 years ago. These sites may provide evidence for continuity of lanceolate and stemmed projectile points in and along the Rocky Mountains, which also condenses the temporal gap believed to exist between terminal Paleoindian complexes and the McKean phase.

Several examples have been presented in this thesis that suggest McKean phase peoples may have had social ties with groups west of the northern Plains. These examples illustrate the presence of west coast marine shells to the virtual exclusion of east coast marine shells. As proposed by Brumley and Rennie (1993a), this apparent trait is based on evidence recovered from the Cactus Flower site (Brumley 1975), the Crown site (Quigg 1986), the Gray Burial site (Millar 1978), and the Highwood River burial (Brink and Baldwin 1988). In comparing these sites, specimens of *Olivella* and *Dentalia* , endemic to the northwest coast, occur within these McKean and Pelican Lake sites, and

only specimens of *Natica sp.*, endemic to the east coast, were recovered during excavations at the Gray burial site.

The available archaeological evidence supports the concept of two major prehistoric cultural traditions in the northern Plains during the Middle Prehistoric period. Because this thesis focussed on the McKean phase, attributes that distinguish the Alsask and Mondak traditions, and all phases suggested to be contained within these two traditions, were not fully discussed. A complete discussion of the characteristics that define these traditions is presented in Brumley and Rennie (1993a). The attributes that distinguish McKean from Oxbow and Pelican Lake, and suggest a dichotomy within the McKean phase, were outlined in this thesis. The trait dichotomy was discussed in the preceding chapter, and is referred to as the northern and southern expressions of the McKean phase. Figure 15 illustrates the temporal location of McKean in reference to other archaeological phases in the northern Plains. It is hoped, of course, that the culture history model illustrated in Figure 15 will motivate archaeologists to test the ideas underlying the model and provide feedback concerning its weaknesses.

This study of the McKean phase has outlined a number of research topics that need to be addressed by future studies of McKean sites. Although the McKean phase was one of the earliest recognized, and has been one of the most researched archaeological units in the northwestern Plains, it remains among the poorest understood. At present, a minimum of 124 radiocarbon dates characterize McKean phase components at 54 sites. Less than ten of

those sites, however, have intact stratified deposits containing a sufficient number of diagnostic artifacts and datable organics to allow for a better understanding of the McKean phase. From a perspective of cultural resource management, sites containing McKean phase components should be evaluated on their capacity to provide the following information:

1) How dependent, in relation to preceding and succeeding cultural complexes, were McKean phase peoples upon plant resources?

2) Is there a quantitative difference in plant usage between the northern and southern expressions of the McKean phase?

3) What types of features does the site potentially contain, and can anything be said about the spatial patterning of the features?

4) Which McKean phase point styles (preferably based on Mulloy's (1954) and Wheeler's (1952, 1954) descriptions) are present?

5) Does one point form (McKean Lanceolate, Duncan or Hanna) appear to dominate?

6) What can be said about hunting strategies of McKean phase peoples? Although bison bone generally dominates the faunal remains in McKean phase components, little is known about McKean hunting techniques.

7) What evidence does the site provide for placing the McKean phase in an archaeologically defined developmental sequence?

In conclusion, McKean is defined here as an archaeological phase that appears in the northern Plains by approximately 4700 years ago and is most commonly identified by the presence of McKean Lanceolate, Duncan, and Hanna projectile points likely used as dart points with the atlatl system. The McKean phase is unique among archaeologically defined cultures of the northern Plains in that it embraces three point styles (McKean Lanceolate,

Duncan, and Hanna) in its northern expression, and four (Mallory) in its southern. Although the evidence is limited, there is some indication that the ratio of McKean Lanceolate points to either Duncan or Hanna points at the beginning of the phase is higher, and the ratio of Hanna points to either Duncan or McKean Lanceolate is higher toward the end of the phase. Anyhow, the evidence suggests that McKean Lanceolate, Duncan, and Hanna points can be expected to occur together in all McKean sites.

The origin of McKean phase peoples is unclear, but it is suggested here that the diffusion of the McKean phase in the northern Plains was an eastward movement from largely the northern and central Rocky Mountains area. A trait dichotomy within the McKean phase is perhaps evidenced as a response to the differential availability of resources in the northern and southern portions of the northern Plains. Alternatively, the traits characterizing the dichotomy may reflect culturally selected attributes that provided little or no functional advantage. At present, however, it appears that McKean phase peoples in the northern Plains depended heavily on bison, but did not employ the communal hunting techniques that gain prominence in succeeding cultural phases.

REFERENCES CITED

Aaberg, Stephen

1993a The Plant Macrofossil Record from 24PH2886. In The Results of Investigations at the King Site along the East Margins of the Little Rocky Mountains. John Brumley and Patrick Rennie (Authors). Consultants report prepared for the Fort Belknap College, by Ethos Consultants Inc., Havre, Montana.

1993b 24BL595 Paleoethnobotanical Analysis Results. In Evaluation Investigations of Site 24BL595: Fort Belknap Wetland Project: Final Report. John Brumley and Patrick Rennie (Authors). Consultants report prepared for the Montana Department f Transportation, by Ethos Consultants Inc., Havre, Montana.

Albanese, John

1985 Geology of the McKean Site (48CK7). In McKean/Middle Plains Archaic: Current Research. M. Kornfeld and L. Todd, eds. Pp. 105-108. *Occasional Papers on Wyoming Archaeology No. 4.*

Alex, Lynn

1991 The Archaeology of Beaver Creek Shelter (39CU779): A Preliminary Statement. *Rocky Mountain Region National Park Service No.3.*

Antevs, Ernest

1955 Geologic-Climatic Dating in the West. *American Antiquity* 20 (4): 317-335.

Barnosky, Cathy

1989 Postglacial Vegetation and Climate in the Northwestern Great Plains of Montana. *Quaternary Research* 31: 57-73.

Baumler, Mark and David Schwab

1992 Personal communication regarding site 24MA1144.

Beaudoin, Alwynne

1987 Collection and Submission of Samples for Radiocarbon Dating. In Archaeology in Alberta 1986. *Archaeological Survey of Alberta, Occasional Paper No. 31.*

Bender, M., D. Baerris, R. Bryson and R. Steventon

1981 University of Wisconsin Radiocarbon Dates XVIII. *Radiocarbon* 23(1): 145-161.

Benedict, James
1979 Getting Away From it All: A Study of Man, Mountains And the Two Draught Altithermal. *Southwestern Lore* 45(3):1-12.

Benedict, James and Byron Olson
1973 Origin of the McKean Complex: Evidence from Timberline. *Plains Anthropologist* 18(62):323-327.

1978 The Mount Albion Complex: A Study of Prehistoric Man and the Altithermal. *Center for Mountain Archaeology Report No. 1.*

Bentzen, Raymond
1962 The Powers-Yonkee Bison Trap. *Plains Anthropologist* 7(16):113-118.

Brandau, B. and J. Noakes
1978 University of Georgia Radiocarbon Dates VI. *Radiocarbon* 20(3) 487-501.

Brink, Jack, Milt Wright, Bob Dawe and Doug Glaum
1985 Final Report of the 1983 Season at Head-Smashed-In Buffalo Jump Alberta. *Archaeological Survey of Alberta, Manuscript Series, No.1.* Edmonton.

Brink, Jack and Bob Dawe
1989 Final Report of the 1985 and 1986 Field Season at Head-Smashed-In Buffalo Jump Alberta. *Archaeological Survey of Alberta, Manuscript Series, No.16.* Edmonton.

Brink, Jack and Stuart Baldwin
1988 The Highwood River Site: A Pelican Lake Phase burial from the Alberta Plains. In the *Canadian Journal of Archaeology* Vol.12, pp. 109 136.

Brown, Lauren
1947 *Grasslands: The Audubon Society Grasslands.* 1985 Edition. Alfred A, Knopf Inc. New York.

Brumley, John
1974 Report on Test Excavation at the DesRosier Site (24ME1002). *Archaeology in Montana* 15(3):1-21.

Brumley, John (continued)

1975 The Cactus Flower Site in Southeastern Alberta: 1972-1974 Excavations. *National Museum of Man, Mercury Series, Archaeological Survey of Canada Paper No. 46.*

1976 Ramillies: A Late Prehistoric Bison Kill and Campsite Located in Southeastern Alberta, Canada. *National Museum of Man, Mercury Series, Archaeological Survey of Canada Paper No. 55.*

1981 Definitions and procedures employed in the excavation, description and analysis of archaeological materials (revised edition). Unpublished manuscript on file at Ethos Consultants Inc.

1991 Unpublished data from the Bearspaw Mountains of northcentral Montana.

1992 Regional datasets for the study of northern Plains archaeology. Series of MacIntosh Computer data files and documentation. Consultants report (Ethos Consultants Ltd.) for Alberta Public Works Supply and Service, Edmonton. Copy on file, Archaeological Survey of Alberta, Edmonton. Submitted in partial fulfillment of the management programme requirements, Oldman River dam archaeological report.

n.d. Management report for the Old Man River Dam Archaeological Project. Manuscript in preparation.

Brumley, John and Barry Dau

1988 Historical Resource Investigations Within the Forty Mile Coulee Reservoir. *Archaeological Survey of Alberta. No.13*, Edmonton, Alberta.

Brumley, John and Patrick Rennie

1993a The Results of Investigations at the King Site along the East Margins of the Little Rocky Mountains. Consultants report prepared for the Fort Belknap College, by Ethos Consultants Inc., Havre, Montana.

1993b Evaluation Investigations of Site 24BL595: Fort Belknap Wetland Development Project - Final Report. Consultants report, Ethos Consultants Inc., Havre, prepared for the Montana Department of Transportation, Helena.

Buchner, A.

1979 *The 1978 Caribou Lake Project.* Papers in Manitoba Archaeology, Final Report No. 8. Historic Resources Branch, Department of Cultural Affairs and Historical Resources, Winnipeg.

Buckley, J.
1976 Isotopes' Radiocarbon Measurements XI. *Radiocarbon* 18(2):172-189.

Chapman, Robert, Ian Kinnes and Klavs Randsborg (eds)
1981 *The Archaeology of Death.* Cambridge University Press, Cambridge.

Choquette, Wayne
1987 Cultural Resource Inventory: Herman Duncan Special Use Permit 87-KO-3-7. Manuscript on file with Kootenai National Forest Office, Libby.

Clarke, David
1978 *Analytical Archaeology.* Columbia University Press. New York.

Crane, H. and J. Griffin
1961 University of Michigan Radiocarbon Dates VI. *Radiocarbon* 3:105-125.

1962 University of Michigan Radiocarbon Dates VII. *Radiocarbon* 4:183-203.

Cunningham, Catherine (ed)
1982 *Montana Weather.* Published by Montana Magazine, Helena, Montana.

Davis, Leslie
1972 The Prehistoric Use of Obsidian in the Northwest Plains. Unpublished Ph.D. dissertation. University of Calgary.

1976 The Dodge Site (24RB1225): A McKean Phase Lithic "Cache" in the Tongue River Valley. *Archaeology in Montana* 17(1-2) pp.35-51.

1982a Stone Circles in the Montana Rockies Systematic Recovery and Culture-Ecological Inference. Report prepared for the Montana Army National Guard by the Montana State University Office of Research and Development, Bozeman, Montana. Manuscript on file at the Montana State Historic Preservation Office.

1982b Floodplain Archaeology at the Holmes Terrace Site (24FR52), Fergus County, Montana. Report prepared for the Bureau of Land Management by the Montana State University Office of Research and Development Bozeman, Montana. Manuscript on file at the Montana State Historic Preservation Office.

Davis, Leslie (continued)
1982c Montana Archaeology and Radiocarbon Chronology 1962-1981. *Archaeology in Montana Special Issue* 3.

Davis, Leslie (ed)
1989 Cultural Succession at the Hoffer Site (24CH669) and Eagle Creek Confluence, Upper Missouri National Wild and Scenic River, North Central Montana, High Plains. *Archaeology in Montana* 30(1-2).

Duke, Philip
1991 *Points in Time.* University Press of Colorado. Niwot.

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

Finnigan, James
1982 Tipi Rings and Plains Prehistory: A Reassessment of their Archaeological Potential. *National Museum of Man, Mercury Series, Archaeological Survey of Canada Paper No. 108.*

Foor, Thomas
1985 Archaeological Classification in the Northwestern Plains Region. *Plains Anthropologist* 30-108:123-135.

Forbis, Richard
n.d. Signal Butte and MacHaffie: two stratified sites on the northern Great Plains. Unpublished manuscript on file, Department of Archaeology, the University of Calgary.

Fredlund, Lynn, Dale Herbort and Gene Munson
1983 Archaeological Investigations at the North Antelope Mine, Eastern Powder River Basin, Wyoming: Report of Phase II Mitigation Results. Consultants report prepared for the North Antelope Coal Company, Denver, by Mineral Research Center, Butte, Montana.

Frison, George
1962 Wedding of the Waters Cave, 48SH0301, A Stratified Site in the Big Horn Basin of Northern Wyoming. *Plains Anthropologist,* 7(18): 246-265.

1965 Spring Creek Cave, Wyoming. *American Antiquity* 31(1):81-94.

Frison, George (Continued)
1970 Review of "Bighorn Canyon Archaeology" by Wilfred Husted. *American Anthropologist* 72(3):693-694.

1978 *Prehistoric Hunters of the High Plains.* First edition, New York, Academic Press.

1988 Avonlea and Contemporaries in Wyoming. In *Avonlea Yesterday and Today: Archaeology and Prehistory.* Leslie B. Davis, editor.

1991 *Prehistoric Hunters of the High Plains.* Second edition, New York, Academic Press.

Frison, George and Zola Van Norman
1985 The Wind River Canyon Burial and Cache: 48HO10. *Archaeology in Montana.* 26(2): 43-52.

Frison, George and Danny Walker (eds)
1984 The Dead Indian Creek Site: An Archaic Occupation in the Absaroka Mountains of Northeastern Wyoming. *Wyoming Archaeologist* 27(1-2).

Frison, George and Michael Wilson
1975 *An Introduction to Bighorn Basin Archaeology.* Wyoming Geological Association, Twenty-seventh Annual Field Conference Guidebook.

1988 Avonlea and Contemporaries in Wyoming. In *Avonlea Yesterday and Today: Archaeology and Prehistory.* Leslie B. Davis, editor.

Gill, George
1984 The Partial Skeleton of a Child from Dead Indian Creek. *The Wyoming Archaeologist* 27(1-2), Pp. 97.

Green, James
1975 McKean and Little Lake Technology: A Problem in Projectile point Typology in the Great Basin of North America. In *Lithic Technology: Making and Using Stone Tools,* edited by Earl H. Swanson. Mouton, The Hague, The Netherlands.

Greer, Sheila
1993 Anne Lake: A Southern Yukon Mid-Holocene Cultural Complex. *Canadian Journal of Archaeology,* Vol. 17:26-42.

Greiser, Sally
1988 Lost Terrace Avonlea Material Culture. In *Avonlea Yesterday and Today: Archaeology and Prehistory*. Leslie B. Davis, ed.

Greiser, Sally and Heidi Plochman
1981 Archaeological Investigations at the West Rosebud Archaeological Site 24ST651. *USDA Forest Service, Northern Region, Cultural Resource Report* No.2. Manuscript on file at the Montana State Historic Preservation Office.

Greiser, Sally, T. Weber Greiser, Susan Vetter and Alan Stanfill
1983 Sun River (24CA74): A Stratified Pelican Lake and Oxbow Occupation Site Near Great Falls, Montana. Report submitted to the Omaha District, U.S. Army Corps of Engineers, by Historical Research Associates, Missoula, Montana. Manuscript on file at the Montana State Historic Preservation Office.

Haines, Aubrey
1966 The Rigler Bluffs Hearth Site: 24PA401. *Archaeology in Montana* Vol 7(2):5.

Haspel, Howard and Dale Wedel
1985 A Middle Plains Archaic Child Burial from the McKean Site in Northeastern Wyoming. In McKean/Middle Plains Archaic: Current Research. M. Kornfeld and L. Todd, eds. Pp. 105-108. *Occasional Papers on Wyoming Archaeology No. 4.*

Heffington, Douglas
1985 The Altithermal Sidenotched Knife: A Northwest Plains and Eastern Great Basin Horizon Style. *Journal of Intermountain Archaeology* Vol 4.

Heizer, Robert and Thomas Hester
1978 Great Basin Projectile Points: Form and Chronology. *Ballena Press Publications in Archaeology, Ethnology, and History* No. 10.

Hillman, Ross
1984 Fire Hearth and Pit Features. In Artifact and Feature Descriptions. *The Wyoming Archaeologist*, 27(1-2):41-45.

Hurt, Wessley
1960 A New Radiocarbon Date from South Dakota. *W.H. Over Museum News* 21 (11-12):1-3.

Husted, Wilfred
1969 Bighorn Canyon Archaeology. *Smithsonian Institution River Basin Surveys, Publications in Salvage Archaeology* No. 12.

Husted, Wilfred and Robert Edgar
n.d. The Archeology of Mummy Cave Wyoming: An Introduction to Shoshonean Prehistory. Manuscript on File at the Montana State Historic Preservation Office.

Jennings, Jessie
1957 Danger Cave. Anthropological Papers 27. Salt Lake City: University of Utah Press.

Joyes, Dennis
1967 The Avery Site: A Preliminary Statement. *Manitoba Archaeological Newsletter* 4(1):3-5.

Joyes, Dennis and Tom Jerde
1970 Northeastern Montana Archaeology. *Archaeology in Montana* 11(4): 1-14.

Kehoe, Thomas
1965 Buffalo Stones: An Addendum to "The Folklore of Fossils." *American Antiquity*, 39(155):212-213.

1988 1984 Excavations at the Avonlea Type Site. In *Avonlea Yesterday and Today: Archaeology and Prehistory*. Leslie B. Davis, editor.

Keisig, Melanie
1993 Data concerning excavated sites and items of copper and shell recovered in association with Oxbow, McKean and Pelican Lake sites in Saskatchewan. Data sent to the author by Melanie Keisig, Saskatchewan Community Services, Regina.

Keyser, James
1986 The Evidence for McKean Complex Plant Utilization. *Plains Anthropologist* 31-113: 225-235.

Keyser, James and Carl Davis
1984 Lightning Spring: 4000 Years of Pine Parkland Prehistory. *Archaeology in Montana,* Vol.25, Nos. 2 and 3.

Keyser, James and Carl Davis (Continued)
1985 Lightning Spring and Red Fox: McKean Research in the Grand River Drainage. In McKean/Middle Plains Archaic: Current Research. M. Kornfeld and L. Todd, eds. Pp. 123-136. *Occasional Papers on Wyoming Archaeology , No. 4.*

Keyser, James and James Wettstaed
1991 Lightning Spring Test Excavation Report. Manuscript in possession of senior author.

Kornfeld, Marcel and George Frison
1985 McKean Site: A 1983 Preliminary Analysis. In McKean/Middle Plains Archaic: Current Research. M. Kornfeld and M. Todd, eds. *Occasional Papers on Wyoming Archaeology, Number 4.*

Kornfeld, Marcel and Marcel Todd (eds)
1985 McKean/Middle Plains Archaic: Current Research. *Occasional Papers on Wyoming Archaeology, Number 4.* Laramie.

Kullen, Douglas, J.C. Mackey, Thomas Reust and J. Elizabeth Sall
1983 The Cow Hollow Creek Site Preliminary Report on the 1982 Field Season. *The Wyoming Archaeologist*, March 1983.

Lahren, Larry
1976 The Myers-Hindman Site: An Exploratory Study of the Human Occupation Patterns in the Upper Yellowstone Valley from 7000 B.C. to A.D. 1200. Ph.d. Dissertation, University of Calgary, Alberta. Manuscript on file at the Montana State Historic Preservation Office.

Lataday, William, Jr. and Keith Dueholm
1984 A Preliminary Study of the Modern Vegetation and Possible Resources at the McKean Site. In McKean/Middle Plains Archaic: Current Research, M. Kornfeld and L. Todd, eds. Pp. 79-86. *Occasional Papers on Wyoming Archaeology* No.4.

Lewis, Rhoda
1984 Phytolith Analysis from the McKean Site, Wyoming. In McKean/Middle Plains Archaic: Current Research. M. Kornfeld and L. Todd, eds. Pp.45-50. *Occasional Pares on Wyoming Archaeology No. 4.*

Lobdell, John
1973 The Scoggin Site: An Early Middle Period Bison Kill. *The Wyoming Archaeologist.* Vol. XVI, No.3.

MacNeish, Richard S.
1958 *An Introduction to the Archaeology of Southeast Manitoba.* Bulletin 157, National Museum of Canada, Department of Northern Affairs and Indian Development. Ottawa.

MacNeish, Richard S. and K.H. Capes
1958 The United Church Site Near Rock Lake in Manitoba. *Anthropologica* 6: 119-155.

Melton, Douglas
1988 Variation in the Artifact Assemblages from Five Oxbow Sites. M.A. Thesis, University of Montana, Missoula, Montana. Manuscript on file at the Montana State Historic Preservation Office.

Metcalf, Michael
1987 Contributions to the Prehistoric Chronology of the Wyoming Basin. In *Perspectives on Archaeological Resources Management in the "Great Plains"*, Alan Osborn and Robert Hassler (eds): 233-261. I & O Publishing Company, Omaha.

Meyer, David (ed.)
1985 The Gravel Pit and Eastcott Flat Sites: Final Excavation Reports. *Nipawin Reservoir Heritage Study*, Vol.7.

Millar, James
1978 The Gray Site: An Early Plains Burial Ground. 2 vol. *Parks Canada Manuscript Report* No. 304.

1981 Mortuary Practices of the Oxbow Complex. *Canadian Journal of Archaeology* No. 5:103-117.

Miller, Mark and Jean Bedord
1984 Grinding Stones. In Artifact and Feature Descriptions. *The Wyoming Archaeologist*, 27(1-2):34-40.

Milne, Laurie Ann
1988 The Larson Site (D10n-3) and the Avonlea Phase in Southeastern Alberta. In *Avonlea Yesterday and Today: Archaeology and Prehistory.* Leslie B. Davis, editor.

Morris, Elizabeth, Richard Blakeslee, and Kevin Thompson
1985 Preliminary Description of McKean Sites in Northeastern Colorado. In McKean/Middle Plains Archaic: Current Research. M. Kornfeld and L. Todd, eds. Pp.45-50. *Occasional Papers on Wyoming Archaeology* No. 4.

Mulloy, William
1954 The McKean Site in Northeastern Wyoming. *Southwestern Journal of Anthropology* 10:432-460.

1958 A Preliminary Historical Outline for the Northern Plains. *University of Wyoming Publications* 22(1).

Munson, Gene
1990a Archaeological Investigations at 24RB1164. Report Prepared for Peabody Coal Company's Big Sky Mine, Area B Rosebud County, Montana, by GCM Services, Inc., Butte, Montana. Manuscript on file at the Montana State Historic Preservation Office.

1990b Archaeological Investigations of the Garfield Ranch Site 24GV117. Report Prepared for the Montana Department of Transportation, by GCM Services, Inc., Butte, Montana. Manuscript on file at the Montana State Historic Preservation Office.

1991 Archaeological Investigations at 24RB1145. Consultants report prepared for Peabody Coal Company by GCM Services, Inc., Butte, Montana. Manuscript on file at the Montana State Historic Preservation Office.

Munson, Gene and Dale Herbort
1985 Mitigation of Five Sites at Peabody Coal Company's Big Sky Mine Area A. Report prepared for Peabody Coal Company by Cultural Resources Division, Mineral Research Center, Butte, Montana.

Pollock, John
1981 Plains Archaic Complexes in the Alberta Parkland and Boreal Forest. *Canadian Journal of Archaeology* 5:145-153.

Quigg, Michael
1986 The Crown Site (FhNa-86) Excavation Results. *Nipawin Reservoir Heritage Study*, Vol.8.

Quigg, Michael (Continued)
1988 A Ceramic Bearing Avonlea Component in Southwestern Alberta. In *Avonlea Yesterday and Today: Archaeology and Prehistory*. Leslie B. Davis, editor.

Ramsay, Charles
1993 The Redtail Site: A McKean Habitation in South Central Saskatchewan. Unpublished M.A. thesis on file at the University of Saskatchewan, Saskatoon.

Reeves, Brian
1970 Cultural Dynamics in the Manitoba Grasslands 1000 B.C. - A.D. 700. In *Ten Thousand Years: Archaeology in Manitoba*, Walter M. Hlady (ed), pp. 153-174, Manitoba Archaeological Society.

1973 The Concept of an Altithermal Cultural Hiatus in Northern Plains Prehistory. *American Anthropologist* 75(5):1221-1253.

1978 Head-Smashed-In: 5500 Years of Bison-Jumping in the Alberta Plains. *Plains Anthropologist* 23(82) pt.2: 151-174.

1979 *Man, Mountains and Mammals: A View from the Canadian Alpine*. Paper presented at the Plains Conference, Denver, Colorado. November 1978.

1983 Culture Change in the Northern Plains 1000 B.C. --A.D. 1000. *Archaeological Survey of Alberta. Occasional Paper No. 20.*

1989 Unpublished management plan for Waterton Lakes National Parks.

Reider, Richard
1985 Soil Formation at the McKean Archaeological Site, Northeastern Wyoming. In McKean/Middle Plains Archaic: Current Research, M. Kornfeld and L. Todd, (eds). *Occasional Papers on Wyoming Archaeology No. 4*: pp.51-62.

Rittel, John
1990 Faunal analysis of bone from 24RB164. Contributing data within Archaeological Investigations at 24RB1164. Report prepared for Peabody Coal Company's Big Sky Mine, Area B Rosebud County, Montana, by GCM Services, Inc., Butte, Montana. Gene Munson (Author).

Roll, Tom E. (ed)
1982 Kootenai Canyon Archaeology, 1979 LAURD Project, Final Mitigation. MS on file at the Montana State Historic Preservation Office.

Rutherford, A., J.Wittenburg, and R. Wilmeth
1979 University of Saskatchewan Radiocarbon Dates VII. *Radiocarbon* 21(1):48-94.

1981 University of Saskatchewan Radiocarbon Dates IX. *Radiocarbon* 23(1):94-135.

1984 University of Saskatchewan Radiocarbon Dates X. *Radiocarbon* 26(2):241-292.

Sauchyn, David
1990 A Reconstruction of Holocene Geomorphology and Climate, Western Cyprus Hills, Alberta and Saskatchewan. *Canadian Journal of Earth Science* 27:1504-1510.

Scott, Karen West and Michael Wilson
1984 Dead Indian Creek Local Fauna. *The Wyoming Archaeologist*, 27(1-2):51-62.

Scott, Karen West and George Zeimens
1984 Lithic Materials and Stone Tools. In Artifact and Feature Descriptions. *The Wyoming Archaeologist*, 27(1-2):28-34.

Simpson, Caryl
1984 Projectile Points. In Artifact and Feature Descriptions. *The Wyoming Archaeologist*, 27(1-2):23-28.

Smith, Brian and Ernest Walker
1988 Evidence for Diverse Subsistence Strategies in an Avonlea Component. In *Avonlea Yesterday and Today: Archaeology and Prehistory*. Leslie B. Davis, editor.

Sparks, Theresa
1992 The Castor Creek Site: A Middle Prehistoric Period Campsite. Paper presented in partial fulfillment of the requirements for an honors baccalaureate degree, The University of Calgary.

Stallcop, Emmett
1966 The Distribution in North-Central Montana of Variant Basally Indented Projectile Points. *Archaeology in Montana*. 7(2):6-9.

Stallcop, Emmet and Paul English
1969 A Summary of Known Archaeological Sites in North Central Montana. *Archaeology in Montana* 10(3): 35-44.

Steege, Louis
1967 Happy Hollow Rock Shelter. *The Wyoming Archaeologist*, 10(3):11-36.

Strong, William Duncan
1935 An Introduction to Nebraska Archaeology. *Smithsonian Miscellaneous Collections*, Vol.93, No. 10.

Stuart, Glenn
1990 The Cranford Site (DIPb-2): A Multicomponent Stone Circle Site on the Oldman River. *Archaeological Survey of Alberta Manuscript Series No. 17.*

Stuckenrath, R. and J. Mielke
1970 Smithsonian Institution Radiocarbon Measurements VI. Radiocarbon 12(1):193-204.

Sturtevant, William (ed)
1986 *Handbook of the North American Indians: Great Basin*, Vol.11. Smithsonian Institution, Washington, D.C.

Sundstrom, Linea
1989 Culture History of the Black Hills with Reference to Adjacent Areas of the Northern Great Plains. *Reprints in Anthropology Volume 40.*

Syms, Leigh
1969 The Mckean Complex as a Horizon Marker in Manitoba and on the Northern Great Plains. Unpublished Masters thesis, the University of Manitoba.

Taylor, R.E.
1987 *Radiocarbon Dating: An Archaeological Perspective.* Academic Press, Inc. Orlando.

Toom, Dennis and Michael Gregg (eds)
1983 The Archaeology of the Mondrian Tree Site (32MZ58) McKenzie County, North Dakota. *Contribution No. 193.* Department of Anthropology and Archeology, the University of North Dakota, Grand Rapids.

Thoms, Alston
1987 Prehistoric Land Use in the Northern Rocky Mountains: A Perspective from the Middle Kootenai River Valley. *Center for Northwest Anthropology Project*, Report No.4. Washington State University, Pullman.

Tratebas, Alice
1985 McKean Settlement Patterns in the Black Hills: Suggestions for Future Research. In McKean/Middle Plains Archaic: Current Research, M. Kornfeld and L. Todd, (eds). *Occasional Papers on Wyoming Archaeology No. 4*: pp.137-145.

United States Department of Commerce
1968 *Climate Atlas of the United States*. Environmental Science Services Administration, Environmental Data Service. Asheville, North Carolina.

Van Dyke, Stanley, Thomas Head and Barbara Neal
1989 Section 3.0, Oldman River Dam Prehistoric Archaeology Mitigation Program, Campsites Component, A.S.A. Permit 88-39, Final Report. Report on file at the Archaeological Survey of Alberta, Edmonton.

Van Dyke, Stanley and Wendy Unfreed
1992 Section 1.0: 1990 Oldman River Dam Prehistoric Archaeology Mitigation Project - Campsites Programme- A.S.A Prmit 90-25 Final Report, Volume I. Consultants report prepared for Alberta Public Works, Supply and Services, Edmonton by Bison Historical Services Ltd., Calgary.

Vance, R.E., R.W. Mathews and J.J. Clague
1992 7000 Year Record of Lake-Level Change on the Northern Great Plains: A High Resolution Proxy of Past Climate. *Geology* 20:879-882.

Vickers, Chris
1949 Archaeological report 1948. Projects of the Historical and Scientific Society of Manitoba.

Waldman, Carl
1985 *Atlas of the North American Indian*. Facts on File Publications. New York.

Walker, Ernest
1980 The Gowen Site: An Early Archaic Site on the Northern Plains. Unpublished Ph.d. dissertation, The University of Texas at Austin. Manuscript on file with Ethos Consultants Inc., Havre.

Walker, Ernest (Continued)
1982 The Bracken Cairn: A Late Middle Archaic Burial from Southwestern Saskatchewan. *Saskatchewan Archaeology* 3:8-35.

1984 The Graham Site: A McKean Cremation from Southern Saskatchewan. *Plains Anthropologist* 29(104):139-150.

Wedel, Waldo
1961 Prehistoric Man on the Great Plains. University of Oklahoma Press, Norman.

Wendt, Gary
1990 Soil description, analysis, and interpretation at archaeological site 24RB1164, southeastern Montana. In Archaeological Investigations at 24RB1164. Report Prepared for Peabody Coal Company's Big Sky Mine, Area B Rosebud County, Montana, by GCM Services, Inc., Butte, Montana.

Wettlaufer, Boyd
1955 *The Mortlach Site in the Besant Valley of Central Saskatchewan.* Department of Natural Resources, Anthropological Series No.1. Regina.

Wettlaufer, Boyd and William Mayer-Oakes
1960 *The Long Creek Site.* Saskatchewan Museum of Natural History Anthropological Series No. 2.

Wettstaed, James
1990 Cultural Resources: Prehistoric Land Use Patterns in Southeastern Montana. United Staets Department of Agriculture, Forest Service, *Report No. 12.*

Wheeler, Richard
1952 A Note on the "McKean Lanceolate Point." *Plains Archaeological Conference Newsletter* 4(4): 39-44.

1954 Two New Projectile Point Types: Duncan and Hanna Points. *Plains Anthropologist* 1:7-14.

1958 Archaeological Remains in the Angostura Reservoir Area, South Dakota and in the Keyhole and Boysen Reservoir Area, Wyoming. Manuscript on file, River Basin Surveys. Lincoln.

Wheeler, Richard (Continued)
1985 The Middle Prehistoric Period in the Central and Northern Plains. In McKean/Middle Plains Archaic: Current Research. M. Kornfeld and L. Todd, eds. *Occasional Papers on Wyoming Archaeology No. 4*: pp.5-10.

Willey, Gordon and Phillip Phillips
1958 *Method and Theory in American Archaeology*. University of Chicago Press, Illinois.

Wilmeth, R. (ed)
1978 Canadian Archaeological Radiocarbon Dates (Revised Version). *National Museum of Man Mercury Series, Paper No.77*. Archaeological Survey of Canada, Ottowa.

Wilson, Michael
1975 The Cactus Flower Site Local Fauna. Appears as Appendix II in The Cactus Flower Site in Southeastern Alberta: 1972-1974 Excavations. *National Museum of Man, Mercury Series, Archaeological Survey of Canada Paper No. 46*. John Brumley (author).

Wormington, H.M. and Richard Forbis
1965 An Introduction to the Archaeology of Alberta, Canada. *Denver Museum of Natural History Proceedings*, No. 11.

Wright, Gary
1982 Notes on Chronological Problems on the Northwestern Plains and Adjacent High Country. *Plains Anthropologist* 27:145-160.

Yeck, R.D. and Fenton Gray
1972 Phytolith Size Characteristics Between Udolls and Ustolls. *Soil Science Society of America Proceedings* 36: 639-641.

Appendix:

Summary of radiocarbon dates for
McKean phase sites in the northern Plains.

The radiometric data used to graph the temporal distribution of the McKean phase in the northwestern Plains (Figure 14), is summarized in the following appendix. The data summary table is an abridged version of a comprehensive C-14 data base developed and maintained by John Brumley of Ethos Consultants Inc (Brumley1992). The portion of that database used for this thesis deals only with those dates reported as associated with a McKean phase site or assemblage. Because the database from which the appendix of this thesis was generated consists of more categories than can be contained within a 8.5" x 11" sheet of paper, information such as multiple references, longitude/latitude, calibrated dates, and intersite provenience of the organic materials which produced those dates were excluded. The radiocarbon data which is contained within the following appendix, however, should be sufficient to provide a building block for future research into the McKean phase.

Appendix: Summary of radiocarbon dates from McKean phase sites in the northern Plains.

Lab #	Sample #	Site #	State/ Province	Site Name	Site Type	Dated	Date BP	Christian Era	Sig. Err.	McKean Assoc.	Accepted/ Rejected	Reference
GX	1023	DiPj-3	AB	Layton	OC	IND	4150	2200BC	105	PP	AC	Davis 1972:223
RL	872	DjPo-47	AB	Maple Leaf	BKPA	UB	2800	850BC	140	PP	AC	Brumley Pers. Comm. 1979
AECV	60	DkPj-1	AB	Head-Smashed-In	BKPA	CH	2710	760BC	150	D,H,L	IND	Beaudoin 1987:206
S	782	EbOp-16	AB	Cactus Flower	OC	CH	4130	2180BC	85	H,L	AC	Brumley 1975:111
S	783	EbOp-16	AB	Cactus Flower	OC	CH	2130	180BC	130	L	RJ	Brumley 1975:111
S	784	EbOp-16	AB	Cactus Flower	OC	UB	3625	1725BC	80	D,H,L	AC	Brumley 1975:111
S	820	EbOp-16	AB	Cactus Flower	OC	UB	3890	1940BC	160	H	AC	Brumley 1975:111
S	822	EbOp-16	AB	Cactus Flower	OC	CH	3620	1670BC	95	D,H,L	AC	Brumley 1975:111
S	823	EbOp-16	AB	Cactus Flower	OC	CH	3615	1665BC	95	D,H	AC	Brumley 1975:111
S	1013	EbOp-16	AB	Cactus Flower	OC	CH	3930	1975BC	110	PP	AC	Rutherford et al. 1981:105
S	1209	EbOp-16	AB	Cactus Flower	OC	CH	3740	1790BC	100	H	IND	Rutherford et al. 1981.105
S	1210	EbOp-16	AB	Cactus Flower	OC	CH	4220	2270BC	130	H,L	IND	Rutherford et al. 1981.105
S	855	EdPc-1	AB	Majorville Cairn	CRN/MWHL	UB	2655	705BC	85	L	AC	Rutherford et al. 1979:70
S	856	EdPc-1	AB	Majorville Cairn	CRN/MWHL	UB	3845	1895BC	160	L	AC	Rutherford et al. 1979:70
A	1369	FlMh-2	AB	The Pas Reserve	OC	CH	3190	1240BC	60	D,H	AC	Ramsay 1993
S	1888	FlQs-30	AB	Grande Cache Lake	OC	CH	4605	2655BC	75	L	IND	Beaudoin 1987:211
GSC	660	GbOs-1	AB	Caribou Island	OC	CH	4200	2250BC	140	PP	AC	Wilmeth 1978:86
GAK	3797	IgOo-1	AB	Big Bay	OC	CH	0	AD1950	420	L	RJ	Wilmeth 1978:85
GAK	3798	IgOo-1	AB	Big Bay	OC	CH	1260	AD690	170	L	RJ	Wilmeth 1978:85
I	4418	5BL67	CO	Mount Albion	OC	CH	5300	3350BC	130	D,H,L	IND	Buckley 1976:183
I	6544	5BL120	CO	Fourth of July Valley	OC	CH	5880	3930BC	120	L	IND	Benedict & Olson 1973:325
I	6545	5BL120	CO	Fourth of July Valley	OC	CH	6045	4095BC	120	L	IND	Benedict & Olsen 1973:325
UGA	736	5CR1	CO	Draper Cave Series	HMBR/RS	CH	3520	1570BC	70	PP	IND	Brandau & Noakes 1978:493
UGA	737	5CR1	CO	Draper Cave Series	HMBR/RS	CH	3480	1530BC	65	PP	IND	Brandau & Noakes 1978:493
UGA	453	5LG101	CO	Dipper Gap	OC	CH	3410	1460BC	90	D,H,L	AC	Frison 1978:47
UGA	455	5LG101	CO	Dipper Gap	OC	CH	3520	1570BC	85	D,H,L	AC	Frison 1978:47
UGA	456	5LG101	CO	Dipper Gap	OC	CH	3180	1230BC	90	D,H,L	AC	Frison 1978:47

Appendix: Continued.

Lab #	Sample #	Site #	State/ Province	Site Name	Site Type	Dated	Date BP	Christian Era	Sig. Err.	McKean Assoc.	Accepted/ Rejected	Reference
Beta	6847	5LK144	CO	Kinney Spring	OC	IND	3250	1300BC	80	D,H,M	AC	Morris et al. 1985
Beta	7330	5LK144	CO	Kinney Spring	OC	IND	3110	1160BC	130	D,H,M	AC	Morris et al. 1985
Beta	7333	5LK144	CO	Kinney Spring	OC	IND	3800	1850BC	70	D,H,M	AC	Morris et al. 1985
Beta	3869	5LK161	CO	Phoebe Rock Shelter	RS	CH	3570	1620BC	60	D,H	AC	Morris et al. 1985
Beta	3870	5LK161	CO	Phoebe Rock Shelter	RS	CH	3890	1940BC	60	D,H	AC	Morris et al. 1985
Beta	2285	5LK170	CO	Pack Rat Rock Shelter	RS	IND	2440	490BC	80	D,H,L,M	AC	Morris et al. 1985
Beta	2286	5LK170	CO	Pack Rat Rock Shelter	RS	IND	2760	810BC	100	D,H,L,M	AC	Morris et al. 1985
Beta	2288	5LK170	CO	Pack Rat Rock Shelter	RS	IND	2480	530BC	90	D,H,L,M	AC	Morris et al. 1985
UGA	671	IND	CO	Spring Gulch	RS	IND	2830	880BC	135	D,H,L,M	AC	Morris et al. 1985
UGA	672	IND	CO	Spring Gulch	RS	IND	3095	1145BC	75	D,H,L,M	AC	Morris et al. 1985
UGA	1047	IND	CO	Spring Gulch	RS	IND	3700	1750BC	105	D,H,L,M	AC	Morris et al. 1985
UGA	1048	IND	CO	Spring Gulch	RS	IND	3855	1905BC	350	D,H,L,M	AC	Morris et al. 1985
M	1004	IND	CO	LoDaiska	OC	CH	3400	1450BC	200	PP	IND	Crane & Griffin 1962:197
GX	5049	IND	MB	C5-b	OC	CH	3535	1585BC	175	PP	IND	Buchner 1979:128
GX	5048	IND	MB	C5-b	OC	CH	3730	1780BC	160	PP	IND	Buchner 1979:128
DIC	1218	IND	MB	C5-b	OC	CH	3700	1750BC	100	PP	IND	Buchner 1979:128
I	691	24CB202	MT	Sorenson	OC	CH	4900	2950BC	250	PP	IND	Husted 1969
W	1135	24PA401	MT	Rigler Bluffs	OC	CH	4900	2950BC	300	H	IND	Haines 1966
GREY	29	24PA401	MT	Rigler Bluffs	OC	CH	5040	3090BC	150	H	IND	Haines 1966
GAK	2630	24PA504	MT	Myers-Hindman	OC	UB	3150	1200BC	110	D,H,L	IND	Lahren 1976
Beta	2966	24PH8	MT	Johnson Bison Kill	HMBR	CH	3230	1280BC	100	IND	IND	Davis 1982c:11
Beta	3182	24PH8	MT	Johnson Bison Kill	HMBR	UB	3250	1300BC	70	IND	IND	Davis 1982c:11
Beta	3001	24PH8	MT	Johnson Bison Kill	HMBR	UB	3720	1770BC	80	IND	IND	Davis 1982c:11
Beta	33625	24RB1164	MT	No name assigned	OC	CH	2200	250BC	160	D,H,M	RJ	Munson 1990b
Beta	33626	24RB1164	MT	No name assigned	OC	CH	2570	620BC	60	D,H,M	AC	Munson 1990b
Beta	35225	24RB1164	MT	No name assigned	OC	UB	3310	1360BC	90	D,H,M	AC	Munson 1990b
SI	479	32BO213	ND	Red Fox	OC	CH	3770	1820BC	90	D,H	IND	Stuckenrath & Mielke 1970

Appendix: Continued.

Lab #	Sample #	Site #	State/ Province	Site Name	Site Type	Dated	Date BP	Christian Era	Sig. Err.	McKean Assoc.	Accepted/ Rejected	Reference
UCR	1324	32MZ58	ND	Mondrian Tree	OC	CH	3550	1600BC	85	D	AC	Toom and Gregg 1983
UCR	1326	32MZ58	ND	Mondrian Tree	OC	CH	3560	1610BC	170	D	AC	Toom and Gregg 1983
UCR	1325	32MZ58	ND	Mondrian Tree	OC	CH	3580	1630BC	170	D	AC	Toom and Gregg 1983
UCR	1323	32MZ58	ND	Mondrian Tree	OC	CH	3745	1795BC	170	D	AC	Toom and Gregg 1983
UCR	1328	32MZ58	ND	Mondrian Tree	OC	CH	4010	2060BC	160	D	AC	Toom and Gregg 1983
UCR	1322	32MZ58	ND	Mondrian Tree	OC	CH	4030	2080BC	110	D	AC	Toom and Gregg 1983
M	368	39FA68	SD	Kolterman	OC	CH	3630	1680BC	350	PP	IND	Frison 1978:47
M	369	39FA68	SD	Kolterman	OC	CH	4230	2280BC	350	PP	IND	Frison 1978:47
WIS	1085	39FA302	SD	George Hey	OC	CH	3930	1980BC	70	PP	AC	Bender et al. 1981.148-149
WIS	1086	39FA302	SD	George Hey	OC	CH	3520	1570BC	70	PP	AC	Bender et al. 1981:148-149
TX	4081	39HN204	SD	Lightning Spring	OC	CH	3850	1900BC	150	D,H	AC	Keyser & Davis 1984:12
TX	4082	39HN204	SD	Lightning Spring	OC	CH	3870	1920BC	210	D,H	AC	Keyser & Davis 1984:12
TX	4083	39HN204	SD	Lightning Spring	OC	CH	4190	2240BC	110	D,H	AC	Keyser & Davis 1984:12
TX	4084	39HN204	SD	Lightning Spring	OC	CH	3430	1480BC	270	D,H	AC	Keyser & Davis 1984:12
--	--	39HN204	SD	Lightning Spring	OC	--	4040	2090BC	90	D,H	AC	Keyser and Wettstaed 1991
--	--	39HN204	SD	Lightning Spring	OC	--	4200	2250BC	170	D,H	AC	Keyser and Wettstaed 1991
IND	IND	IND	SD	Gant	OC	CH	4130	2180BC	130	PP	AC	Hurt 1960
S	63	DgMr-1	SK	Long Creek	OC	CH	3370	1420BC	115	H	IND	Wilmeth 1978:104-105
S	63	DgMr-1	SK	Long Creek	OC	CH	4520	2570BC	170	H	A/R	Wilmeth 1978:104-105
S	2	EcNl-1	SK	Mortlach	OC	UB	3400	1450BC	200	D,H	AC	Wettlaufer 1955
S	1770	EiNs-4	SK	Sjovold	OC	UB	4130	2180BC	205	H	IND	Dyck 1983:90
S	2062	EiNs-4	SK	Sjovold	OC	UB	3530	1580BC	115	H	IND	Ramsay 1993
S	2053	EkNv-36	SK	Billet	OC	CH	1560	AD390	160	H	IND	Rutherford et al. 1984:290
S	2054	EkNv-36	SK	Billet	OC	UB	3100	1150BC	135	H	IND	Rutherford et al. 1984:290
S	1574	FaNq-30	SK	Graham	HMBR	BB	3245	1295BC	50	D	IND	Rutherford et al. 1981:129
S	3373	FbNp-10	SK	Redtail	OC	UB	3470	1520BC	80	H	AC	Ramsay 1993
S	3372	FbNp-10	SK	Redtail	OC	UB	3480	1530BC	80	H	AC	Ramsay 1993

Appendix: Continued.

Lab #	Sample #	Site #	State/ Province	Site Name	Site Type	Dated	Date BP	Christian Era	Sig. Err.	McKean Assoc.	Accepted/ Rejected	Reference
S	3008	FbNp-10	SK	Redtail	OC	UB	3660	1710BC	75	H	AC	Ramsay 1993
S	3374	FbNp-10	SK	Redtail	OC	UB	3860	1910BC	70	D,L	AC	Ramsay 1993
S	3375	FbNp-10	SK	Redtail	OC	UB	3880	1930BC	70	D,L	AC	Ramsay 1993
S	3009	FbNp-10	SK	Redtail	OC	UB	4280	2330BC	80	L	AC	Ramsay 1993
S	2557	FnHa-86	SK	Crown	OC	AN	2010	60BC	100	D,H	RJ	Quigg 1986:32
S	2292	FnHa-86	SK	Crown	OC	UB	3300	1380BC	110	D,H	AC	Quigg 1986:32
S	2291	FnHa-86	SK	Crown	OC	UB	3425	1475BC	105	D,H	AC	Quigg 1986:32
S	2554	FnHa-86	SK	Crown	OC	UB	3600	1650BC	80	D,H	AC	Quigg 1986:32
S	2556	FnHa-86	SK	Crown	OC	UB	3605	1655BC	120	L	AC	Quigg 1986:32
S	2524	FnHa-86	SK	Crown	OC	UB	3610	1660BC	105	L	AC	Quigg 1986:32
S	2521	FnHa-86	SK	Crown	OC	UB	3825	1875BC	75	L	AC	Quigg 1986:32
S	2369	FnHa-86	SK	Crown	OC	UB	3825	1875BC	90	L	AC	Quigg 1986:32
S	2526	FnHa-86	SK	Crown	OC	UB	3995	2045BC	8	L	AC	Quigg 1986:32
S	2290	FnHa-86	SK	Crown	OC	UB	4180	2230BC	115	L	AC	Quigg 1986:32
S	2525	FnHa-86	SK	Crown	OC	UB	4295	2345BC	85	L	AC	Quigg 1986:32
S	2520	FnHa-86	SK	Crown	OC	UB	4310	2360BC	115	L	AC	Quigg 1986:32
SI	239	48BH206	WY	Bottleneck	RS	CH	3820	1870BC	200	D,H,L	AC	Syms 1969
RL	389	48BH330	WY	Granite Creek RS	RS	IND	4700	2750BC	130	PP	IND	Frison & Wilson 1975
RL	1080	48BH346	WY	Beehive	OC	IND	3570	1620BC	140	PP	IND	Frison 1988:159
RL	482	48BH349	WY	Paint Rock V	RS	CH	4310	2360BC	140	PP	IND	Frison & Wilson 1975
RL	668	48BH364	WY	Southsider Cave	RS	IND	3900	1950BC	140	PP	IND	Frison 1978:26
RL	672	48BH364	WY	Southsider Cave	RS	IND	4170	2220BC	150	D,H	IND	Frison 1978:26
RL	97	48BH499	WY	Medicine Lodge Creek	RS	IND	3740	1790BC	150	PP	IND	Frison & Wilson 1975
RL	442	48BH499	WY	Medicine Lodge Creek	RS	IND	3750	1800BC	260	PP	IND	Frison & Wilson 1975
RL	98	48BH499	WY	Medicine Lodge Creek	RS	IND	3980	2030BC	160	PP	IND	Frison & Wilson 1975
RL	438	48BH499	WY	Medicine Lodge Creek	RS	IND	4050	2100BC	150	PP	IND	Frison & Wilson 1975
RL	805	48CA75	WY	Cordero Mine	BKPA	CH	3520	1570BC	160	H	AC	Frison 1991

Appendix: Continued.

Lab #	Sample #	Site #	State/ Province	Site Name	Site Type	Dated	Date BP	Christian Era	Sig. Err.	McKean Assoc.	Accepted/ Rejected	Reference
C	667	48CK4	WY	Belle Rockshelter	RS	CH	1646	AD304	200	PP	RJ	Frison 1978:47
RL	1859	48CK7	WY	McKean	OC	CH	1920	AD30	120	D,H,L	IND	Kornfeld and Frison 1985
RL	1861	48CK7	WY	McKean	OC	CH	4590	2640BC	160	D,H,L	AC	Kornfeld and Frison 1985
RL	1860	48CK7	WY	McKean	OC	CH	3790	1840BC	140	D,H,L	AC	Kornfeld and Frison 1985
IND	IND	48CK7	WY	McKean	OC	CH	*3287	1337BC	600	D,H,L	AC	Mulloy 1954
RL	470	48CK303	WY	Hawken II	BKPA	IND	4250	2300BC	140	PP	IND	Frison1978:47
RL	174	48CR304	WY	Scoggin	BKPA	CH	4540	2590BC	110	L,M	IND	Lobdell 1973
A	483	48JO303	WY	Powder River Canyon	RS	CH	3450	1500BC	40	PP	IND	Frison 1978
A	485	48JO303	WY	Powder River Canyon	RS	CH	3980	2030BC	70	PP	IND	Frison 1978
A	483	48JO303	WY	Grey-Taylor	OC	CH	3450	1500BC	40	PP	AC	Syms 1969
A	485	48JO303	WY	Grey-Taylor	OC	CH	3980	2030BC	70	PP	AC	Syms 1969
I	1428	48PA201	WY	Mummy Cave	RS	CH	4420	2470BC	150	D,H,L	IND	Husted & Edgar n.d.
RL	321	48PA551	WY	Dead Indian Creek	OC	IND	3800	1850BC	110	D,H,L,O,P,Y	IND	Frison 1978:47
W	2597	48PA551	WY	Dead Indian Creek	OC	IND	4180	2230BC	250	D,H,L,O,P,Y	IND	Frison 1978:47
W	2599	48PA551	WY	Dead Indian Creek	OC	IND	4430	2480BC	250	D,H,L,O,P,Y	IND	Frison 1978:47
Grey	25	48WA304	WY	Leigh Cave	RS	IND	4170	2220BC	150	PP	IND	Frison 1978:47
DIC	1375	IND	WY	Lawrence	IND	IND	4440	2490BC	75	PP	IND	Wright 1982:154

Abbreviations:

AB = Alberta; CO = Colorado; MB = Manitoba; MT= Montana; ND = North Dakota; SD = South Dakota; SK = Saskatchewan; WY = Wyoming

BKPA = Bison kill/processing area; CRN/MWHL = Cairn/medicine wheel; HMBR = Human burial; OC = Open campsite; RS = Rockshelter

AN = Antler; CH = Charcoal; IND = Indeterminate; UB = Unburned bone

PP = Unspecified McKean phase point; D = Duncan; H = Hanna; L = McKean Lanceolate; M = Mallory; O = Oxbow; P = Pelican Lake; Y = Yonkee

AC = Accepted; A/R = Accepted by some, but rejected by others; RJ = Rejected

* = C-14 date was estimated using Libby half-life values

Dates reflect uncalibrated age