

THE AMISK SITE:
A MULTI-COMPONENT CAMPSITE
IN SOUTH-CENTRAL SASKATCHEWAN

A Thesis

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in the
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by

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ABSTRACT

The Amisk site is a stratified archaeological site containing the remains of at least eight and possibly nine occupations over the past five millennia. A variety of subsistence activities occurred at the site during these occupations such as food processing and preparation, tool making and tool repair. This combination of activities is characteristic of a habitation area. The Amisk site, therefore, represents a series of campsites adjacent to a small meandering stream. In this respect the Amisk site can be seen as analogous with other archaeological sites in Saskatchewan such as the Long Creek site, the Mortlach site, the Garratt site, the Oxbow Dam site as well as a number of sites in the Tipperary Creek valley including the Newo Asiniak site and the Tipperary Creek site which are presently being studied. Artifactual and chronological evidence supports and strengthens our understanding of the cultural chronology of southern Saskatchewan with projectile points and radiocarbon dates which corroborate existing data from the Oxbow complex and the Late Side-Notched series.

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1.0 INTRODUCTION

The Amisk site, FbNp-17, is a multi-component prehistoric campsite on a hillwash slope in the Tipperary Creek valley just north of Saskatoon, Saskatchewan. It was discovered in 1982 as a part of an archaeological resource assessment of the Wanuskewin Heritage Park for the Meewasin Valley Authority (Walker, 1983). The site was excavated during two field seasons beginning in May 1984 and ending in August 1985. A description of the Amisk site is given here based on the artifacts, faunal remains and features recovered and recorded during these excavations.

The object of this thesis is to present the methods and techniques used in the excavation and analysis of the Amisk site; to describe the biophysical environment of the site area; to provide description and analysis of each of the cultural layers and its contents; to use this evidence to interpret the events and activities which occurred at each level; and to fit the Amisk site into the prehistory of southern Saskatchewan. It is hoped that this research will ultimately make a contribution to the overall development plan proposed for the Wanuskewin Heritage Park.

The thesis begins with a description of the modern environment of the site area. Dominant influences on the

character of this environment include its proximity to a major, permanent water source, the South Saskatchewan River, in an otherwise semi-arid area as well as the glacial history of the region which is responsible for its underlying geomorphology. Chapter 3 is a compilation of data on the prehistory of southern Saskatchewan, as it is presently understood, to provide a cultural/temporal framework in which to examine the Amisk site. A major component of this prehistory is a big game hunting strategy which was overwhelmingly dependent upon bison. Chapter 4 is an outline of the research design and methodology employed at the Amisk site. Great attention was paid to excavation and recording techniques as this site, along with the adjacent Newo Asiniak site (FbNp-16), is a testing ground for methodologies to be used in the excavation of other, more complex sites in the Wanuskewin Heritage Park. Chapter 5 is a discussion of stratigraphy, both sedimentary and cultural. There are seven cultural layers at the Amisk site which are well separated by colluvial sediments. Cultural layer one includes as many as three occupations while the remaining six appear to be single occupations. This stratigraphic section spans all of post glacial time and includes cultural materials of the past 5,400 years. Chapter 6 provides the analysis and description of archaeological materials; artifacts, features and faunal remains, level by level and suggests the function and nature of each occupation. Chapter 7 compares the Amisk site to other sites in the region.

Cultural levels 4, 5 and 6 have been identified as belonging to the Oxbow complex by the presence of diagnostic projectile points. B.E. Spurling and B.F. Ball (1981), in a comparative and quantitative analysis of Oxbow components on the Northwestern Plains, have proposed that published dates for these components can be organized into five classes and that ages represented by these classes generally decrease with an increase in latitude. This thesis presents the Oxbow data according to this temporal/locational framework thereby testing its validity in the study of the Oxbow complex. Spurling and Ball have applied Binford's (1980) terminology in the description of site type be it residential base or field camp. Following their lead, this thesis takes a similar approach to the description of site type based on artifact assemblages of cultural levels which contain diagnostic artifacts.

Cultural level 1 contains artifacts of the Late Side-Notched series including Avonlea, Prairie Side-Notched and Plains Side-Notched type projectile points. Although the projectile point collection is limited and radiocarbon dates are varied in this level, the possibility that an occupation representing a transitional phase between Avonlea and Prairie Side-Notched, as suggested by Adams (1977), is examined. Whether cultural level 1 represents 2 or 3 occupations depends upon whether this transitional phase actually occurs at the Amisk site.

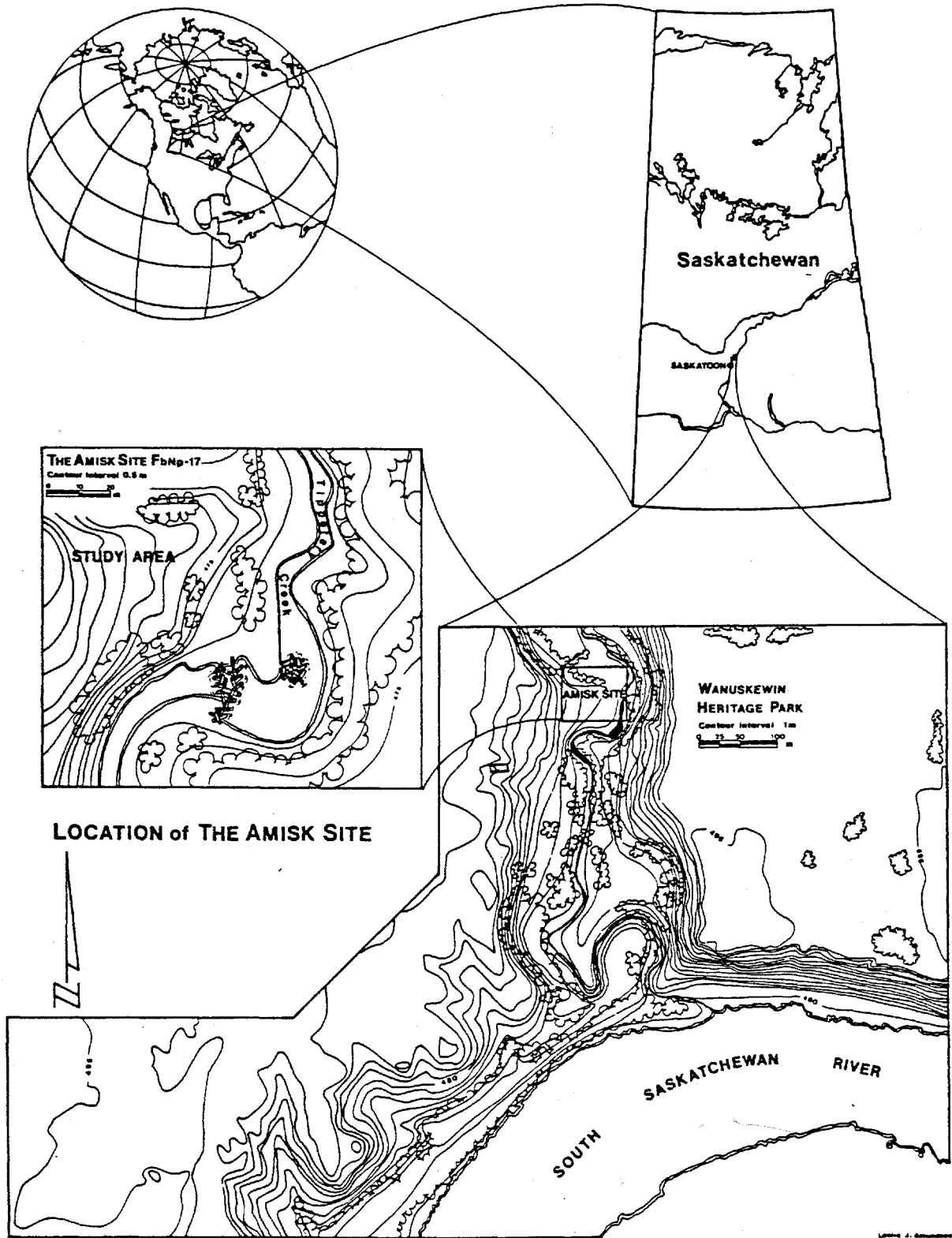
2.0 BIOPHYSICAL ENVIRONMENT OF THE AMISK SITE

2.1 Site Location

The study area is located in south-central Saskatchewan approximately 2.5 kilometers north of the city of Saskatoon in the northwest quarter of the southwest quarter of section 36, township 37, range 5, west of the third meridian (Figure 1). The Amisk Site is one of 17 identified heritage sites in the Wanuskewin Heritage Park. Tipperary Creek is a small meandering stream running through this park which has cut a relatively deep valley into the till-plain north of the South Saskatchewan River. The Amisk Site is situated in this valley 450 meters north of where the creek empties into the river (Figure 1).

At 52 degrees, 13', 25" North Latitude and 106 degrees, 36', 30' West Longitude, the Amisk Site is located within the large physiographic region known as the Saskatchewan Rivers Plain Region. This area is characterized by ground moraines and glacial lake plains which create a gentle topography that shows remarkably little change over vast distances. Some variety is provided by features such as river valleys, glacial outwash channels, dunes associated with glacial outwash, and areas of hummocky till. Also common are

FIGURE 1



many pot-holes or kettles which are surrounded by willow and poplar (Richards 1969: 41).

The Amisk Site sits near the southern margin of a broad zone of prairie vegetation described as Aspen Parkland (Bird 1961). This area represents the transition to a Mid-grass Prairie vegetation immediately to the south of Saskatoon. The sparse trees and prairie grasses which cover the Wanuskewin Heritage Park are evidence of this transition.

2.2 Site Physiography

The Amisk site was discovered in 1982 during archaeological reconnaissance of the Tipperary Creek area (Walker 1983). It was named "Amisk", which is a Cree word meaning "beaver", due to the presence of beaver dams, a beaver lodge and other evidence of beaver activities in the creek channel immediately adjacent to the site area. The site is located on a prominent spur which extends into the creek valley from the west side approximately 60 meters south of the present northern limit of the Wanuskewin Heritage Park property (Figure 1, Plates 1, 2 and 3). The surface area of the spur is about 3400 square meters. Controlled test excavations suggest that archaeological materials are buried beneath most of this area. The prominent nature of the spur, which exhibits a relatively steep grade of approximately 7.5%, and the lack of meander scars on its surface indicate that it is not a point bar deposit of the creek but rather a product

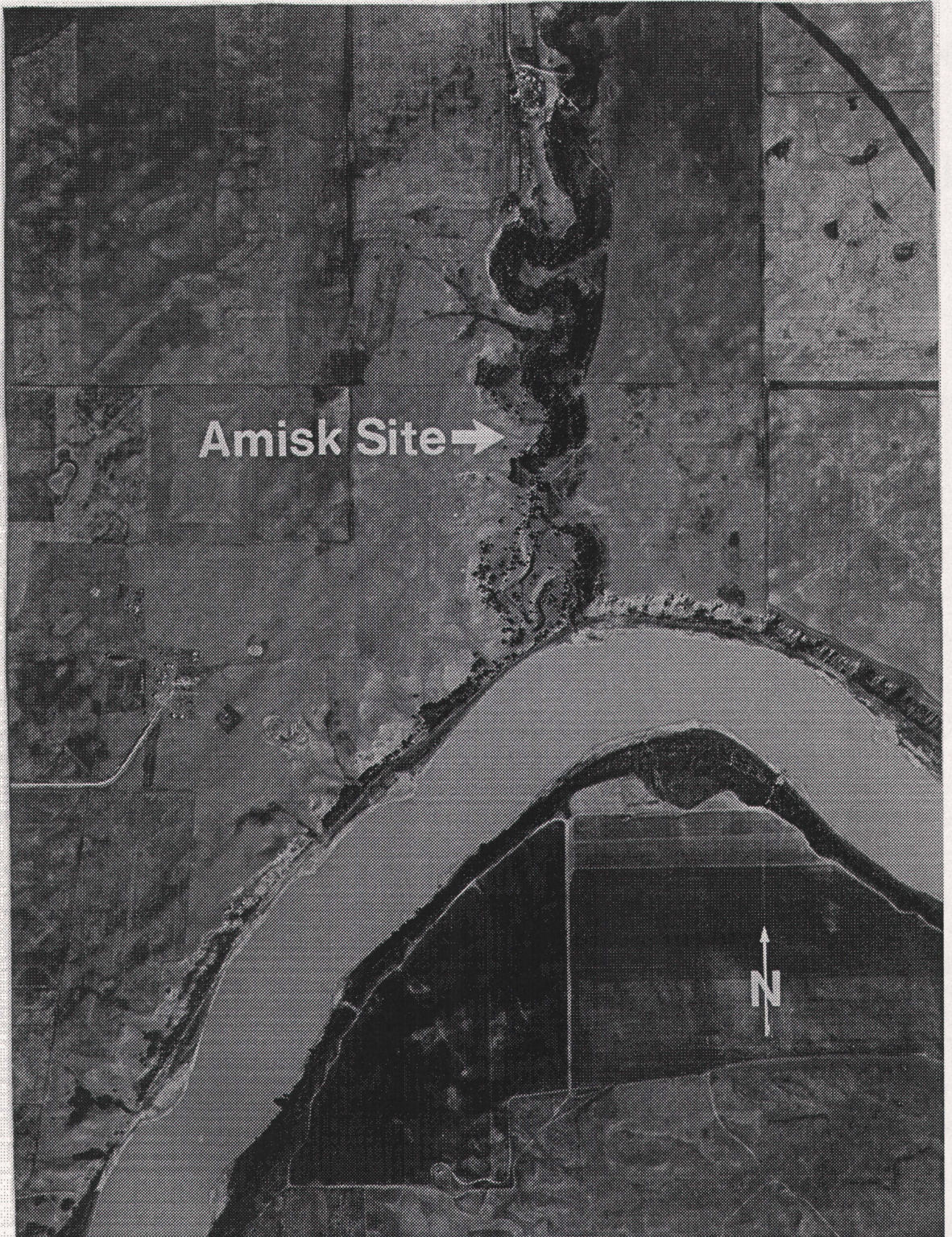


PLATE 1. Aerial view of site area.



PLATE 2. Site Area Looking West

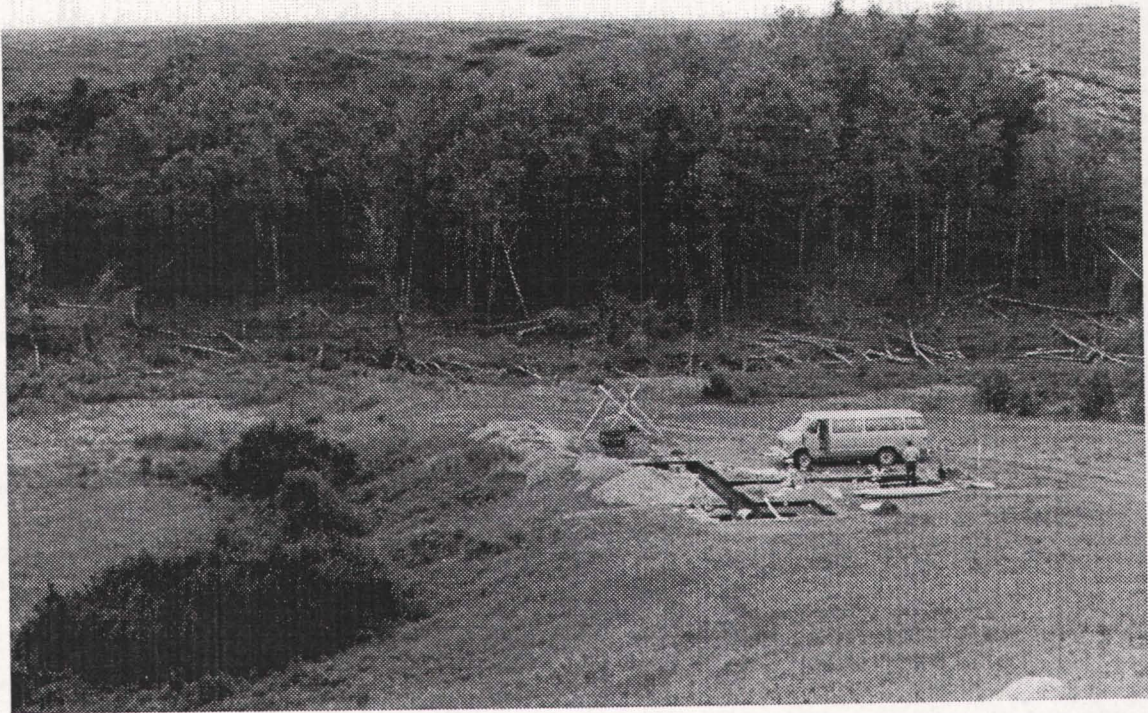


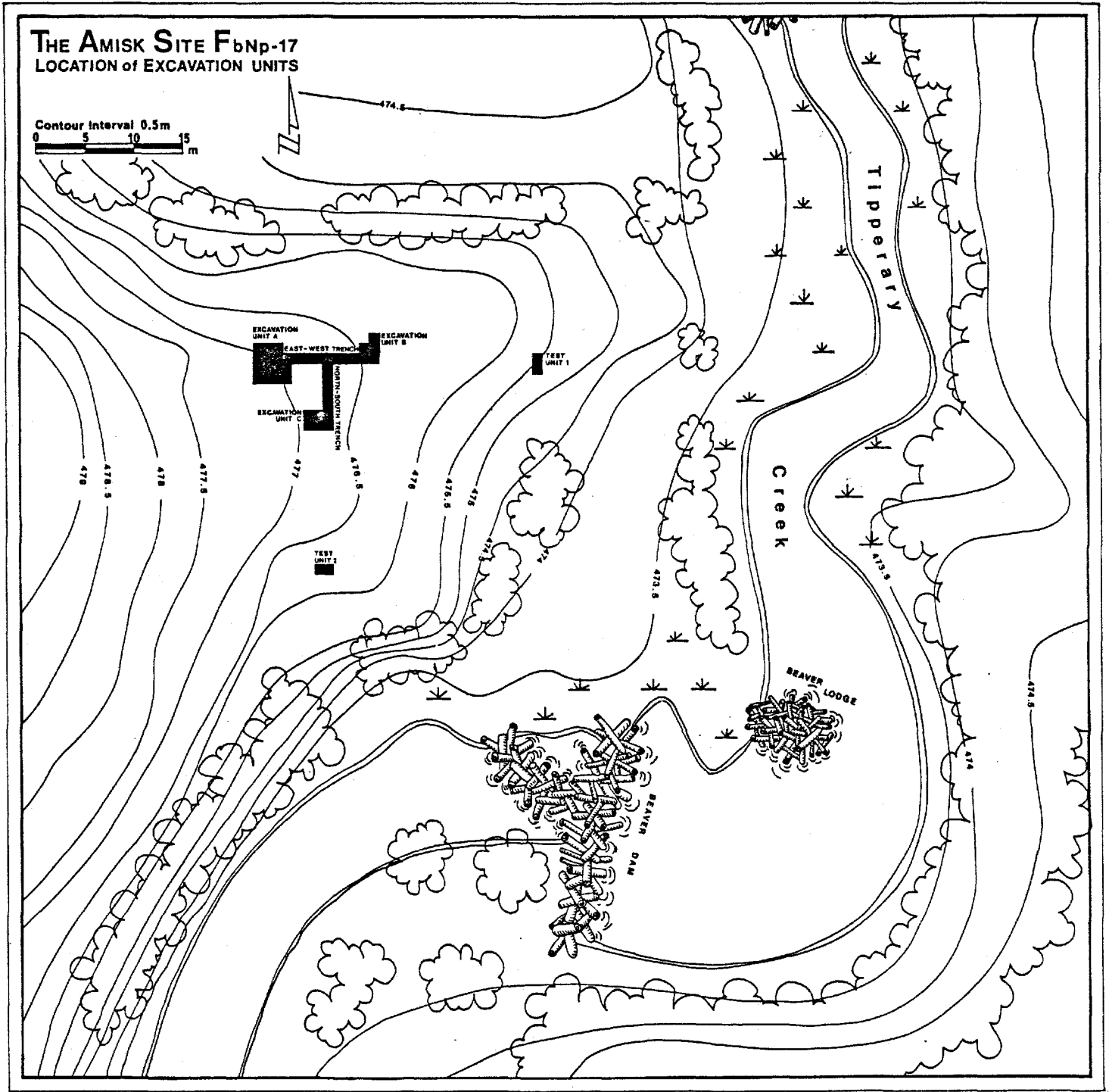
PLATE 3. Site Area Looking East

of hill-wash and possibly wind-borne sediments. The spur has been shaped by the creek into its present, roughly triangular form (Figure 2).

The spur also represents a projection of the shortgrass prairie vegetation into the creek valley. The slope of this landform and its elevation above the valley floor are responsible for its retention of the soil moisture characteristics of the plain adjacent to the valley. For this reason, it retains the same vegetation as the plain regardless of its close proximity to the creek and represents a projection of the drier uplands into the more lush valley micro-environment. The top surface of the spur supports no trees or shrubs. The side slopes are covered on the north by thorn thickets and on the east and south by aspen and willow.

The soils of the Amisk Site area are designated as Hillwash typical of riverine areas (Acton and Ellis 1978). Hillwash is described as "Regosolic, Chernozemic and Podzolic soils developed on colluvial and eroded deposits on the slopes of valleys and escarpments" (Acton and Ellis 1978: 65). The site area is bounded on the western upland by soils of the Bradwell Association in a complex with glacial tills of the Weyburn Association. According to Acton and Ellis (1978), "the Bradwell Association consists of a group of Chernozemic Dark Brown soils formed under a grassland vegetation. These soils have formed in medium to moderately fine textured, moderately calcareous, sandy glacio-lacustrine deposits and

FIGURE 2



occur primarily on nearly level and undulating landscapes". The Weyburn Association is in every way similar to the Bradwell Association except that it is developed on unsorted glacial till rather than glacio-lacustrine sands (Acton and Ellis 1978). This soil complex is indicative of the ontogeny of the plain bordering the west slope of Tipperary Creek. Retreating glacial ice laid down a veneer of till while meltwater lakes deposited lacustrine sands. More specifically, the soils on this upland to the west of the creek are described by Acton and Ellis (1978) as Orthic Dark Brown and Eluviated Dark Brown on very gently undulating or very gently sloping, shallow lacustrine plains with a knoll and depression type of topography. The soil is classed as slightly to moderately stoney.

Uplands on the eastern margin of Tipperary Creek are different in character. The soil here is a complex of the Weyburn and Asquith Associations. The Asquith Association is similar in origin to the Bradwell Association described above but is characterized by more coarsely textured soils (Acton and Ellis 1978). As on the west side, soils are here developed upon a combination of glacial till and glacio-lacustrine sands. Acton and Ellis describe the soil on this eastern upland as Orthic Dark Brown, Calcareous Dark Brown and Gleysolic fine, sandy loams. These are developed on a glacial till plain with a gently sloping or roughly undulating knoll and depression topography. The Gleysols, which are soils found in isolated areas of poor drainage,

occur in these depressions (Acton and Ellis 1978: 26). The area is locally dissected by gullies and is described as very stoney (Acton and Ellis 1978).

2.3 Climate

The modern climatic regime in the study area is designated Dfb in the Koppen-Geiger system of climatic classification (Chakravarti 1969). This is a continental climate characterized as cold, subhumid with cold winters and cool summers. The mean January temperature recorded over a thirty year period is -17.3 degrees Celsius. The mean range in temperature for January is from a maximum of -6 to a minimum of less than -37 degrees Celsius. At the other extreme, in the month of July for the same recording period, the mean temperature is 19.1 degrees Celsius. The range of temperatures is from a maximum of more than 33 to a minimum of 5 degrees Celsius. The mean number of frost free days was 113 during the measurement period (Bergsteinsson and Calvert 1977).

The mean annual precipitation is from 35 cm to 40 cm including a mean annual snowfall of 101 cm to 114 cm, (10 cm of snow is equivalent to 1 cm of rain in the measurement of precipitation). The majority of precipitation, about 70%, falls in May through September. June and July are the months in which there is the greatest rainfall (Chakravarti 1969). Winds in the Saskatoon area are predominately westerlies.

Northwest, east, southeast and southwest winds are, however, not uncommon (Bergsteinsson and Calvert 1977).

2.4 Flora and Fauna

A description of the modern biotic environment will not only present the reader with an idea of the character of the site area, but can also provide evidence for the character of the area in the past. This type of generalized palaeoenvironmental reconstruction must, of course, be augmented with palynological, palaeozoological and sedimentological studies to provide specific details of the environment in the past, especially since the climate in this area is known to have been markedly different in the recent past.

The Wanuskewin Heritage Park Master Plan (Landplan 1984) includes a detailed description of the flora and fauna present in the Tipperary Creek valley and the adjacent uplands. As mentioned previously the study area is located at the southern margin of the Aspen Parkland Ecotone. This ecotone represents a transition from the coniferous forests of the north to the mixed prairie grasslands of the south. Two major plant communities, aspen groves and grasslands, occur in this zone and are distributed in irregular patches. The grasslands dominate the study area due to its proximity to the southern limit of the ecotone. Aspen groves are isolated to areas of appropriate topography and soil moisture conditions. The

distribution of vegetative communities in the Wanuskewin Heritage Park is governed by topography, soil moisture, proximity to the creek and proximity to the South Saskatchewan River.

Characteristic of the till plain which surrounds Tipperary Creek is the Upland Prairie Zone here comprised of two vegetative communities. Dominant is the native grass complex. Speargrass and northern wheatgrass are the most abundant species. Little blue stem, blue grama grass, porcupine grass, three flowering avens, prairie crows, and harebells are common as well. Another plant association in the Upland Prairie Zone represented at Tipperary Creek consists of dense shrub thickets of prairie rose, western snowberry and silverberry. These thickets are restricted to the plain east of the creek valley and are associated with depressions which provide the proper soil (gleysols) and moisture conditions.

Of major importance to the biotic environment of Tipperary Creek is its proximity to the South Saskatchewan River. The Valley Slope Zone includes three major plant communities whose occurrence is directly related to the decreasing influence, with distance, of the river and creek. On stable valley slopes and in areas transitional between lowlands and slope zones are the Mixed Deciduous Tree/Shrub Association and the Poplar/Shrub Association. Both associations are characterized by a well established overstory

and understory with a sparse herb-graminoid tier. The overstory component generally consists of a number of tree species including Manitoba maple, water birch, balsam poplar, plains cottonwood, willow and chokecherry. The understory component includes northern gooseberry, western snowberry, woods rose, chokecherry, saskatoon berry and yellow willow.

Common to unstable slopes and areas of active slumping is a vegetation much like the upland zone. This dominantly grass vegetation is associated here with herbs and shrubs to form the Mixed Grass/Shrub Association. Characteristic species include blue grama grass, wild barley, june grass, pasture sage, goldenrod, creeping juniper, bearberry, prairie rose and yarrow.

Occupying the lowlands of the study area is a vegetative zone related to the periodic presence of flood waters. The Ash-Maple/Meadow Association is located on terraces of Tipperary Creek and includes an overstory of red ash and Manitoba maple. Immediately bordering the creek channel is a thirty meter band of shrubs consisting of red osier dogwood, wolf willow, yellow willow, sandbar willow, waterbirch, silverberry, buckthorn and western snowberry. Also in the immediate vicinity of the creek channel is the Marsh/Channel Association whose distribution is dependant upon the presence of water. The ephemeral nature of Tipperary Creek is responsible for the variable occurrence of this vegetative community which is especially prominent near beaver ponds and

springs, both of which can be found in the Amisk site area. Typical species are water sedge, cattail, early blue violet, beaked sedge, lesser dockweed, marsh marigold and water parsnip. Walker (1983) provides an inventory of modern flora observed in the Tipperary Creek valley.

The modern mammalian population is markedly different from that which inhabited the Tipperary Creek area until recent prehistoric times. Beck (1958) provides a comprehensive list of mammalian species which presently inhabit or have formerly inhabited the general region around the study area. The predominant species was, of course, the bison. Elk, mule deer and pronghorn antelope were also common. The most abundant carnivores included wolf, swift fox, grizzly bear, and mountain lion. Today the only large mammal which can still be observed in the creek valley is the white-tailed deer. Carnivorous mammals are represented by coyote, skunk, badger, red fox, raccoon, river otter, mink and weasel. The jack rabbit and snow shoe hare are abundant as well as many other rodents such as the least chipmunk, Franklin's ground squirrel, northern pocket gopher, beaver, muskrat and a variety of mice and voles.

Also inhabiting the creek valley is a widely varying and abundant bird population. Waterfowl, birds of prey and song birds all reside in the study area. Some of the species which excavators observe daily at the site are the great blue heron, pelican, red-tailed hawk, great horned owl, a variety of ducks

and geese during migratory periods, crow, ruffed grouse, sparrow, black bird and magpies. For a list of faunal resources in the study area see Walker (1983).

3.0 PREHISTORY OF THE RESEARCH AREA

3.1 Late Glacial History

It is possible to estimate when the Amisk site area became habitable by examining the late glacial history in the region. The post-glacial establishment of terrestrial biota required not only the retreat of the Laurentide ice-sheet, but also the dispersal of Glacial Lake Saskatoon under which the Tipperary Creek area was submerged following deglaciation. According to Christiansen (1970) the Laurentide ice-sheet retreated, during the terminal Wisconsinan, to the northeast away from the Saskatoon area about 12,000 years ago. Meltwater from the glacier created Lake Saskatoon which prevented the exposure of dry land in the Amisk site area. As the ice-sheet continued to retreat to the northeast Glacial Lake Saskatoon began to drain through the Watrous Spillway in the same direction. As the water level dropped the drainage became restricted to a channel which forms the present day South Saskatchewan River valley. Approximately 10,000 years ago the water level had dropped enough to expose dry land. This exposure is indicated by evidence of aeolian processes in post glacial deposits. Christiansen (1970) cites the occurrence of wind-blown silts dating to 9940 +/- 160 years B.P. at Beaver Creek and on the Saskatoon Terrace at a more recent age of 8160 +/- 125 years ago. Given this situation

the earliest possible arrival of terrestrial flora and fauna, including human occupation, in the immediate Saskatoon area was between 10,000 and 8,000 years ago. The culture history of this area is then most likely to have begun during the Early Plains Indian Period based on Dyck's (1983) chronology.

The oldest cultural tradition known to have existed in Saskatchewan is the Clovis complex. The distinctive lanceolate spear points of these late Pleistocene big game hunters have been found at a number of locations in Saskatchewan but unfortunately these are only surface finds. The Clovis complex is widespread in North America with sites dating between 11,300 B.P. and 10,500 B.P.. A Pleistocene fauna of mammoth, camel, horse and bison is commonly found associated with Clovis points. The following cultural chronology is largely based on Dyck (1983). The cultural chronology of southern Saskatchewan is quite well known as a broad outline. However, more research is required to add detail and fill gaps in this chronology. Many of the cultural complexes mentioned in the following section are known from surface finds only and not from intact components. Before the exact nature of culture change in this part of the world will be understood, it is essential that all cultural complexes are identified as a part of a complete, in situ assemblage. Until that time much of what follows is merely a list of complexes whose interrelationships are only poorly understood at best.

3.2 The Early Plains Indian Period

As described by Dyck (1983), the Early Plains Indian Period spans a 2,700 year period from 10,500 B.P. to 7,800 B.P.. The beginning of this period was a time of climatic change. During the glacial maximum continental ice created a barrier which prevented the north-south movement of air masses. Due to melting of the Laurentide ice-sheet, a corridor was formed in the continental glacier which allowed the influx of cold Arctic air to the south. This cooler climatic regime is referred to as the Preboreal and lasted from about 10,500 B.P. to 9,650 B.P.. The Preboreal saw the northward spread of grassland vegetation into southern Saskatchewan bringing with it the bison which would be the dominant animal species in this area until the historic period. Following the Preboreal, from 9,650 B.P. to 8,450 B.P., came a period of warmer summers and cold winters referred to as the Boreal. This regime was characterized by a continued northward migration of the grasslands. Finally, near the end of the Early Plains Indian Period came the beginning of a long, warm episode known as the Atlantic. During this time of warmer summers, between 8,450 years ago and 4,680 years ago, the grasslands reached their maximum extent northward and eastward.

Based on spear point typologies, Dyck (1983) recognizes three Early Plains Indian Period cultural traditions. 1) The Lanceolate Fluted or Basally Thinned Tradition; 2) The Lanceolate Straight or Rounded Base Tradition; and 3) The

Lanceolate Stemmed Tradition. All are represented by surface finds and not excavated sites in Saskatchewan with the exception of the Niska site near Ponteix (Meyer 1986) which revealed an intact Cody complex assemblage.

3.2.1 The Lanceolate Fluted or Basally-Thinned Tradition.

Archaeological evidence of this tradition, which includes the Folsom/Midland and Plainview point types, is restricted to surface finds in Saskatchewan. The Folsom complex represents the earliest appearance of a Plains bison hunting strategy (Dyck 1983). Although remains of mammoth, mountain sheep, deer, marmots and rabbits have been found associated with Folsom points, the bison is by far the most common species represented in Folsom sites. The Folsom complex is easily recognized by a distinctive stone flaking process and the finely made, fluted projectile points which are a product of this process (Frison 1978). The tool kit includes, apart from the fluted points, endscrapers, sidescrapers, bifacial cutting tools, drills, graters, choppers and hammers. Bone awls and needles, knives and fleshers have also been found in Folsom sites. The Midland point type has also been found in Folsom levels and is believed to represent an unfluted Folsom point (Frison 1978).

Folsom sites are distributed across the High Plains of North America. There are excavated sites in Wyoming, Colorado, Texas and Montana that are dated from 10,900 years

ago to 9,900 years ago. The most common types of sites are camps and bison kills. The bearers of the Folsom cultural tradition were accomplished communal bison hunters. Evidence for the use of jumps and traps for bison procurement has been documented at the Bonfire Shelter and Folsom sites (Frison 1978).

Plainview projectile points are best known from the Southern Plains (Frison 1978). These are large lanceolate spearpoints with concave bases. There have been a number of finds on the Northern Plains that are reminiscent of this type.

3.2.2 The Lanceolate Straight or Rounded-Base Tradition.

This tradition includes what may be two phases of a single complex or two separate but closely related complexes. These are represented by the Agate Basin and Hell Gap projectile point types. Sites bearing these points overlap in time with one another as well as sites of the Folsom complex. Dates from Agate Basin sites range from 10,500 B.P. to 9,400 B.P.. Hell Gap sites are dated between 10,240 years ago and 9,600 years ago (Dyck 1983). The Agate Basin point displays a smooth, lanceolate outline with a straight or slightly rounded basal edge. They are lenticular in longitudinal cross section and transverse cross section and usually have delicately retouched edges. According to Frison (1978), the Hell Gap point type represents a slight modification of the Agate Basin

type to promote more secure hafting. The Hell Gap point is lanceolate with a constriction of the edges along the lower one third of the body. Above this constriction the body widens to produce a slight shoulder. This tapered base and slight shoulder are thought to have enhanced the quality of the haft.

There is one surface site and fifteen find spots of points of this tradition in Saskatchewan. Evidence from excavated sites in Wyoming (Frison 1978) suggest that the people of this tradition were communal bison hunters. At the Agate Basin and Casper sites, natural landforms were employed as traps in which mass kills of bison took place. The tool kit of these hunters is typical of the Plains bison hunting strategy. It includes stone scrapers and bifacial cutting tools, end scrapers, retouched flake and blade tools.

3.2.3 The Lanceolate Stemmed Tradition. This tradition is dated between 10,150 B.P. and 8,600 B.P. thus overlapping in time with the other two Early Plains Indian traditions (Dyck 1983). A number of lanceolate projectile point types belong to this tradition including the stemmed Firstview and Alberta points, the unstemmed Milnesand point and the stemmed Scottsbluff and Eden points of the Cody complex. Unfortunately only surface finds of artifacts of the Lanceolate Stemmed tradition have been found in Saskatchewan with the exception of recent work at the Niska site near Ponteix (Meyer 1986). Of particular interest here is the

discovery of a Cody knife, a stemmed, bifacially worked, cutting tool distinctive of the Cody complex, in a cultivated field approximately 1.5 kilometers north of the Amisk site area (Walker personal communication). Evidence from excavated sites outside of Saskatchewan indicate that the bearers of this tradition were bison hunters.

Frison (1978) cites evidence of bison procurement techniques such as jumps and traps in natural landforms being used by people of the Alberta and Cody complexes at sites in Wyoming and Nebraska. Alberta points have been found in levels dating from 9,500 to 9,000 years old. They have wide lanceolate bodies with true, parallel sided stems. The younger Cody complex is dated between 8,800 and 8,400 B.P.. Included in this complex are the Scottsbluff points with their wide triangular outlines and straight to expanding stems and the long narrow Eden points also with straight or expanding stems and a diamond shaped cross section.

3.2.4 Lanceolate Forms of the Late Early Plains Indian Period.

Dyck (1983) suggests that there are four projectile point types dating from 9,200 years ago to 8,000 years ago that represent a continuation of the Lanceolate Fluted or Basally Thinned tradition. These include Fredrick, Lusk, Angostura and Browns Valley. All are lanceolate points exhibiting slightly concave bases. Frison (1978) describes these as parallel-oblique flaked projectile points due to the

distinctive pattern of flake scars left by the manufacturing process. Frison includes the Pryor Stemmed complex in this group. Points of this complex have been found in sites dating between 7,500 and 8,500 years ago. The Fredrick complex is dated between 8,400 B.P. and 8,000 B.P. and is seen by Frison as a significant change in projectile point morphology following the Cody complex at a number of sites in Wyoming. The loss of the shoulder and stem as compared with Eden and Scottsbluff points accounts for their apparent similarity with older lanceolate types. The Lusk complex is described as a degeneration of the Fredrick point type. Dated at about 7,900 years B.P., Frison considers these to represent poorly made Fredrick points. He believes that other parallel-oblique flaked projectile points such as Angostura may actually be local variants on a Fredrick/Lusk theme.

3.3 The Middle Plains Indian Period

The Middle Plains Indian Period is a continuation of the Plains bison hunting strategy from the Early Plains Indian Period. The tool kit remained similar with one exception that is the hallmark of this period. This is the replacement of lanceolate spear points with side-notched atlatl dart tips. No dramatic shift in climate is associated with the transition between these two periods. The Atlantic climatic regime, which began at about 8,450 B.P., had been established for approximately 750 years by the beginning of the Middle Plains Indian Period about 7,700 years ago. This warm, dry climate

continued until 4,700 B.P. when the cooler, moister Sub-Boreal climate, which is similar to the modern climate in the Saskatoon area, saw the southward and westward retreat of the grasslands and an expansion of the boreal forest to the south. This climatic regime lasted 1,800 years when the even moister Sub-Atlantic climate with its cool, cloudy summers and stormy winters took over and continued after the end of the Middle Plains Indian Period which came about 1,850 years B.P..

3.3.1 The Mummy Cave Series. The earliest cultural tradition of the Middle Plains Indian Period is referred to, by Dyck (1983), as the Mummy Cave series. Walker (1980) proposes that there is a succession of five types of side-notched points in this series. These are 1) Blackwater Side-Notched 7,600 - 7,200 B.P.; 2) Northern Side-Notched 7,100 B.P.; 3) Hawken Side-Notched 6,400 B.P.; 4) Gowen Side-Notched 5,900 B.P.; and 5) Mount Albion Corner-Notched 5,700 B.P..

Some authorities have suggested that there may have been a slight shift from the big-game hunting strategy toward a hunting/gathering type strategy during these times. Although these people continued to hunt bison as their main food source, the marginal nature of the warm, dry Atlantic climate may have had some effect on their subsistence strategies. Walker (1980) suggests that hunting of smaller herds of bison was concentrated around the rivers and lakes. A broadening of the subsistence base to include small mammals and possibly

more plant foods is also suggested (Schmits 1978). Further south, at the Hawken site in Wyoming, Frison (1978) documents the continued use of trapping in natural landforms as a means of bison procurement.

The Gowen I and II sites within Saskatoon are the only excavated Mummy Cave occupations in Saskatchewan (Walker 1980). The lowest levels of the Long Creek and Oxbow Dam sites may, however, also represent latest Mummy Cave occupations (Dyck 1983).

3.3.2 The Oxbow Complex. The Oxbow complex, which is dated between 4,700 B.P. and 3,050 B.P., was first defined in Saskatchewan and is represented in many excavated sites in this province. This complex is considered to have developed directly from the preceding Mummy Cave assemblage (Walker 1980; Frison 1978). The tool kit remains relatively unchanged except for the distinctive Oxbow projectile point. The Oxbow point is generally triangular in outline with the wide, "U-shaped" side-notches occurring at its widest point. The base is thinned and usually concave. There have been camp sites and burial sites excavated in Saskatchewan but there has yet to be an Oxbow bison kill site discovered. The abundance of bison bone found in habitation sites, however, indicates that bison hunting was the mainstay of the bearers of the Oxbow complex.

The chipped stone industry of the Oxbow complex is

generally based on local materials (Dyck 1983). The tool assemblage from these sites includes triangular end scrapers, side scrapers, ovoid, bifacially worked cutting tools and unnotched, triangular projectile points which may represent an intermediate stage of manufacture of the Oxbow point (Dyck 1977). Bone awls, scrapers and beads, pendants made of clam shells and some copper artifacts have also been found. Sites in the Saskatoon area with Oxbow components include the Harder site and the Moon Lake site (Dyck 1983).

3.3.3 The McKean/Duncan/Hanna Complex. Appearing later in Saskatchewan, but entirely overlapping in time with the Oxbow complex is the McKean/Duncan/Hanna complex. Radiocarbon dates from sites in Saskatchewan indicate that this complex existed between 4,150 B.P. and 3,100 B.P. (Dyck 1983). McKean, Duncan, and Hanna are the names given to the projectile point types characteristic of this complex. The McKean point is a small to medium sized lanceolate point with a concave base and no side-notches. The Duncan point is a medium sized lanceolate point with a straight or flared stem and a slight shoulder. The Hanna point is a small to medium sized lanceolate point with broad side-notches, a flared base and distinct shoulders. According to Dyck (1983), the McKean point is often missing from assemblages in Saskatchewan. Sites with McKean/Duncan/Hanna complex components in Saskatchewan include Mortlach (Wettlaufer 1955) and the Sjøvold site near Outlook (Dyck 1980).

The relationship of the McKean/Duncan/Hanna complex to the Oxbow complex in Saskatchewan is a subject of debate. Some see a direct evolutionary relationship with McKean/Duncan/Hanna developing out of Oxbow roots (Reeves 1969). Others suggest that the appearance of the McKean complex represents the arrival of a new cultural group on the Plains which moved in from the west or south after the worst of the Atlantic drought was over (Brumley 1975; Dyck 1983). The occurrence of grinding stones in McKean sites in the south indicates that big-game hunting was supplemented by a greater reliance on gathered plant foods by these people (Frison 1978). In Saskatchewan, however, it appears that the Plains bison hunting strategy similar to that of earlier inhabitants was employed. This is reflected in the tool assemblage which, apart from projectile points, remained essentially the same.

3.3.4 The Pelican Lake Complex. Following the McKean/Duncan/Hanna complex is another bison hunting complex which is wide-spread on the Plains. This is the Pelican Lake complex which was first defined at the Mortlach site in southern Saskatchewan (Wettlaufer 1955). Reeves (1983) suggests that the Pelican Lake complex or phase in his terminology, may have developed from the Hanna component of the McKean complex in a transition which occurred between 3,300 years ago and 2,750 years ago. Dyck (1983) maintains that whether Pelican Lake evolved in situ from McKean/Duncan/Hanna or was introduced from outside the Northern Plains is a problem which remains unsolved. The

Pelican Lake complex is recognized by a small to medium sized, corner-notched projectile point. These points have a triangular outline and a straight to convex base. The corner notches give the shoulders their distinctive "tang" or barb. Dyck (1983) has suggested that the smaller Pelican Lake points may be arrow points rather than atlatl dart tips which would indicate an earlier arrival on the Plains of the bow than is presently accepted.

The Pelican Lake complex is distributed over the entire Northern Plains area and into adjacent geographical regions as well. Evidence of Pelican Lake occupations have been found as far east as the Manitoba Woodlands, as far west as the Rocky Mountains, as far north as the Parkland and south into the Central Plains. Sites in Saskatchewan with Pelican Lake components include Sjøvold (Dyck 1980), Bracken Cairn (Pendree 1980), Mortlach (Wettlaufer 1955), Long Creek (Wettlaufer and Mayer-Oakes 1960), and Walter Felt (Kehoe 1974). Camp sites, a bison pound, and human burials are represented.

In Saskatchewan, the Pelican Lake complex retained the bison hunting strategy of their predecessors. Evidence of bison jumps, traps and pounds which were used repeatedly may indicate that communal bison hunting had attained a very high efficiency by this time. Further south a hunting and gathering strategy is indicated by the occurrence of a wide variety of species in excavated sites as well as the presence of grinding stones for the processing of vegetable foods

(Reeves 1983). The tool assemblage of the Pelican Lake complex is similar to that of previous hunting groups. Chipped stone tools include endscrapers, ovoid bifacial cutting tools, sidescrapers, and drills. Bone awls, shell beads and gorgets, and tooth and claw pendants have also been found.

The Pelican Lake complex persisted on the Plains until about 1850 B.P. (Dyck 1983). In the mountains to the west it seems to have continued a few centuries longer to approximately 1,400 B.P. (Reeves 1983).

3.3.5 The Un-named Complex. Occurring within the time of the Pelican Lake complex is what Dyck (1983) has called the Un-named complex. Recognized by a medium sized, lanceolate, side-notched projectile point with a straight base, the Un-named complex has been dated at about 2,500 B.P. Sites in which these points have been found include the Sjøvold site near Outlook (Dyck 1980), the Head-Smashed-In site in Alberta (Reeves 1978) and the Rocky Island site in Saskatoon (Walker 1983). One bison kill site and two habitation sites are represented. Surface finds of this complex are not reported because of the similarity of projectile points to later forms. Presently, they can only be distinguished by association with a radiocarbon date. It has been suggested that the Un-named complex represents an early stage of the Besant complex (Reeves 1978). Similarity to Early Woodland projectile points indicates a possible eastern

origin for this complex (Dyck 1983).

3.3.6 The Sandy Creek Complex. An identification problem similar to that of the Un-named complex is found in what Dyck (1983) refers to as the Sandy Creek complex. The diagnostic projectile points are side-notched, basally indented and virtually indistinguishable from Oxbow points. For this reason Sandy Creek points are only recognized when associated with radiocarbon dates. Presently they are found to occur between 2,450 years ago and 1,950 years ago (Dyck 1983). The Sandy Creek complex is, therefore, apparently temporally segregated from the Oxbow complex which is known to occur between 4,700 B.P. and 3,050 B.P.. Sandy Creek components have been found at the Sjøvold site (Dyck 1980), the Mortlach site (Wettlaufer 1955), and the Walter Felt site (Kehoe 1974) in Saskatchewan.

3.4 The Late Plains Indian Period

The beginning of the Late Plains Indian Period is marked by the addition of two new elements to the cultural assemblage of the Plains bison hunters. These are ceramics and the bow and arrow. Dyck (1983) places the beginning of this period to coincide with the first appearance of the Besant complex at about 2,000 years ago. This boundary between preceramic and ceramic using cultures is not marked by any significant climatic changes but rather occurs midway through the cool, moist Sub-Atlantic which continued until about 1,690 B.P..

Following this came a warmer, drier period, the Scandic, which lasted until 1,000 years ago. The warmer, moister Neo-Atlantic then took over until the onset of the, again, drier Pacific climate at 760 B.P.. A cooling trend accompanied by an increase in precipitation called the Neo-Boreal followed from 410 B.P. to 115 B.P. at which time the modern warmer, drier climatic regime took over.

3.4.1 The Besant Complex. According to Dyck (1983) the first appearance of the Besant complex took place at about 2,000 B.P. and lasted for about 850 years. First recognized at the Mortlach site in southeastern Saskatchewan, this complex is considered by some (Frison 1978) to represent a cultural climax as far as sophisticated and effective bison procurement techniques are concerned. Although bison jumps were still employed at this time, these people were masters at pound making and at using these pounds to trap and kill bison. Frison believes that their ability to build pounds lessened their reliance on natural jumps and traps thus allowing them a greater freedom in choosing hunting locations. The Besant complex is credited with the use of a number of other structures. These include the tipi, houses built on frames of posts that were sunk into the ground and possible ceremonial structures which were built adjacent to the bison pounds. These people were also responsible for the earliest use of burial mounds on the Northern Plains, a trait which is reminiscent of the Early and Middle Woodland traditions in the east (Dyck 1983).

The Besant complex (or the contemporaneous Avonlea complex which is discussed below) also marks the arrival of the bow on the Plains. Reeves (1983) suggests that the transition from the atlatl to the bow occurred between 1,600 B.P. and 1,250 B.P.. He believes that the lanceolate, broadly side-notched, straight based Besant points represent atlatl dart tips while the smaller Sammantha Side-Notched point is the corresponding arrow tip. The Besant and/or the Avonlea people are credited with introducing pottery to the Northern Plains as well. Dyck (1983) describes these pots as being generally conoidal in shape, with smooth or cord marked surfaces, often decorated with a single row of punctations parallel to the rim and tempered with sand and grit. The remainder of the tool kit is typical of the Northern Plains with ovoid, bifacial cutting tools, drills, endscrapers and sidescrapers. Reeves writes that a preference was shown for the use of Knife River Flint in tool making (Reeves 1983).

3.4.2 The Avonlea Complex. As mentioned above, sharing the Northern Plains with the Besant people was another, possibly distinct group of bison hunters represented by the Avonlea complex. Appearing 250 years later than the Besant complex, the Avonlea complex existed until about 1,150 B.P. as did the Besant (Dyck 1983). Reeves suggests that Avonlea is an in_situ development out of Pelican Lake on the Northern Plains which occurred between 1,850 and 1,750 years ago. By contrast, Besant is seen as intrusive from the

Eastern Woodlands. At present, however, the precise nature of the relationship between these two complexes is unknown (Dyck 1983).

The Avonlea people are also credited, by some authors, with the introduction of the bow and arrow to the Northern Plains. They appear to have exclusively used arrow points. They are thin, triangular points with small, shallow side-notches near the base. The base is generally slightly concave. Avonlea has, as well, been considered responsible for the first appearance of pottery in this area. Dyck sees three types of pots distinguished by surface finish. While all are generally conoidal in shape, some display net a impressed finish, others a spirally channeled finish and the rest a smooth finish. Decoration, when present, consists of a row of punctates or horizontal incisions parallel to the rim. The remaining tool kit is similar to other Plains bison hunting complexes. It differs from Besant in that local, rather than exotic, materials are most commonly represented.

3.4.3 The Late Side-Notched Series. Bison hunting continued to the end of prehistory and into the historic period on the Northern Plains and the bow and ceramic pottery remained as important tools in this subsistence strategy. Appearing at 1,200-1,150 B.P. was a point style known as Prairie Side-Notched. This is a triangular point with notches very close to or touching the basal edge. Some authors (e.g. Dyck 1983) see similarities between this type and projectile

points of the Middle and Late Woodland traditions to the southeast. Others consider the Prairie Side-Notched type to be a direct development out of earlier Besant and Avonlea types.

There is a decline in the occurrence of Prairie Side-Notched points at about 700 B.P. The Plains Side-Notched type began to appear along with Prairie Side-Notched points at 550 B.P. and soon replaced them entirely. These points show a finer degree of workmanship and the notches are well removed from the base.

Ceramics from this time show variation in form from simple conoidal shapes to composite silhouettes. An even greater diversity is seen in types of surface finish and decoration. The balance of the tool kit includes stone knives and scrapers reminiscent of earlier Plains bison hunters.

The arrival of the horse and gun, soon followed by European traders and their diseases which decimated the aboriginal populations of the Northern Plains, marks the end of prehistoric time in the study area. Dyck (1983) places the boundary between history and prehistory in southern Saskatchewan at A.D. 1790.

4.0 RESEARCH DESIGN AND METHODOLOGY

4.1 Site Discovery and Mapping

The Amisk site in the Tipperary Creek valley was discovered in 1982. As a part of the Tipperary Creek Project, which was an archaeological resource assessment of the Wanuskewin Heritage Park carried out by Dr. E.G. Walker in the summer of 1982 for the Meewasin Valley Authority, a series of small backhoe trenches were dug at various locations in the creek valley. These locations were intuitively derived and were all immediately adjacent to the creek channel or a meander scar to provide maximum exposure of the stratigraphic section. All of the trenches revealed stratified occupations. The Amisk site was no exception. A trench approximately 3 meters long and 1.5 meters deep was dug on the north side of the spur in which the Amisk site is buried. Fractured bone, chipped stone and fire cracked rock were found in the trench. It was originally thought that two distinct occupations were represented at this site (Walker, 1983).

In early May, 1984 a detailed topographic survey of the study area was done. This survey provided the basis for the construction of large scale contour maps of the Amisk site such as Figure 2. At the same time the site area was divided

into a 10 meter grid with each grid intersection marked by an 30 cm metal pin. The elevation of each pin is known relative to a bench mark established at an old barn foundation just to the west of the Amisk site area. This bench mark was set relative to a legal bench mark located on a railroad right-of-way approximately 2 kilometers to the northwest. The grid was used to position excavation units according to the grid origin which is an arbitrarily established point located at the Newo Asiniak site immediately to the north of the Amisk site area. Excavation units are described by the relationship of their northwest corners to the grid and stated in meters south and east or west of the origin. The grid also provided a basis for controlled vertical provenience as each pin has a known elevation.

4.2 Aims and Objectives

The goal of this excavation was to provide data necessary for meeting the research objectives of this project. These include determining the contents of the site; the areal extent of the site; the vertical extent of the site; the number of distinct cultural layers; the age of these layers; and the structure of contents within each of these layers. Meeting these objectives was the major factor influencing the excavation techniques employed. Excavations at the Amisk site also represent an opportunity to develop and test methods and techniques for subsequent excavations of larger and more complex sites in the Wanuskewin Heritage Park.

4.3 Excavation Technique

The basic excavation unit is one square meter. In keeping with the objectives outlined above it was decided to place these units in large continuous blocks rather than in a random scatter over the entire site area. This method allows the examination of small scale spatial organization of artifacts and features. Three of these units have been opened at the Amisk site (Figure 2). The largest, Unit A, which includes 12 square meters is located at the north west part of the spur near the margin of an ancient meander scar left by Tipperary Creek. The remaining two, Units B and C, are 5 and 4 square meters respectively. Unit B is located 8 meters east of Unit A near the margin of the meander scar. Unit C is between Units A and B but 7 meters south in a location more central to the site area. These units are connected by one meter wide trenches. The purpose of these trenches was to establish continuity of cultural layers across a portion of the site area; to examine changes in structure of each layer in this area; and to provide a continuous stratigraphic section of the excavations. These trenches account for 15 square meters of the total 42 square meters excavated. Two test units of 2 square meters each were also excavated. Test Unit 1 is located at the eastern extremity of the spur near the modern creek channel. Test Unit 2 is at the southern edge of the landform again near the modern creek channel. The purpose of these units was to establish the stratigraphic

continuity to the extent of the site area.

The trenches were dug entirely by shovel one square meter at a time. The meter square was divided into four 50 cm quadrants. The unit was shovel-shaved according to cultural layers which were identified in adjacent excavation units. The fill from each quadrant was screened and the artifacts bagged and labelled according to unit, quadrant and level after the method described by Meyer and Prentice (1983). In this way vertical provenience is preserved and horizontal provenience is accurate to 50 centimeters. Although this technique does not allow mapping or photographing of precise artifact patterning it is suited to the construction of choroplethic or isoplethic maps of densities of types of artifacts such as those presented in this report (e.g. Figures 7 and 8). The use of this method allows a more expedient excavation of units than the precise technique described below. The advantages include an increase in the area exposed as well as an increase in the size of the artifact collection without substantial increases in cost. The disadvantage is the lack of preservation of individual artifact distributions. Features which were considered to be significant were not shovelled out but were left intact for mapping, photographic recording and collection.

The large units at the ends of these trenches account for 21 square meters of the total 42 square meters excavated. Digging was done entirely with small hand tools. Screening of

all fill with 6 mm wire cloth ensured that the smaller artifacts were recovered. Fine screening with a 2 mm mesh was done on a 1 litre sample of fill from each of the cultural levels to test for the presence of micro-flakes, minute bone fragments and other small organic remains. Excavation levels generally corresponded with cultural layers except when these layers were too thick to be exposed in their entirety at one time. In this case the cultural layer was exposed in two and occasionally three arbitrary, 5 cm levels. An attempt was made to leave all of the artifacts exposed in_situ for mapping and photographic recording. As the maps and photographs are to scale it was not practical to leave minute artifacts intact. It has been estimated that artifacts smaller than one centimeter in their largest dimension would be hardly visible on the photographs taken. For this reason artifacts in this size category were removed from the unit as they were discovered and included with those artifacts recovered from the screen. Exceptions to this are artifacts which were considered to be highly significant such as projectile point fragments or pot sherds that have diagnostic qualities, lithic fragments of rare types and occurrences of small artifacts in feature-like concentrations which as a whole are mappable.

This precise approach to excavation has been adopted to allow the recording of exact, individual artifact positioning which is essential to the examination of the structural relationships among artifacts and features. Two recording

methods were employed. First, a record of each excavated level was made by the excavator drawing a detailed map on a prepared level form. These level forms have been compiled to construct the level plans in this report (e.g. Figure 4 and 5). From these forms horizontal provenience of each artifact was measured relative to the southeast corner of each unit. Controlled vertical provenience was recorded by direct measurement of the depth of each artifact relative to the northwest corner of the unit. The northwest corner of the unit was used as the datum due to the slope of the landform in which the Amisk site is located. The northwest corners are consistently at a slightly higher elevation than the others.

Second, a vertical photograph was taken of each exposure of artifacts in each unit. These photographs were used to create a controlled photo mosaic (e.g. Plate 6) and essentially provide a photo-map of each level without having to expose broad areas simultaneously. The photographs were taken on 120mm black and white film (ASA 125) with a Yashica Mat 124G twin lens camera using an 80mm lens. The camera was placed above the centre of the unit atop a 2.5 meter tripod which has a 65 cm "boom" that permits the extension of the camera away from the tripod there by keeping the legs of the tripod from obstructing the photograph. The camera was carefully levelled and aligned with the unit. Two or three bracketted exposures were made to ensure a good photograph of each level of each unit. A canopy was erected to place the unit being photographed in the shade eliminating the harsh

lighting and shadows created by direct sunlight. To ensure even lighting without shadows which may hide some of the artifacts, two electronic flashes were placed on opposite sides of the unit or one flash was placed directly above the unit. Aside from photomapping, two color slide photographs were taken of each excavated level.

After all photographic recording, mapping, and measuring was complete each artifact was given a unique field specification number and placed in an appropriately labelled bag for transport to the laboratory where cataloguing and analyses were done. This meticulous excavation technique makes complete site reconstruction possible whether it be photographic, by illustration or physically placing the artifacts in their original configuration.

4.4 Catalogue, Inventory and Artifact Analysis

Laboratory space for the cataloguing, analysis and conservation of artifacts recovered from the Amisk site was provided by the Department of Anthropology and Archaeology at the University of Saskatchewan, Saskatoon. The first step in laboratory treatment of the artifacts was careful washing in clear water after which they were laid on tables to dry. The artifact inventory and catalogue was maintained using a computer data base management system. As many as thirteen attributes of each artifact were entered and saved in files according to level. These attributes include: catalogue

number; excavation unit; cultural level; field specification number; X,Y,Z provenience; artifact category e.g. lithic, faunal, ceramic, metal, organic; material type; form; species where applicable; anatomical part where applicable; cultural affiliation where applicable; weight; and quantity. Most of the quantitative analyses and some of the qualitative analyses of artifacts from the Amisk site were accomplished with the help of the computer data base management system.

After artifacts were catalogued and properly numbered they were bagged according to unit and level and placed in storage boxes by units. Space for curation of artifacts recovered from the Amisk site is presently provided by the Department of Anthropology and Archaeology at the University of Saskatchewan.

4.5 1984 Field Season

Excavations began on May 14, 1984 based on the assumption that the Amisk site had one or two cultural components buried at a maximum depth of 50 centimeters. For this reason a one meter square was considered to be the most practical size for each excavation unit. Each of the four excavators was assigned a single unit. It was soon discovered that the Amisk site was more deeply stratified and much more deeply buried. With 7 identified cultural levels buried at depths up to 210 cm it became apparent that the excavation of one square meter at a time was impractical. Refinements in excavation technique to

accomodate these conditions were implemented in the 1985 field season and will be discussed below.

As a result of newly discovered nature of the Amisk site the areal extent of excavations in the 1984 field season were limited and attention was given to establishing the vertical extent of the site and to refining its cultural stratigraphy. Ten square meter units were opened. Five were completed, three were almost completed and two were left still requiring a great deal of work.

4.6 1985 Field Season

In 1985 a greater emphasis was placed on expanding the areal extent of excavations. This was accomplished by changes in excavation technique to suit the multi-component, deeply buried nature of the Amisk site and by an increase in the number of excavators. Rather than using the one meter square as the basic excavation unit and, assigning it to one excavator, larger units were opened and excavated by teams of excavators who completed all the square meters in the unit at a given level before proceeding to the next level. This created a larger, more level work space for the excavators. These changes resulted in a significant increase in productivity. All of the units opened in the 1984 field season were completed and an additional 32 square meter units were opened and completed between May 1 and August 30 with the addition of only one crew member to the team of 5 excavators.

Among these 32 units were 15 meters of trench which were excavated, using the quadrant method described earlier, by two excavators over a two month period. Two additional units on the east side of Unit A were excavated using this method to expose a rock feature in cultural level 2. The remaining excavators continued using precise excavation techniques to complete 15 units. The use of power screens provided by the University of Saskatchewan greatly enhanced the efficiency of excavations during the 1985 field season.

At the completion of excavations at the Amisk site details of the stratigraphy were drawn and photographed (Figure 3, Plate 4) before being covered for the winter. The Amisk site excavations are slated to be backfilled in 1986 after specialists from other disciplines have had an opportunity to take samples.

5.0 STRATIGRAPHY OF THE AMISK SITE

5.1 Sedimentary Stratigraphy

The study of sedimentary stratigraphy can reveal much about ancient environments and how they have changed through time. This is accomplished by the examination of biological remains incased in sedimentary deposits and the examination of the physical properties of the deposits themselves. These physical properties are sedimentary structures and the attributes of individual sedimentary particles (Selley 1976). This section will discuss the physical properties of the sedimentary deposits at the Amisk site. Most of the biological remains in these deposits are also archaeological remains which will be discussed in subsequent sections.

The degree of sorting by grain size, the roundness of the grains and the size of individual sedimentary grains are indicative of the energy of the transport and depositional media to which the grains were subject. This, in turn, can provide clues as to the nature of the environment in which they were deposited (Laporte 1979). For example sediments that are coarse-grained, angular, and poorly sorted indicate rapid deposition from fast running water. Conversely, sediments that are fine-grained, well sorted, and finely layered indicate deposition in calm water, where individual

small grains settle slowly from suspension. (Laporte 1979)

The Amisk site is located in a hillwash slope which protrudes as a spur into the Tipperary Creek valley. Hillwash deposits are colluvial in origin, i.e., they are the result of a combination of depositional media including wind, gravity and water in the form of runoff (Acton and Ellis 1978). Although this hillwash slope occupies a location relative to the creek that is similar to the locations of point bar deposits elsewhere in the valley, there are a number of features which distinguish it from point bar deposits. First among these is slope. Whereas point bar deposits are only very gently sloped (Selley 1976), the gradient of the Amisk site is a relatively steep 7.5%. The elevation of the ground surface at the eastern most excavation unit (Test Unit 1) is 2 m less than that of the western most excavation (Excavation Unit A). Second is a lack of characteristic primary sedimentary structures such as cross-bedding which are common to point bar deposits (Selley 1976). Third is the variety of grain sizes, from gravels to clays, that are apparently randomly distributed throughout the vertical section. Point bar deposits are characteristically fine grained sands, silts and clays in a fining upward sequence (Selley 1976). This suggests that the source of sedimentary material for this landform was not the creek but rather the till plain above the valley. The spur has likely been a prominent feature of the valley since early in its history and would only be partially submerged in the highest of flood levels. A scarcity of

overbank deposits in the stratigraphic profile supports this assumption.

A photograph of a small part of the stratigraphic section at the Amisk site is given in Plate 4. Underlying the hillwash slope at the Amisk site is glacial till. All excavation units were dug to this level. Till is recognized by the obvious presence of a boulder pavement intermingled with unsorted gravels, sands, silts and clays. This indicates a late Pleistocene glacial environmental regime at the beginning of the stratigraphic profile. The depth of till below ground surface decreases in a down slope direction, from west to east. In other words, the hillwash overburden is thickest near the valley wall and thinnest near the modern creek channel. Till is buried at 210 cm in Unit A which is the western most excavation. In Test Unit 1, which is the eastern most excavation, till is found at 88 cm (Figure 3). This thinning of the overburden is not the result of the exclusion of certain strata from west to east in the site area but from the thinning of individual strata with distance from the valley wall. The stratigraphic profile remains fairly consistent across the site. The depth of the till level and the thickness of individual strata remain relatively constant in the north-south profile, which represents a transverse section of the hillwash slope.

Immediately overlying the till in the western part of the excavations is a 5 to 25 cm thick homogenous band of very

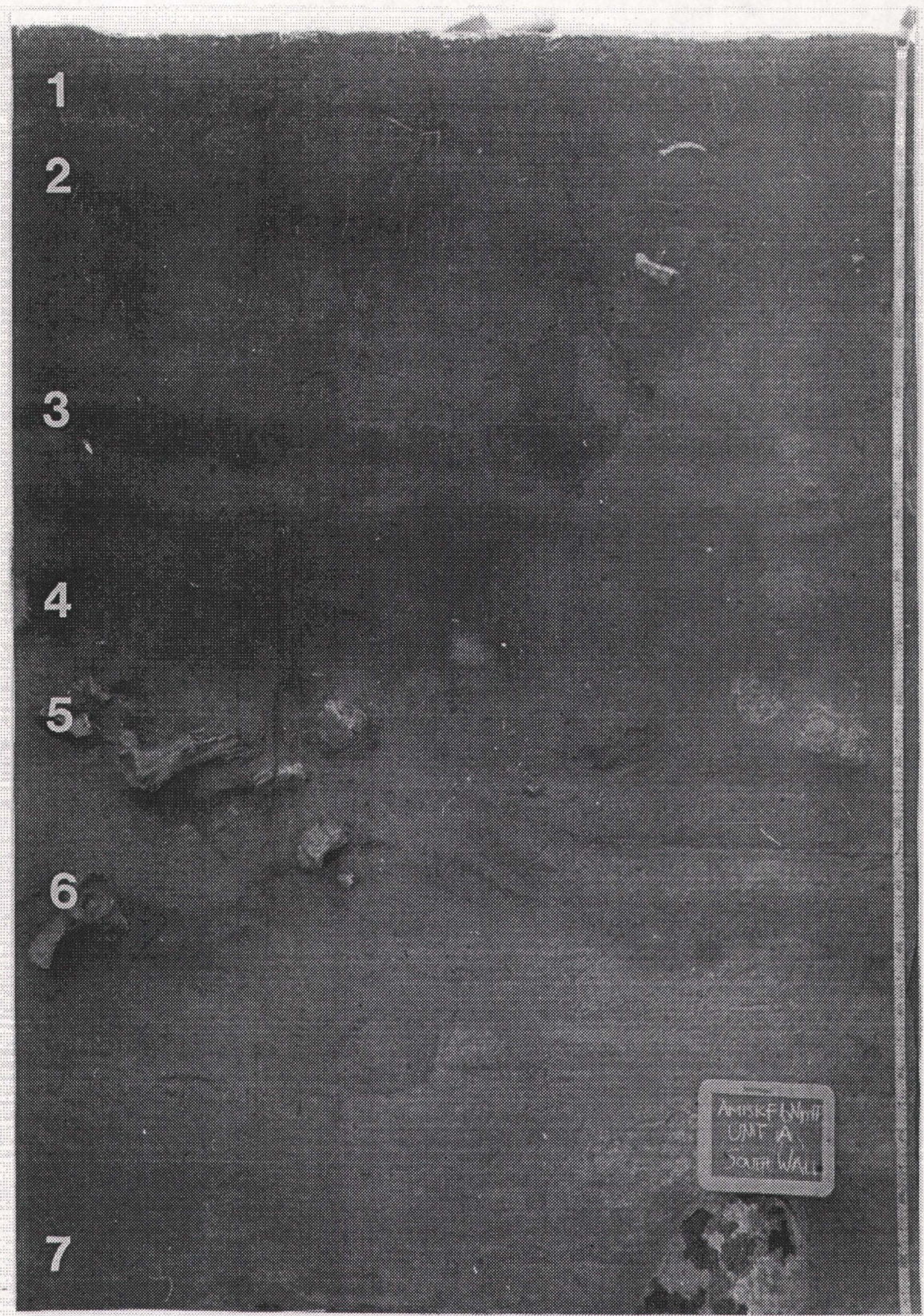


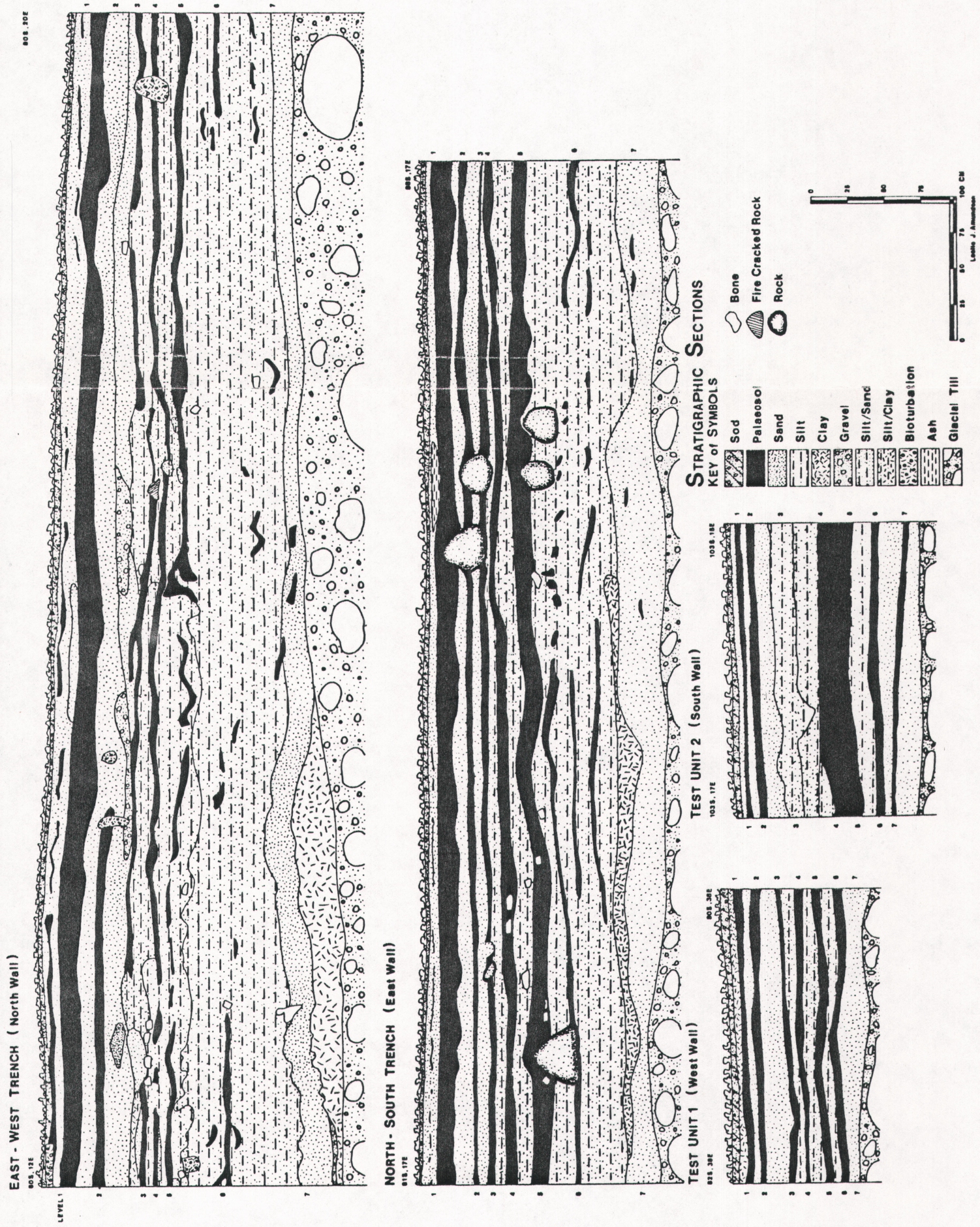
PLATE 4. Stratigraphic section; south wall; excavation unit A

fine, buff colored, dust-like particles which indicate a low energy environment of deposition. This appears to be loess which is an aeolian deposit common in periglacial environments (Leet, Judson, and Kaufman 1978). In other parts of the excavation the till is directly overlain by 15 to 20 cm of coarse yellow sand. Its proximity to glacial till suggests a glacio-lacustrine or glacio-fluvial origin (Acton and Ellis 1978). Cultural level 7, which is the most ancient cultural component at the Amisk site, is located at the top of this sand layer in a intermitant and undulatory dark organic band or paleosol which represents a break in depositional processes to allow soil development.

Above the coarse sand is a very thick (50 to 75 cm) layer of colluvial sands and silts which are light grey in color. These represent the earliest accumulation of hillwash. Cultural level 6 is buried near the top of this stratum. It is associated with an intermitant paleosol. Also associated with level 6 are large boulders (Figure 3). There is no evidence of a natural transport mechanism with the energy to deposit these boulders so it is assumed that they are manuports. A 5 to 10 cm lens of grey clay about 4 m long separates the coarse yellow sands and the light sands and silts in the north-south trench. This suggests deposition from suspension in quiet water and is possibly a remnant of an overbank deposit associated with creek flooding.

Cultural level 5 is accompanied by a 5 to 12 cm thick

FIGURE 3



paleosol which directly overlies the thick sand and silt layer. Above this are 20 to 30 cm of grey colluvial silts and sands, which contain the level 4 and 3 paleosols. Overlying level 3 is a 35 to 50 cm thick layer of brown sand with intermingled lens of gravel and clay indicating a colluvial origin. Cultural levels 2 and 1 are buried in this sandy layer. Capping the stratigraphic section is 5 cm of sod.

A number of depositional regimes have contributed to the formation of the spur in which the Amisk site is buried. At the base are deposits characteristic of a glacial environment. These are followed by periglacial deposits of early post glacial times. On top of this there is the aggradation of hillwash interrupted by occasional flooding and by soil development which provided the ground surfaces on which successive human habitations occurred.

5.2 Cultural Stratigraphy

The Amisk site is a deeply buried, multi-component site with at least seven habitation levels. Plate 5 demonstrates the relative positions of each cultural level. All of these cultural layers are separated by sterile sedimentary strata. The artifact bearing levels are generally associated with distinct dark organic bands or paleosols. In the more ancient levels the paleosols are less distinct, intermittent and undulatory. This is due probably to extended exposure to eluviation processes which remove organic materials from the

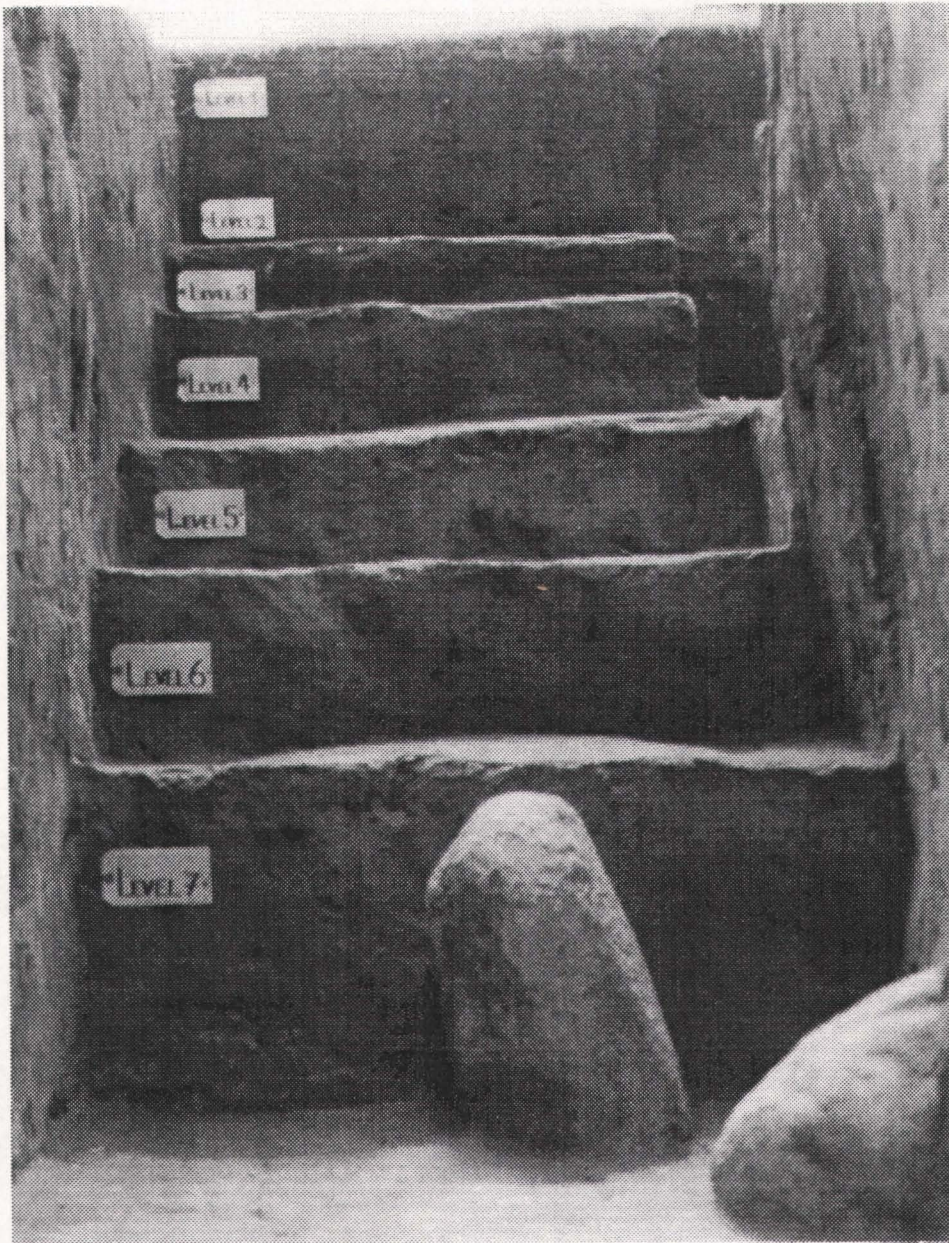


PLATE 5. Cultural / Excavation Levels

sediment (Strahler and Strahler 1979). The association of artifact bearing levels with dark organic bands is assumed to be more than coincidental for two reasons. First, the paleosol represents a period of non-deposition and non-erosion which allowed soil development. This stable period also provided a ground surface suitable for the growth of terrestrial plants and habitation by terrestrial animals and man. Second, human activities would have introduced additional organic material to the sedimentary record. Animal and plant remains, charcoal and ash, and wastes would all contribute to the darkening of the soil on which they lived.

The most ancient cultural level at the Amisk site is level 7. It is associated with a thin, undulatory and intermitant paleosol. Level 7 is buried between 190 cm on the west side of the excavated area and 88 cm on the east side. The sediment texture of this level, compared with Christiansen's (1970) typology, is a sandy clay loam. The relative frequencies of sand, silt and clay upon which these descriptions are based are derived by separation from suspension in water of a sample of the sedimentary matrix of each cultural level. Cultural materials, in the form of lithic debitage and bones, are sparsely scattered throughout the excavated area. A radiocarbon assay of bone collagen yields a age of 5,340 +/- 120 years B.P: 3390 B.C. (S-2768). No culturally diagnostic artifacts have been discovered in level 7.

Cultural level 6 at its deepest in the western part of the excavations is buried at 134 cm. On the east side of the site it is 80 cm below ground surface. Level 6 is coincident with a thin, intermitant paleosol. The sediment texture is a sandy loam. Faunal remains and lithic artifacts are sparsely scattered across the excavated area. No diagnostic artifacts have been found but a bone collagen age of 3,895 +/- 195 years.: 1945 B.C. (S-2534) probably indicates an Oxbow cultural complex occupation.

Level 5 is buried from 95 cm (west) to 70 cm (east) below the surface. It is a 10 to 15 cm thick artifact bearing paleosol. The texture of the sedimentary matrix is described as a loam. It is densely populated with faunal remains and lithic artifacts in a number of apparent clusters. A hearth feature is present in the excavated area. A fragment of an Oxbow projectile point was found in level 5 which is consistent with the radiocarbon assessment of 4,120 +/- 190 years.: 2170 B.C. (S-2535).

Level 4 is a 10 to 15 cm thick paleosol which is found at 80 cm (west) to 55 cm (east) below the ground surface. The sedimentary matrix is a loamy sand. Level 4 artifacts are relatively densely scattered throughout the excavated area. One hearth feature was discovered in this level. A number of Oxbow projectile points were found in level 4 which is radiocarbon dated at 4,015 +/- 195 years.: 2065 B.C. (S-2536).

Level 3 is densely populated with lithic artifacts and faunal remains that are arranged in apparent clusters. A possible pit feature was found in this level. Buried at between 72 cm (west) and 41 cm (east), level 3 is a 10 to 15 cm thick paleosol in a sandy clay loam matrix. No diagnostic artifacts have been found. Bone collagen yielded a radiocarbon age of 3,530 +/- 110.: 1580 B.C. (S-2767).

Artifacts in level 2 are concentrated in the east and south excavation units. Two buried stone circles were partially exposed in this level. Level 2 is found at 40 cm on the west side of the excavated area and at 23 cm on the east in a sandy loam matrix. No diagnostic artifacts were recovered from level 2. A radiocarbon age of 3,055 +/- 70 years.: 1105 B.C. (S-2769) was derived from bone collagen.

Level 1 is a 10 to 20 cm thick artifact bearing layer which required excavation by two or three arbitrary levels. Artifacts are highly fragmented and densely blanketed over the excavated area. A hearth and a bone smashing feature have been exposed in this level. The bottom of this level is at 23 cm on the west side of the excavation and at 12 cm on the east side. The sedimentary matrix is a sandy loam. A number of Plains Side-Notched, Prairie Side-Notched and Avonlea projectile points have been recovered from this level. At least two and as many as three occupations are indicated by these point types and by bone collagen ages of 480 +/- 65 years.: A.D. 1470 (S-2531), and 635 +/- 85 years.: A.D. 1315

(S-2531) and a charcoal age of 905 +/- 155 years.: A.D. 1045

(S-2537).

6.0 CULTURAL MATERIALS OF THE AMISK SITE

Details of areal dimensions of the site as well as vertical and horizontal dimensions; stratigraphic position; nature of the sedimentary matrix; probable age; and general character of each cultural level have been discussed in previous chapters. This chapter will concentrate on the description and analysis of artifactual evidence recovered from each of the levels. This evidence is separated into three broad categories as used by Walker (1980). These are 1) Cultural Assemblage, which includes lithic artifacts, ceramics and bone tools, 2) Faunal Assemblage, which includes all animal remains recovered from the Amisk site, and 3) Features which can be described as patterns of artifacts which are the result of human activity and which incorporate the terrain in their overall form (Linnaeae 1983). Lithic materials in this thesis are referred to by general geological names rather than the "common names" in frequent use in the archaeological community. The reason for this is that specific names such as Knife River flint suggest that the material is known to have been derived from the Knife River. Brown chalcedony, on the other hand, describes the material without suggesting that the author can identify the specific source of the material. One exception to this is the term "Swan River chert" which refers to a specific type of silicified limestone characterized by crystal filled cavities known as vugs. A broad, rather all-inclusive term such as "fine-grained igneous" indicates

that the author does not wish to commit himself to a specific rock name without detailed petrographic analysis.

6.1 Level 1

6.1.1 Cultural Assemblage

Planviews of artifact distributions are given in Figures 4 and 5 and Plate 6.

Lithic Artifacts

Debitage. Three thousand and thirty-one chipped stone artifacts were recovered from level 1 at the Amisk site. Of these 2,981 (98.3%) are debitage. Seven hundred and nineteen items or (23.7%) are flakes. The remaining 2,262 are pieces of nondescript detritus commonly called shatter. Burley and Finnigan (1982) define shatter as lithic debitage which displays no production characteristics. These items are scattered throughout the excavated area and are most densely concentrated at the west side of excavation unit A (Figure 4).

Projectile Points. Fifteen projectile points were discovered during the excavation of level 1 at the Amisk site. One of these is a completely intact Plains Side-Notched type point. There is also a complete Prairie Side-Notched point and an Avonlea point. Another six are broken but are complete enough for type identification. Of these four are Plains

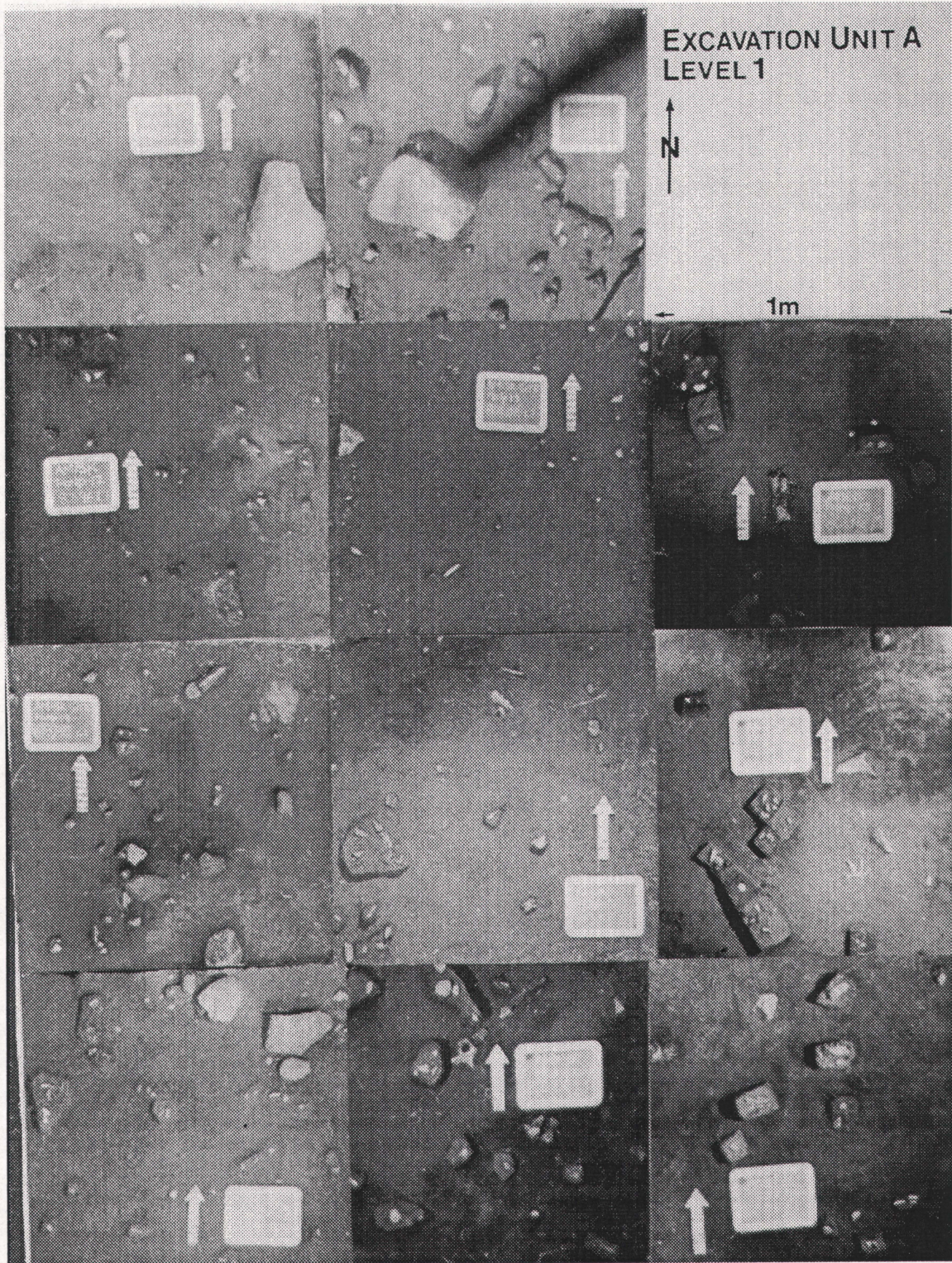


PLATE 6. Example of Photo Map

FIGURE 4

EXCAVATION UNIT 'A' LEVEL 1

- Projectile Point
- Flake
- Debitage
- Silice
- Uniface
- Endscraper
- Hammerstone
- Core
- Fire Cracked Rock
- Rock
- Bone
- Burned Bone
- Teeth
- Shell
- Pottery

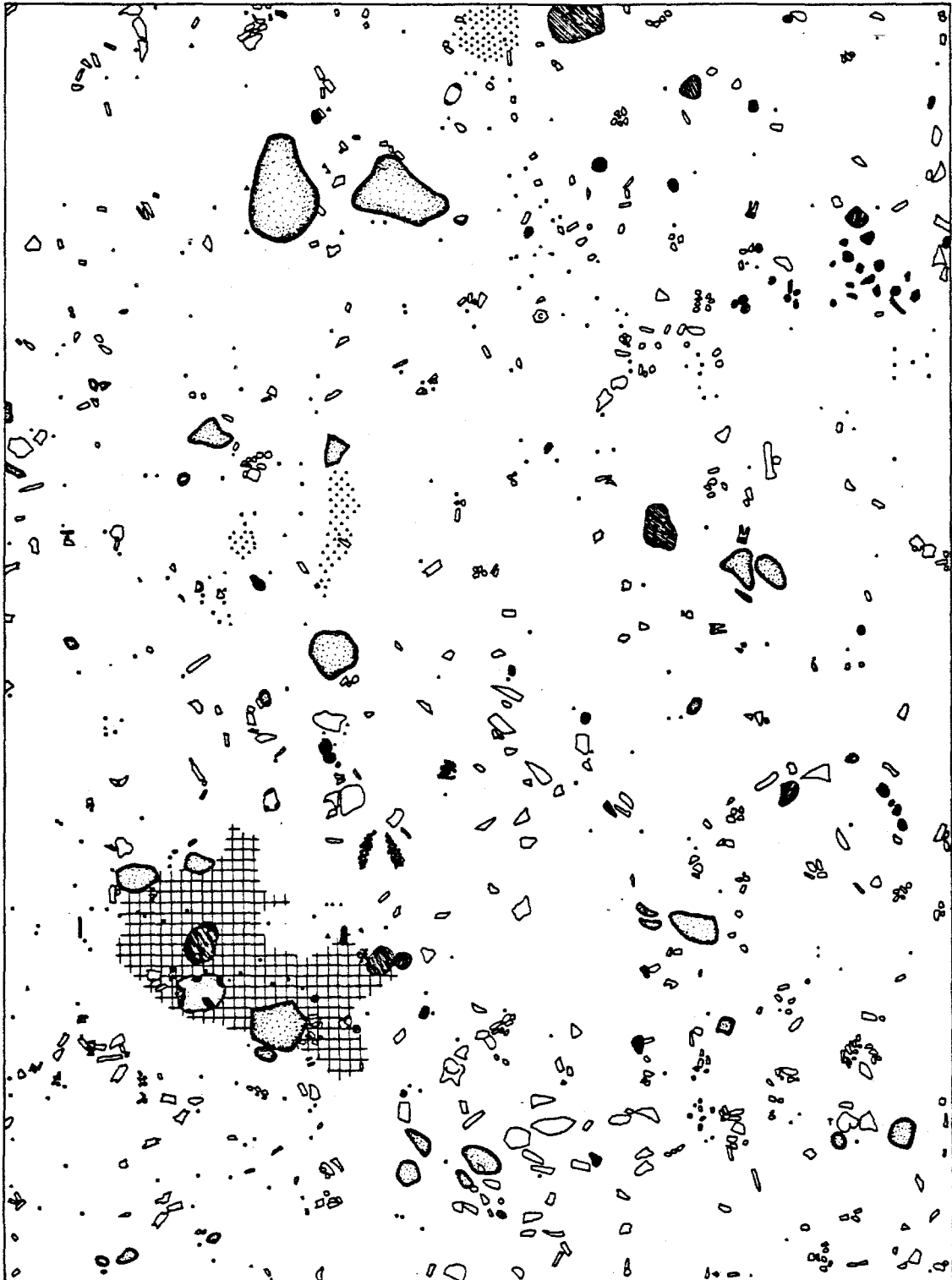
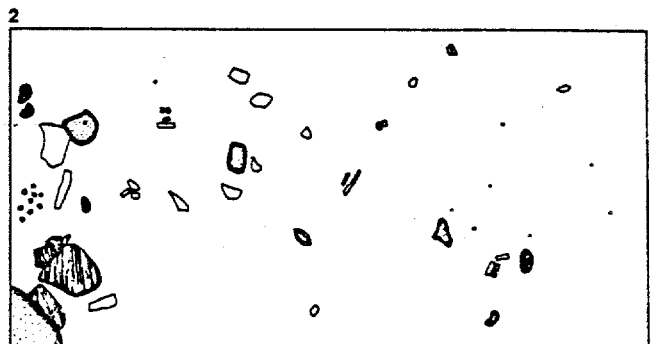
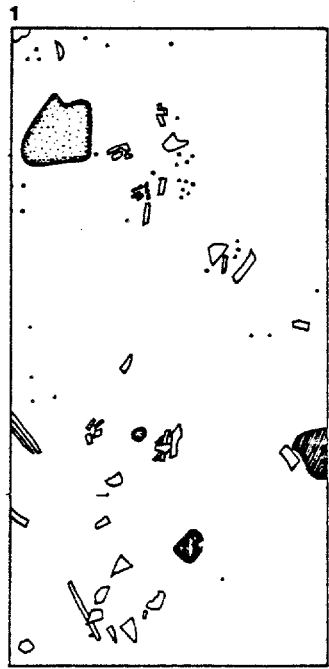
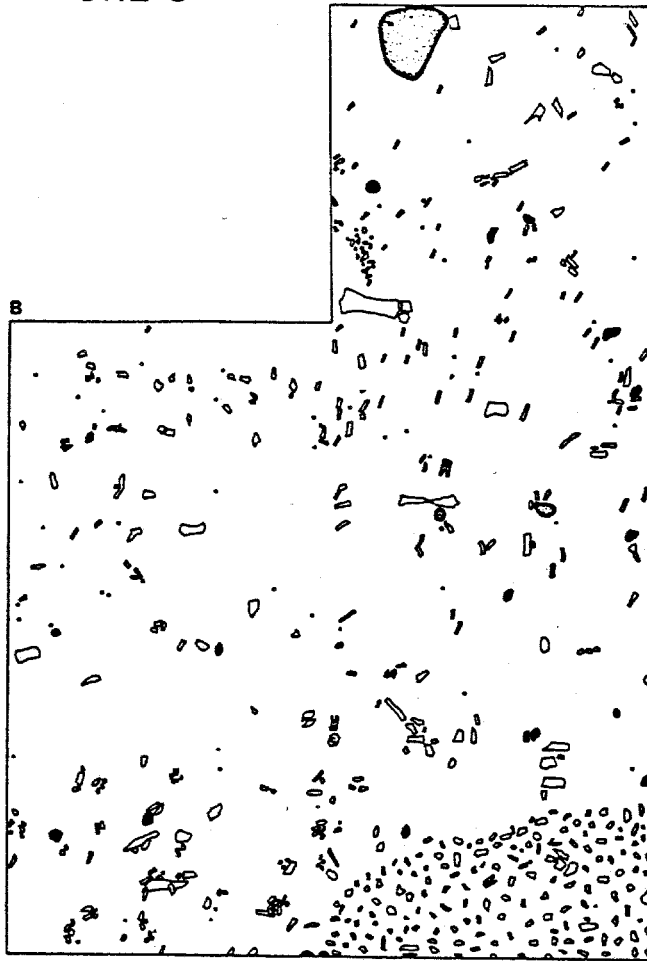


FIGURE 5

EXCAVATION UNITS B & C
AND
TEST UNITS 1 & 2
LEVEL 1

- Projectile Point
- Flake
- Detritus
- Blank
- Embowager
- Fire Cracked Rock
- Core
- Rock
- Bone
- Burned Bone
- R. 9 Tooth
- Shell



Side-Notched, one is a Prairie Side-Notched point and one is reminiscent of the Avonlea type. Another five items are tip and mid-section fragments which are not identifiable as to type. The remaining projectile point is a base fragment of an unnotched, triangular form. As described by Dyck (1983), both Plains Side-Notched and Prairie Side-Notched projectile points are small arrow points with triangular bodies. The major morphological difference between them is that side-notch of the Prairie Side-Notched variety is very close to the basal edge while it is well removed from the basal edge of the Plains Side-Notched variety. The Avonlea type is triangular with small side-notches close to a basal edge which is generally concave. The presence of these projectile point types suggests that at least two and as many as three occupations have been included in cultural level 1. If three occupations are represented they could be described as follows: Avonlea at A.D. 1045, Prairie Side-Notched at A.D. 1315 and Plains Side-Notched at A.D. 1470. Another possibility is that there are only two occupations. The first may have taken place during the transition from Avonlea to Prairie Side-Notched. This occurs at a number of sites in Saskatchewan including the Estuary Bison Pound and the Bakken Wright sites (Adams 1975 and 1977) and the Sheep Camp site (Cazakoff 1986 personal communication) The second is a Plains Side-Notched occupation.

Chalcedony and fine-grained quartzite were the most common lithic raw material types used for the production of

projectile points in the level 1 occupation of the Amisk site where five points made of each were found. Another three were made of Swan River chert as well as one each of chert and welded volcanic tuff. Projectile points were recovered from excavation units A, B and C and the north-south and east-west trenches. The metric attributes of these items are presented in Table 1. Some of the projectile points are illustrated in Figure 6 and all are shown in Plate 7, row 1.

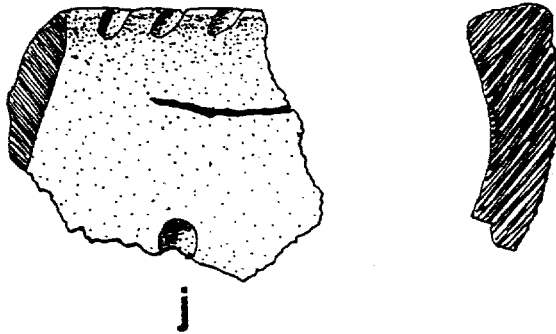
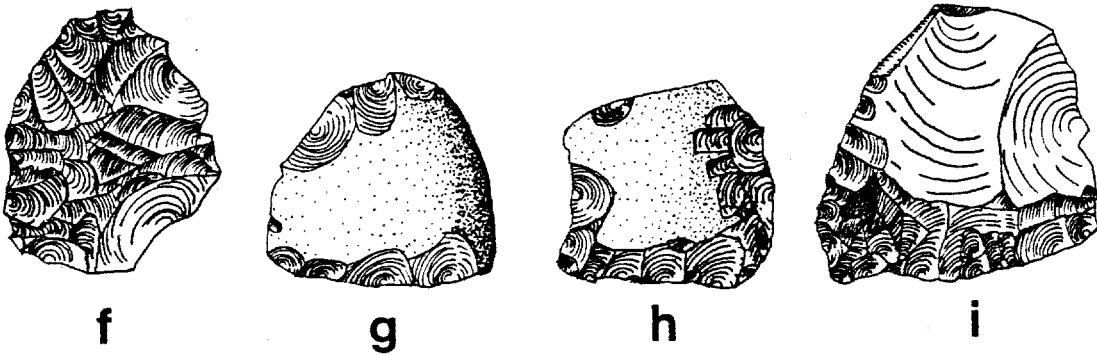
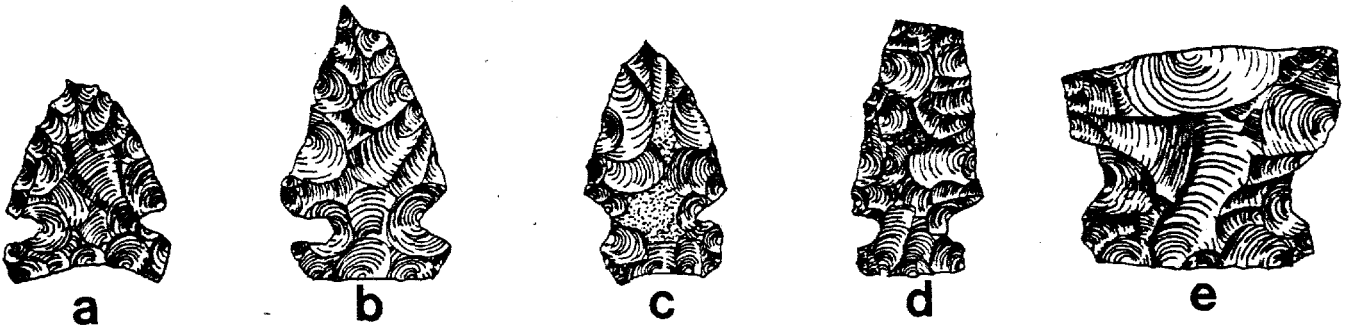
TABLE 1: Projectile Point Metric Attributes in mm for Level 1.

SPECIMEN # (FbNp-17-)	MAXIMUM LENGTH	MAXIMUM WIDTH	MAXIMUM THICKNESS	BASAL WIDTH	LEFT NOTCH WIDTH	RIGHT NOTCH WIDTH
360	NA	10.7	2.5	NA	NA	1.4
361	NA	NA	NA	13.0	NA	NA
668	NA	12.7	3.4	9.2	NA	NA
1627	NA	12.9	3.7	NA	NA	NA
2324	NA	11.9	3.8	10.0	3.8	2.8
2325	NA	12.6	4.4	10.9	3.5	2.5
2776	NA	16.8	5.6	NA	NA	NA
2841	19.7	11.8	3.7	10.0	2.0	6.3
2982	NA	12.0	5.6	NA	NA	NA
3176	18.2	13.5	3.8	13.5	1.5	1.0
3452	NA	14.0	3.6	NA	NA	NA
3535	NA	13.7	3.6	12.1	3.6	3.4
7035	24.5	15.9	5.0	13.6	4.5	3.5
7050	NA	14.5	4.5	NA	3.5	NA
MEAN	20.80	13.30	4.09	11.54	3.20	2.99
STANDARD DEVIATION	2.69	1.69	0.86	1.63	0.98	1.61

Bifacial Knives. Twelve biface fragments were found in level 1. Eleven are fragments of ovoid knives while one is a fragment of a hafted knife.

The ovoid knives are small to medium sized with lenticular cross sections. None appear to have been backed knives. The probable function of these artifacts was that of

FIGURE 6: ARTIFACTS of LEVEL 1



Projectile Points: a; b; c; d
 Hafted Biface: e
 Ovoid Biface: f
 Endscrapers: g; h; i
 Pot Sherd: j



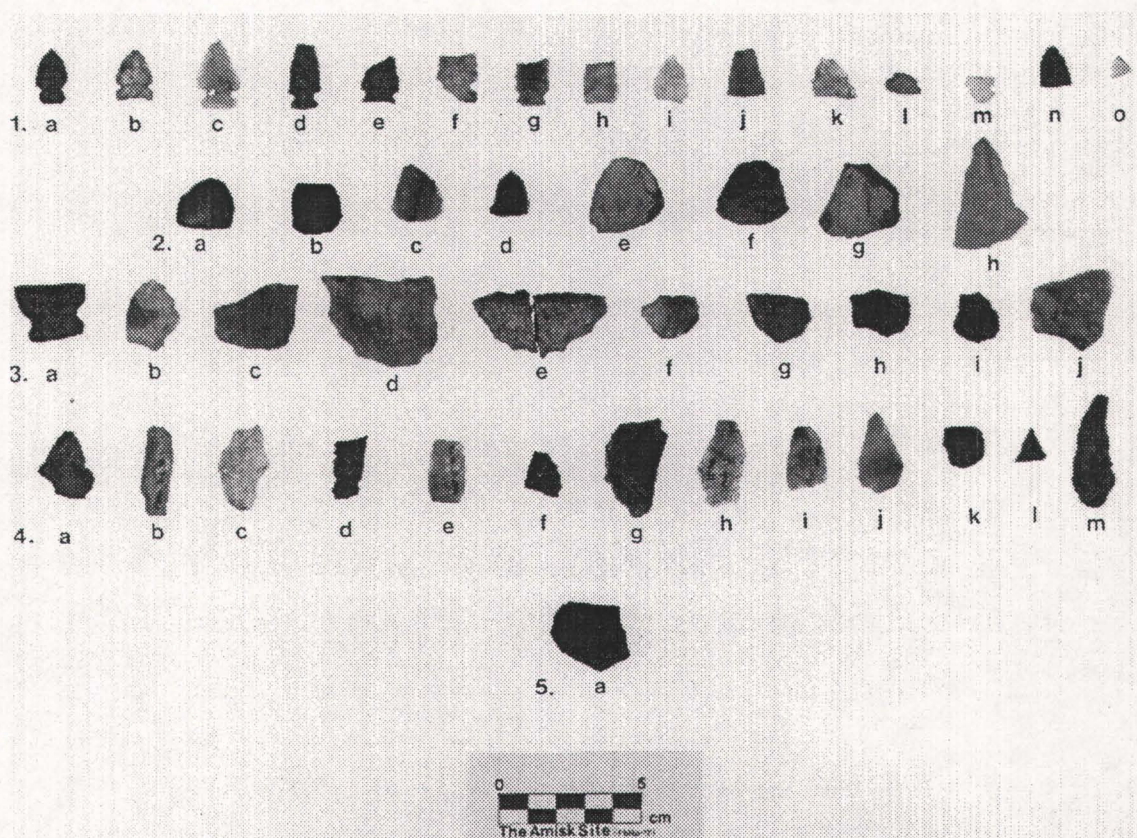


PLATE 7. Level 1 Chipped Stone Items
1. Projectile Points
2. Endscrapers
3. Bifaces
4. Retouched Flakes
5. Pot Sherd

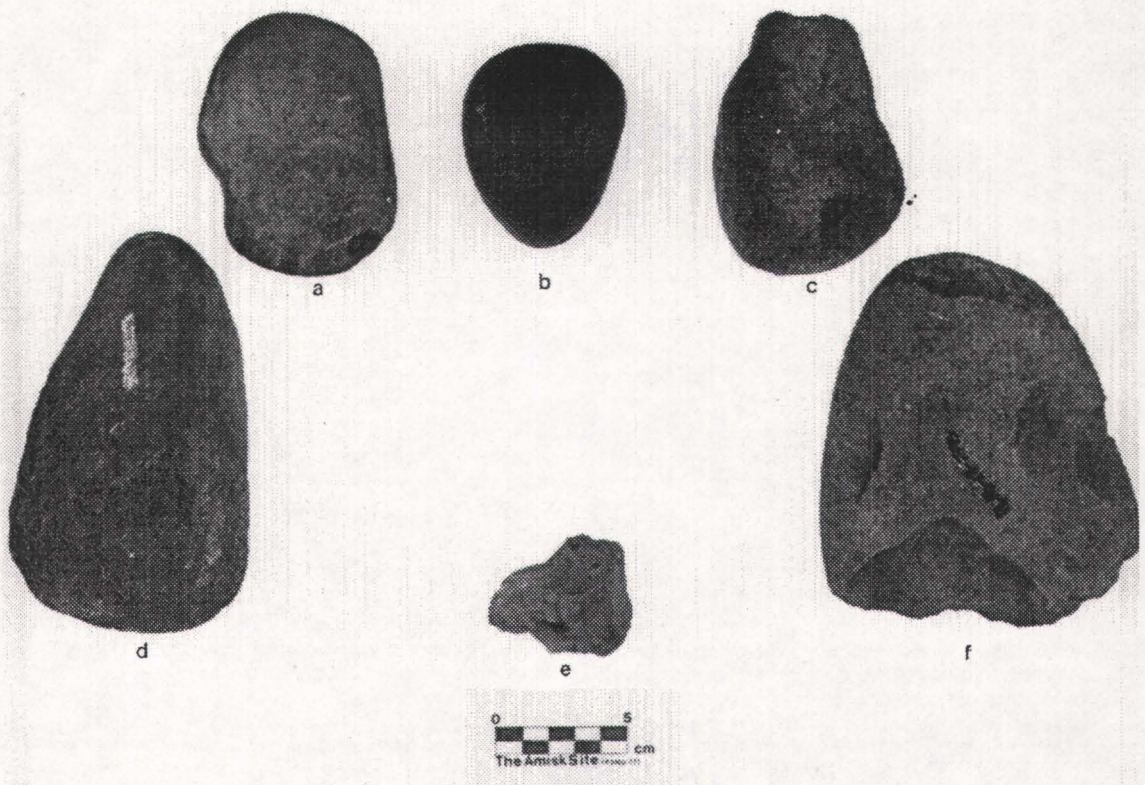


PLATE 8. Level 1 Cobble Tools and Core
a-d. Hammerstones
e. Core
f. Grooved Maul / Anvil

a hand-held cutting tool. The diagonal and transverse fractures exhibited by these biface fragments likely reflect a combination of inherent weaknesses in the material and failed attempts at resharpening and repair. These items were found throughout the excavated area of the site. They were produced from various materials including quartzite, chert, Swan River chert, chalcedony and petrified wood.

The hafted knife was found in square 81S, 16E near the north end of the north-south trench. It is made from brown chert with a lenticular cross section and a transverse fracture at the mid point of the body leaving only the lower half of the tool. Broad side-notches serve as the hafting mechanism. Metric attributes of the more complete bifaces are presented in Table 2. Some of these items are illustrated in Figure 6 and all are shown in Plate 7, row 3.

TABLE 2: Biface Metric Attributes in mm for Level 1.

SPECIMEN # (FbNp-17-)	MAXIMUM LENGTH	MAXIMUM WIDTH	MAXIMUM THICKNESS
630	NA	46.3	11.2
647	NA	20.5	7.5
650	NA	NA	4.9
859	NA	21.9	6.4
1801	NA	28.7	7.8
2282	NA	40.9	12.0
2851	NA	19.8	4.9
2916	NA	25.6	5.2
3607	NA	NA	5.5
4076	NA	20.5	4.6
6374	NA	29.9	6.5

Endscrapers. Eight endscrapers were found in various locations in level 1 including excavation unit A, B and C and

the east-west trench. Two of these were produced on split black pebbles much like those found at numerous sites of various ages in Saskatchewan (Walker 1980), (Adams 1977), (Dyck 1970). These are small, thick, largely unmodified fragments with an ovoid outline and a steeply flaked working edge with an average angle of 55 degrees. They exhibit a biplanar to slightly plano-convex profile.

Another four are finely made triangular endscrapers of which three are chert and one is brown calcedony. They are made on flakes with a skewed plano-convex profile. The dorsal surfaces are ridged due to the presence of flake scars. One chert endscraper retains the cortex of the original cobble over much of its surface. The ventral surfaces are generally smooth with a bulb of percussion and percussion rings. The proximal end of each endscraper retains a striking platform and the distal or working edge is steeply flaked and generally the thickest part of the tool. The average edge angle is 64 degrees.

The remaining two endscrapers are very crudely made and are included in this category because of their roughly triangular outlines and deliberate, unifacial retouch on the distal edges. They are made on thick flakes with a biplanar profile and whose shape remains unmodified. The average working edge angle is 58 degrees. One of these items is made of quartzite and the other of welded volcanic tuff. The metric attributes of all the endscrapers are presented in

Table 3. Some are illustrated in Figure 6 and all are shown in Plate 7, row 2.

TABLE 3: Endscraper Metric Attributes in mm for Level 1.

SPECIMEN # (FbNp-17-)	MAXIMUM LENGTH	MAXIMUM WIDTH	MAXIMUM THICKNESS	DISTAL EDGE ANGLE
928	20.5	18.3	6.4	55
2125	25.5	27.0	6.8	65
2635	13.0	17.0	6.7	70
2862	18.9	18.0	5.0	50
3220	18.4	20.5	5.0	60
3687	29.0	28.0	8.3	65
4009	39.0	28.0	10.6	50
7008	22.9	25.7	11.5	65

Retouched and Utilized Flakes. Twelve items in this category were found in level 1 at the Amisk site. Retouched flakes are those which display deliberate flake removal at the periphery for the creation of a working edge. Utilized flakes are unmodified but exhibit evidence, such as edge damage and wear, of use as tools. Two flakes fit the latter category while 10 fit the former. There is no apparent pattern in these items. The form of the tool is dependant entirely upon the shape of the flake. Five items have been unifacially retouched, four have been bifacially retouched and one exhibits both types of retouch. Chert appears to be preferred for production of retouched flakes with six of the 12 items made from this material. Other raw materials represented are Swan River chert, fine-grained quartzite, quartz and chalcedony. These items were found throughout much of the excavated area including excavation units A and C, the east-west trench and test units 1 and 2. They are considered to be expediency tools which saw limited use and were

discarded. The metric attributes of retouched and utilized flakes from level 1 are presented in Table 4. They are illustrated in Plate 7, row 4.

TABLE 4: Retouched and Utilized Flake Metric Attributes in mm for Level 1.

SPECIMEN # (FbNp-17-)	MAXIMUM LENGTH	MAXIMUM WIDTH	MAXIMUM THICKNESS	LENGTH of EDGE RETOUCH
797	22.6	14.9	6.2	32.4
1623	28.8	17.5	3.4	NA
1660	31.0	17.6	2.2	28.4
2033	31.2	19.0	6.7	23.7
3412	42.3	16.4	7.6	40.8
4013	23.6	12.0	4.6	23.2
4015	24.0	20.6	3.0	12.7
4018	35.4	20.0	13.7	27.8
5922	12.0	12.0	3.7	18.0
6274	14.9	13.8	4.8	18.0
6356	32.0	11.2	5.8	NA
6363	15.2	15.4	3.6	9.0
6397	22.9	13.7	4.8	21.9

Cores. One core, FbNp-17-7031, was found in square 81S, 12E, near the centre of the east edge of excavation unit A, during excavations of level 1 at the Amisk site. It is a roughly pyramidal shaped piece of fine-grained quartzite with one striking platform with an angle of 75 degrees. Several irregular flakes have been removed from each face of the core. It is 56.7 mm wide, 31.6 mm long and 46.4 mm in breadth. It is shown in Plate 8, e.

Hammerstone/Anvils. Five hammerstones were recovered from two locations in level 1. Three were discovered in the vicinity of hearth feature 1-1 (described below) and two were found just south of the centre of the north-south trench. Two of these items are palm sized cobbles with battered ends and

appear to have been used exclusively as hammers. The others exhibit evidence of multi-purpose functions. Two of these, apart from having battered ends as a result of hammering, have battered and chipped indentations at their centres indicating use as an anvil. The remaining hammerstone was found within hearth feature 1-1 in the southwest corner of excavation unit A (Figure 4). One end is battered from use as a hammer and an indentation in the middle of one side indicates use as an anvil. The beginnings of pecked grooves at the mid point of the lateral edges of the cobble appear to be an aborted attempt to make a grooved maul. Four large flakes have been removed from one end of the cobble to produce a coarse chopping edge. This edge displays dulling and chipping as a result of its chopping function. One side of this cobble tool has been scorched from the fire in which it was left. These items can be seen in Plate 8, a-d and f.

Lithic Raw Materials. Nine local and three exotic varieties of lithic raw materials are represented in the lithic assemblage of level 1 at the Amisk site. The local varieties include, in order of decreasing frequency by numbers of items: fine-grained quartzite; chert; Swan River chert; quartz; medium-grained quartzite; fine-grained igneous; petrified wood; jasper; and coarse-grained quartzite. The exotic varieties are chalcedony, welded volcanic tuff and obsidian. Details of the lithic assemblage are presented in Tables 5, 6 and 7.

TABLE 5: Frequencies of Lithic Materials by Number for Level 1

MATERIAL	FORM												TOTALS							
	Shatter		Flake		Point		Biface		Retouched Flake		End- scraper		Hammer- stone		Utilized Flake		Core			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
Fine- Grained Quartz	585	25.90	303	42.10	5	33.30	3	25.00	1	10.00					1	50.00	1	100.00	899	29.70
Chert	524	23.20	160	22.30	1	6.70	3	25.00	5	50.00	5	65.50			1	50.00			699	23.10
Swan River Chert	414	18.30	96	13.40	3	20.00	3	25.00	1	10.00									517	17.10
Quartz	344	15.20	30	4.20					1	10.00									375	12.40
Medium- Grained Quartz- ite	147	6.50	47	6.50			1	8.30	2	20.00	1	12.50							195	6.40
Chalced- ony	81	3.60	45	6.30	5	33.30	1	8.30											135	4.50
Fine- Grained Igneous	80	3.50	25	3.50									1	50.00					106	3.50
Petrified Wood	32	1.40	3	0.40			1	8.30											36	1.20
Jasper	30	1.30																	30	1.00
Volcanic Tuff	15	0.70	3	0.40	1	6.70					1	12.50	1	50.00					20	0.70
Coarse- Grained Quartz- ite	10	0.40	6	0.80							1	12.50	1	50.00					18	0.60
Obsidian			1	0.10															1	0.03
TOTALS	2,262	100.00	719	100.00	15	100.00	12	99.90	10	100.00	8	100.00	2	100.00	2	100.00	1	100.00	3,031	100.23

TABLE 6: Frequencies of Lithic Materials by Weight (in grams) for Level 1

MATERIAL	FORM																TOTALS			
	Shatter		Hammerstone		Flake		Core		Biface		Endscraper		Retouched Flake		Point		Utilized Flake		Wt.	%
	Wt.	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%		
Fine-Grained Quartzite	1,564.5	24.90			212.3	32.30	111.3	100.00	12.6	24.30			4.7	38.70	3.9	31.70	2.2	52.40	1,911.5	21.60
Swan River Chert	1,615.2	25.70			85.9	13.10			12.3	23.90			1.9	11.60	2.1	17.10			1,717.5	19.40
Coarse-Grained Quartzite	322.7	5.10	1,372.5	81.60							9.0	26.50							1,704.2	19.30
Quartz	1,062.7	16.90			28.8	4.40							3.7	22.60					1,095.2	12.40
Medium-Grained Quartzite	787.5	12.50			81.7	12.40			15.4	29.80									884.6	10.00
Chert	659.7	10.50			151.6	23.10			8.3	16.00	17.2	50.60	4.7	28.70	0.9	7.30	2.0	47.60	844.4	9.50
Fine-Grained Igneous	117.0	1.90	309	18.40	59.0	9.00													485.0	5.50
Petrified Wood	88.0	1.40			2.7	0.40			1.9	3.70			1.4	8.50					94.0	1.10
Chalcedony	48.2	0.80			24.1	3.70			1.3	2.50	2.4	7.10			5.0	40.70			81.0	0.90
Volcanic Tuff	14.0	0.20			10.2	1.60					5.4	15.90			0.4	3.30			30.0	0.30
Jasper	2.5	0.04																	2.5	0.03
Obsidian					0.5	0.10													0.5	0.01
TOTALS	6,282.0	99.94	1,681.5	100.00	656.8	100.10	111.3	100.0	51.9	100.20	34.0	100.10	16.4	100.10	12.3	100.10	4.2	100.00	8,850.4	100.04

TABLE 7: Frequencies of Lithic Forms by Number and Weight for Level 1

FORM	NUMBER	PERCENTAGE	WEIGHT	PERCENTAGE
Shatter	2,262	74.60	6,282.0	71.00
Flake	719	23.70	656.8	7.40
Projectile Point	15	0.50	12.3	0.10
Bifacial Knife	12	0.40	51.9	0.60
Retouched Flake	10	0.30	16.4	0.20
Endscraper	8	0.30	34.0	0.40
Hammerstone	2	0.10	1,681.5	19.00
Utilized Flake	2	0.10	4.2	0.05
Core	1	0.03	111.3	1.30
TOTAL	3,031	100.03	8,850.4	100.05

Fire-Cracked Rock. Three hundred and sixty-five pieces of fire-cracked rock with a total weight of 40,324.6 grams and an average weight of 110.5 grams were found scattered throughout the excavated area of level 1.

Pottery. Forty-four highly fragmented pot sherds were found in level 1. Most of these were recovered from excavation unit A. Pot sherds were also found at the west end of the east-west trench, excavation unit C and the south end of the north-south trench. All are small body sherds with the exception of one rim sherd which has small, diagonal, subtle, linear impression on the lip. (Figure 6, j Plate 7, row 5, a). Interior and exterior surfaces and cross sections are dark brown to black. According to Meyer (personal communication) the thin, well paddled and compact nature of this sherd as well as the slightly flattened, bevelled lip suggests that this represents a late type which is most likely associated the Plains Side-Notched assemblage of level 1. The carbonized material on the inner surface of this sherd indicates that it is from a cooking pot. The temper of this sherd is a crushed granite. A number of other sherds from this level have a sand temper. One body sherd in particular is well paddled and quite thick with a cord marked outer surface. The cord impressions indicate that the cord was not twisted. The thickness, color and temper of this sherd differ from that of the rim sherd described above. This suggests that the remains of at least two pots are present.

6.1.2 Faunal Assemblage. Preservation of faunal remains in level 1 is excellent. The number of identified specimens or NISP is an index of species abundance based on the total number of complete and fragmentary bone assigned to a species (Klien and Cruz-Uribe 1984). Due to the overwhelming abundance of bison remains it is assumed that comminuted bone is bison. Bone in this occupation has been highly fragmented as reflected in the total inventory of 20,190 pieces. Seven species are represented in these remains. Bison is the most common with an NISP of 20,172 or 99.9% of all remains. Only 344 or 1.7% of these are identifiable to specific skeletal element. The remaining 98.3% or 19,828 pieces are comminuted bone of which 1,828 or 9.2% are burned. Clam (Unio sp.) has an NISP of eight while dog (Canis sp.) is represented by six fragments. One identifiable specimen of each of antelope, bird, fish, and ground squirrel were also found. The total inventory of bone, complete and fragmentary, (based on Speth 1983), is given in Table 8.

The minimum number of individuals or MNI is an index of species abundance which provides more precise information about the frequencies of species represented in a faunal assemblage (Klien and Cruz-Uribe 1984). The MNI is a measure of the number of individuals necessary to account for the total inventory of remains for each species. Calculation of the MNI for faunal remains recovered from the Amisk site is based on specifically identifiable bones and bone fragments

TABLE 8: Total Inventory of Faunal Remains, Complete and Fragmentary for Level 1.

BISON:	Element	Number	Percentage
	1. Cranium	53	0.3
	2. Mandible	4	0.02
	3. Hyoid	1	0.005
	4. Misc. Loose Incisor/Canine	4	0.02
	5. Misc. Loose Premolar/Molar	16	0.1
	6. Misc. Tooth Frags.	46	0.2
	7. Atlas		
	8. Axis		
	9. Cervical Vertebra (3-7)		
	10. Thoracic Vertebra (1-14)	3	0.01
	11. Spinous Process		
	12. Lumbar Vertebra (1-5)	5	0.02
	13. Sacrum		
	14. Caudal Vertebra		
	15. Unident. Vertebra Frags.		
	16. Rib	38	0.2
	17. Sternum		
	18. Scapula	3	0.01
	19. Humerus	1	0.005
	20. Radius	6	0.03
	21. Ulna	5	0.02
	22. Radial Carpal	5	0.02
	23. Ulnar Carpal		
	24. Internal Carpal	1	0.005
	25. Unciform Carpal	1	0.005
	26. Accessory Carpal	7	0.03
	27. Fused 2nd/3rd Carpal	1	0.005
	28. Metacarpal	4	0.02
	29. Ischium		
	30. Ilium		
	31. Pubis		
	32. Innominate Frags.		
	33. Femur	22	0.1
	34. Patella		
	35. Tibia	20	0.1
	36. Tibial Tarsal	4	0.02
	37. Calcaneous		
	38. Lateral Malleolus	7	0.03
	39. Fused 2nd/3rd Tarsal	3	0.01
	40. Fused Central/4th Tarsal	1	0.005
	41. Metatarsal	4	0.02
	42. Metapodial Frags.	17	0.1
	43. First Phalanx	27	0.1
	44. Second Phalanx	19	0.1
	45. Third Phalanx	10	0.05
	46. Inferior Sesamoid		
	47. Sesamoid	6	0.03
	48. Unident. Bone Frags.	19,828	98.3
	TOTAL =	20,172	100.0

NON-BISON FAUNAL REMAINS

Species	Element	Number
Clam	Valve	8
Fish	Bone Frag.	1
Antelope	Metapodial	1
Bird	Radius	1
Canis sp.	Bone Frag.	2
Canis sp.	Carpal	1
Canis sp.	Patella	1
Canis sp.	Premolar	1
Canis sp.	Maxilla	1
Ground Squirrel	Femur	1

TABLE 9: Calculation of Minimum Number of Individuals for Bison in Level 1.

Element	Side	Number	MNI
1. Metacarpal	1R	1	1
2. Internal Carpal	1R	1	1
3. Radial Carpal	3L 2R	5	3
4. Unciform Carpal	1R	1	1
5. Radius	1L	1	1
6. Humerus	1R	1	1
7. Scapula	1L	1	1
8. Fused 2nd/3rd Tarsal	2L 1R	3	2
9. Fused Central/4th Tarsal	1R	1	1
10. Tibial Tarsal	2L 1R	3	2
11. Lateral Malleollus	2L 4R	6	4
12. Tibia	2L 1R	3	2

MNI = 4

which are divided by side where applicable. The MNI for bison is four. The calculation of the MNI is presented in Table 9. The low number of individual bison compared with the high number of bone pieces is an indication of the degree of fragmentation to which faunal remains were subject during the occupation of level 1.

6.1.3 Features.

Feature 1-1 Hearth. This is an elongated, irregularly shaped area of fire-reddened and blackened soil, burned bone and charcoal found at the junction of four excavation squares in the southwest corner of excavation unit A (Figure 4). It is about 1 m long in a northeast-southwest direction and about 50 cm wide with a maximum depth of 5 to 7 cm. The feature contained several medium to large cobbles and pieces of fire-cracked rock as well as a large cobble tool (described above) which, due to its scorched surface, appears to have been discarded in the hearth while the fire was still burning. Surrounding the hearth are fragmented bison bones, two hammerstones, two biface fragments and many pieces of lithic detritus. Choroplethic maps in Figures 7 and 8 indicate that both lithic artifacts and faunal remains are more densely concentrated on the north and west sides of the hearth than on the south and east sides.

Feature 2-1 Bone Cluster. This feature was not completely exposed during excavations at the Amisk site. It is an extremely dense concentration of highly fragmented bone

in the southeast corner of square 80S, 21E which is at the southeast corner of excavation unit B (Figure 5). Of the total of 20,190, 5,224 bone fragments were found in square 80S, 21E. This represents 25.9% of the faunal remains in level 1 in only 2.4% of the excavated area. This feature appears to be the site of bone smashing for the removal of marrow.

6.1.4 Summary. Level 1 is a number of occupations by people bearing a late prehistoric cultural assemblage. This cultural level differs from more ancient levels at the Amisk site in a number of ways. The excavated area reveals a relatively more dense accumulation and greater vertical distribution of lithic debitage and faunal remains which perhaps indicates a more extended period of use of the site area whether in one long occupation or a series of occupations in a short time period. This assumption can only be tested, however, through more extensive excavations of all the cultural levels at the Amisk site. Of the total 6,381 lithic items recovered from all seven cultural levels 3,031 or 47.5% were found in level 1. The situation with faunal remains is similar. Of 45,958 pieces recovered 20,190 or 43.9% were found in level 1. The highly smashed condition of bone is quite distinctive in level 1 at the Amisk site. The MNI for bison in level 1 is four which is close to the average MNI of 3.5 for all levels yet the number of bone fragments is more than twice that of any other level. This suggests that the breakage of bone was an activity which was intensively pursued

in level 1.

The scarcity of large bone fragments indicates that only the last stages of food processing occurred at the Amisk site during the level 1 occupation. Bone smashing activities are indicated by feature 2-1 (described above) and the generally fragmentary nature of bone. The presence of 365 pieces of fire-cracked rock and the hearth feature 1-1 (described above) are evidence of cooking activities here. The killing and primary butchering of bison carcasses occurred at a site of presently unknown location but possibly at the neighboring Newo Asiniak kill site.

The accumulation of lithic debris throughout the excavated area and in several tight clusters in the centre and north end of excavation unit A (Figure 4) suggests that the manufacture and repair of chipped stone tools was a common activity during the level 1 occupation at the Amisk site. There is no spatial segregation of tool classes in the excavated area. That is, no apparent activity areas in which specific tool types were used have been found. In fact, the most characteristic locational attribute of all tool classes is their occurrence throughout the excavated area. Figures 7 and 8 are choroplethic maps which indicate that lithic artifacts were most densely accumulated on the west side of excavation unit A, to the northwest of hearth feature 1-1, and that faunal remains are most densely accumulated in excavation unit B, in the vicinity of the bone smashing feature 2-1.

FIGURE 7
LEVEL 1
Density of Lithic Artifacts

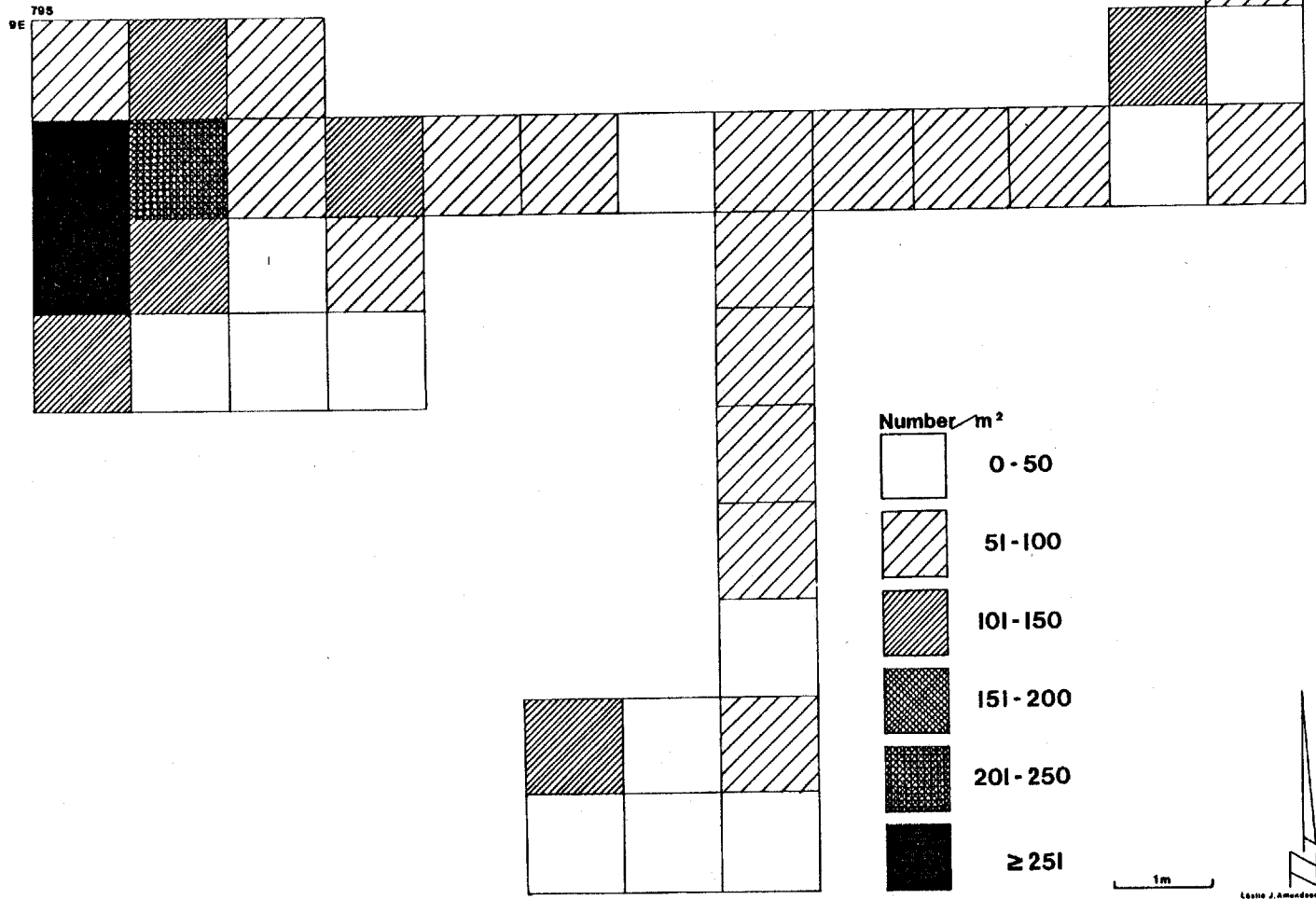


FIGURE 8
LEVEL 1
Density of Faunal Remains



6.2 Level 2

6.2.1 Cultural Assemblage.

Planviews of artifact distributions are given in Figures 9 and 10.

Lithic Artifacts.

Debitage. Eight hundred and twenty-seven lithic artifacts were recovered during excavations in level 2 at the Amisk site. Of these 819 or 99% are debitage; 549 or 66.4% are shatter and 270 or 32.6% are flakes. This debitage is unevenly distributed in level 2 with the majority of it found in excavation unit B (Figure 10 and 12).

Bifacial Knives. There were three bifaces found in level 2 at the Amisk site. One, FbNp-17-1062, is an incomplete hafted knife made of welded volcanic tuff. It was found in square 80S, 9E near the centre of the west edge of excavation unit A (Figure 9). It is missing a large part of the body and tip and all of the base. The shoulders and parts of the side-notches are intact. The entire surface of the tool has been thinned and there is fine bifacial retouch at the edges.

FIGURE 9
EXCAVATION UNIT A
LEVEL 2

- Flake
- Detritus
- ◐ Biface
- ◑ Core
- ◒ Fire Cracked Rock
- ◓ Rock
- ◔ Bone
- ◕ Burned Bone

20 cm

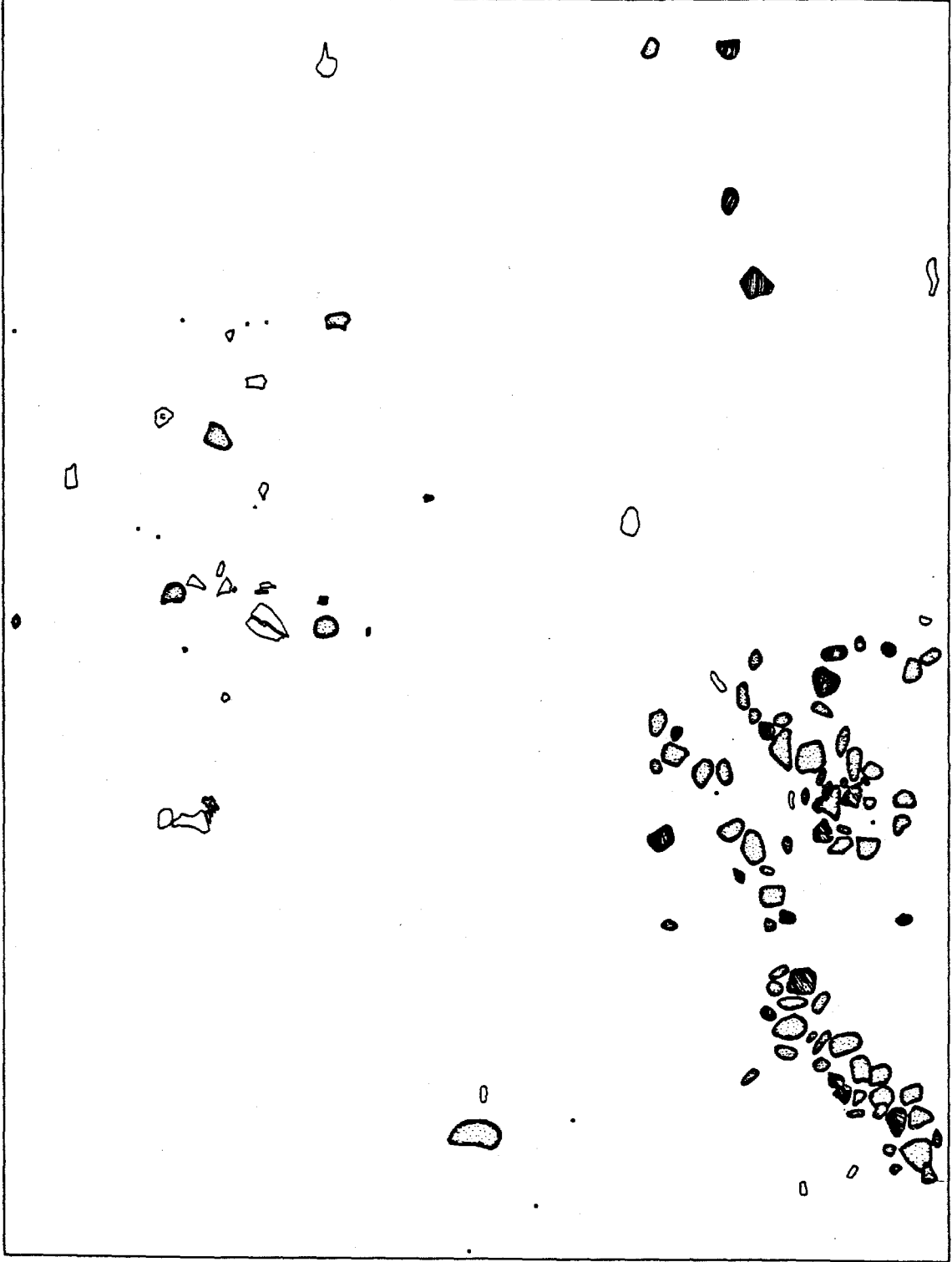
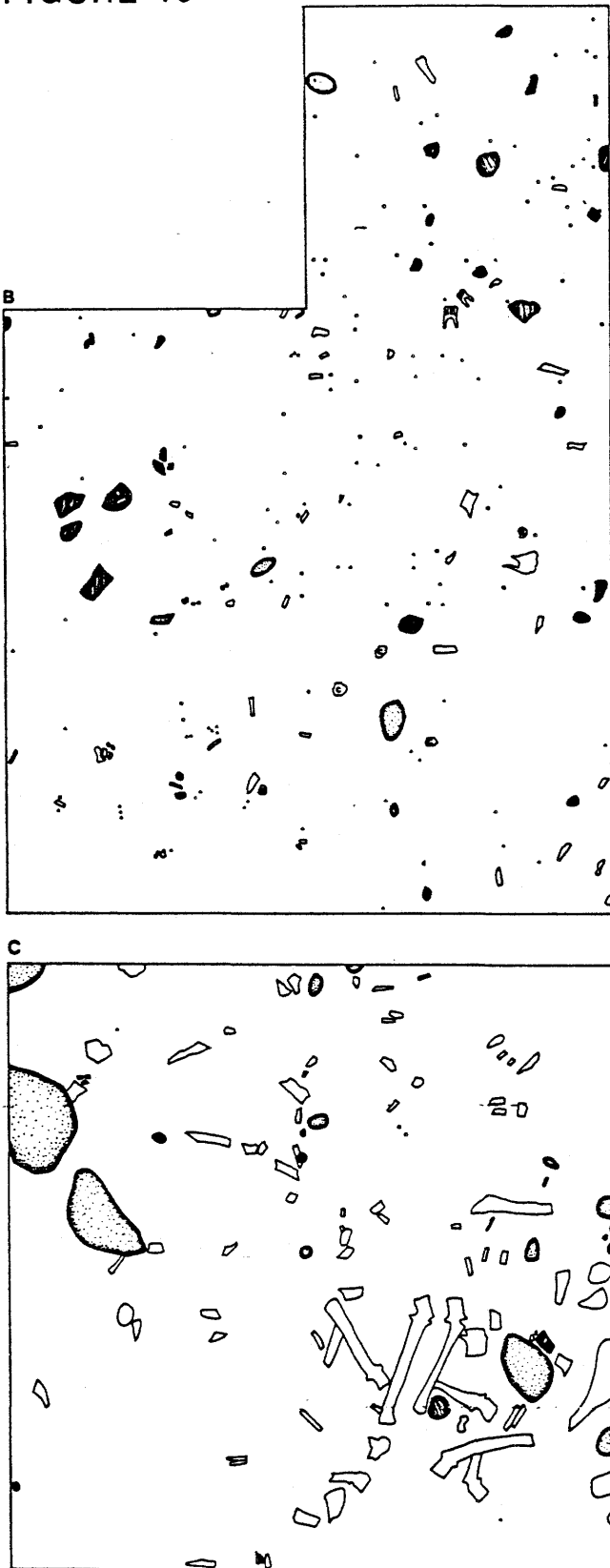
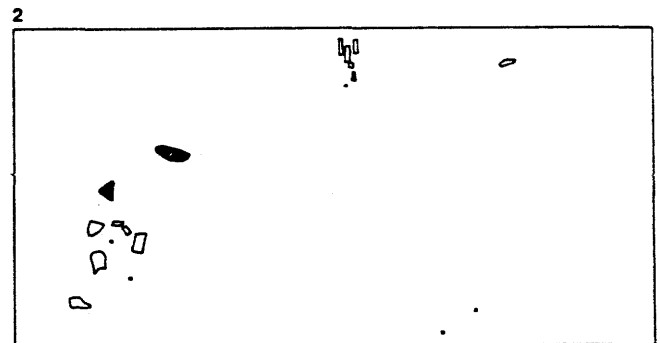
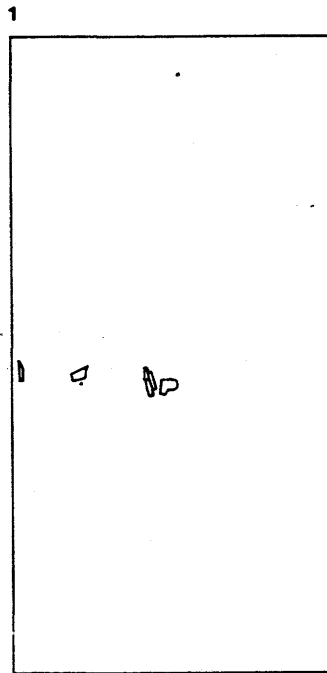


FIGURE 10



EXCAVATION UNITS B&C
AND
TEST UNITS 1&2
LEVEL 2

- 1 Projectile Point
- Flake
- Debitage
- ▀ Stone
- Core
- Fine Crushed Stone
- Bone
- Wood
- ▭ Tool
- Shell



The second, FbNp-17-1069, is a fragment of a very crudely made biface. It is a roughly triangular piece of petrified wood with a large hinge fracture at the proximal end. The other two edges are bifacially retouched. Thinning of the entire tool was prevented by the many cleavages inherent in the material. This biface was found in square 80S, 21E which is at the southwest corner of excavation unit B (Figure 10).

The third biface, FbNp-17-1078, was also found in square 80S, 21E. It is finely made on fine-grained quartzite and is rectangular in shape. Thinning flakes have been removed across both surfaces and the edges have been carefully worked. The transverse breakage of this tool makes determination of its overall original shape impossible. Metric attributes of these items are presented in Table 24. They are shown in Plate 9, b, c and d and two are illustrated in Figure 11.

Sidescrapers. FbNp-17-4137 is a large, very crude flake of fine-grained quartzite with a unifacially worked scraping edge. It was found on the west side of excavation unit B (Figure 10) in square 79S, 20E. It is 56.3 mm long, 62.8 mm wide and 27.3 mm thick. This item is illustrated in Plate 9, g.

Cores. Two Swan River chert cores were discovered during the excavation of level 2 at the Amisk site. One,

FbNp-17-1082, is a small core fragment from which two long, narrow flakes have been struck. It is 36 mm long, 19.5 mm wide and 10 mm in breadth. The proximal edge of the core served as the striking platform. This core was found in square 80S, 21E at the southeast corner of excavation unit B (Figure 10).

The second core, FbNp-17-5945, is an irregular shaped cobble with the cortex still intact over a portion of its surface. There is one striking platform from which several flakes were struck. The presence of large vugs in this material interfered with flake removal and limited the utility of this core. It is 42.7 mm long, 41.1 mm wide and 33.4 mm in breadth. The angle of the striking platform is 85 degrees. This item was found in square 80S, 11E in the middle of the east side of excavation unit A (Figure 9). These cores are displayed in Plate 9, e and f.

Hammerstones. Three hammerstones were recovered from level 2. FbNp-17-444 is a palm sized cobble of medium-grained quartzite 63.5mm long, 77.9 mm thick and 33.3 mm thick. One end is slightly battered while the other end is missing due to the removal, by hammering, of several large fragments. This tool was found in square 80S, 10E near the centre of excavation unit A (Figure 9). It may have also been used as a chopping tool.

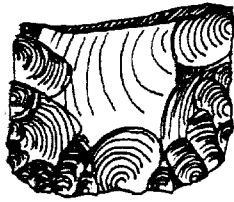
FbNp-17-1084 is a large, irregularly shaped cobble of a

FIGURE 11
ARTIFACTS of LEVEL 2



a

Bone Point



b

Biface



c

Hafted Biface



Leslie J. Amundson

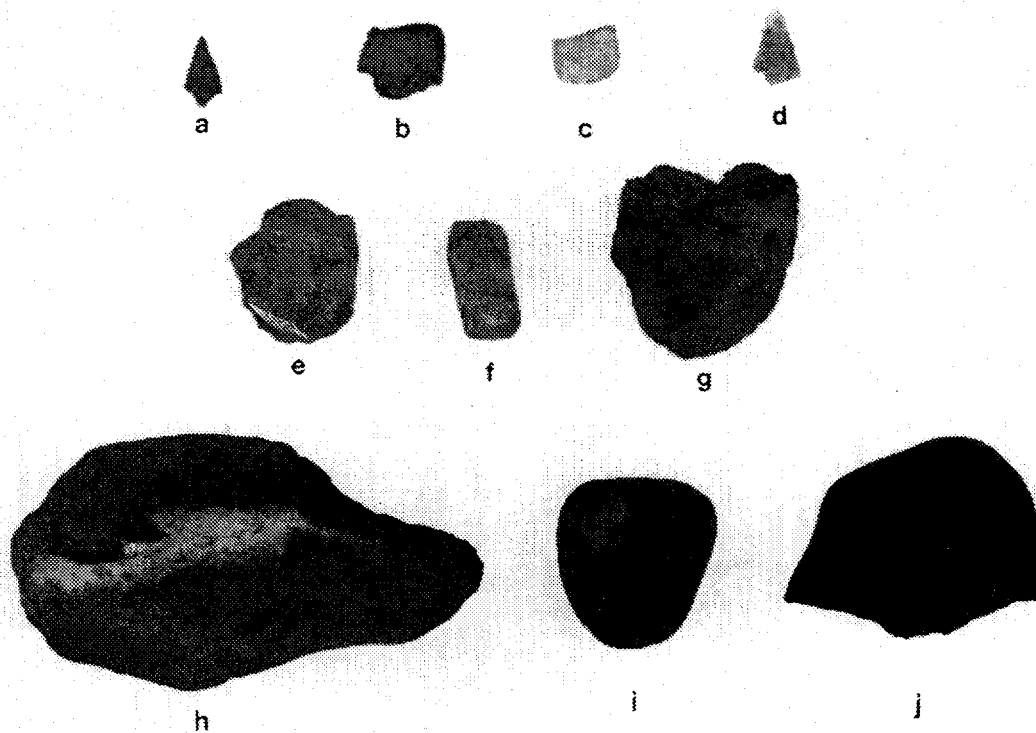


PLATE 9. Level 2 Tools and Cores

- a. Bone Point
- b-d. Bifaces
- e-f. Cores
- g. Uniface
- h-i. Hammerstones
- j. Chopper

fine-grained igneous material. It is 155 mm long, 71.6 mm wide, and 62.9 mm thick. This cobble has one pointed end from which a number of flakes have been removed due to hammering. It was recovered from square 80S, 21E at the southeast corner of excavation unit B (Figure 10).

FbNp-17-3826 is a small cobble of fine-grained igneous material. It was found in square 82S, 16E near the north end of the north-south trench. Both ends are battered indicating its use as a hammer. It is 51.8 mm long, 48.9 mm wide and 38 mm thick. All three hammerstones are shown in Plate h-j.

Lithic Raw Materials. Eleven lithic raw material types are represented in the lithic assemblage of level 2. Nine of these are local types. They are, in order of decreasing frequency by numbers of items: chert; fine-grained quartzite; Swan River chert; medium-grained quartzite; fine-grained igneous; fused shale; coarse-grained quartzite; and petrified wood. Exotic varieties are chalcedony and welded volcanic tuff. Details of the lithic assemblage of level 2 are presented in Tables 10, 11 and 12.

Fire-Cracked Rock. Eighty-five pieces of fire-cracked rock with a total weight of 14,450.3 grams and an average weight of 170 grams were recovered from level 2 at the Amisk site. Many of these were found in excavation unit B (Figure 10) but were associated with no particular feature.

TABLE 10: Frequencies of Lithic Materials by Number for Level 2

MATERIAL	FORM										TOTALS			
	Shatter		Flake		Biface		Core		Hammer-stone		Uniface		No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
Chert	203	37.0	73	27.0								276	33.4	
Fine-Grained Quartzite	64	11.7	71	26.3	1	33.3					1	100.0	137	16.6
Quartz	111	20.2	12	4.4									123	14.9
Swan River Chert	73	13.3	28	10.4			2	100.0					103	12.5
Medium-Grained Quartzite	42	7.7	23	8.5					1	33.3			66	8.0
Chalcedony			45	16.7									45	5.4
Fine-Grained Igneous	25	4.6	13	4.8					2	66.7			39	4.7
Shale	19	3.5											19	2.3
Coarse-Grained Quartzite	9	1.6	3	1.1									12	1.5
Petrified Wood	3	0.5	2	0.7	1	33.3							6	0.7
Volcanic Tuff					1	33.3							1	0.1
TOTALS	549	100.0	279	99.9	3	99.9	2	100.0	2	100.0	1	100.0	827	100.1

TABLE 11: Frequencies of Lithic Materials by Weight (in grams) for Level 2

MATERIAL	FORM										TOTALS			
	Shatter		Hammer- stone		Flake		Uniface		Core		Biface		Wt.	%
	Wt.	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%
Fine- Grained Igneous	406.8	17.1	380.5	69.1	40.2	14.5							827.5	24.5
Quartz	721.0	30.3			16.1	5.8							737.1	21.9
Medium- Grained Quartzite	331.9	13.9	169.9	30.9	50.7	18.3							552.5	16.4
Fine- Grained Quartzite	228.2	9.6			57.0	20.6	85.8	100.0			2.3	27.7		
Chert	261.5	11.0			56.8	20.6							318.3	9.4
Swan River Chert	211.3	8.9			4.0	12.3		70.3	100.0				315.6	9.4
Coarse- Grained Quartzite	173.4	7.3			8.1	2.9							181.5	5.4
Shale	31.0	1.3											31.0	0.9
Petrified Wood	15.0	0.6			2.0	0.7				1.8	21.7		18.8	0.6
Chalcedony	11.4	4.1											11.4	0.3
Volcanic Tuff										4.2	50.6		4.2	0.1
TOTALS	2,380.1	100.0	550.4	100.0	276.3	99.8	85.8	100.0	70.3	100.0	8.3	100.0	1,371.2	100.0

TABLE 12: Frequencies of Lithic Forms by Number and Weight for
Level 2

FORM	NUMBER	PERCENTAGE	WEIGHT	PERCENTAGE
Shatter	549	66.40	2,380.1	70.60
Flake	270	32.60	276.3	8.20
Bifacial Knife	3	0.40	8.3	0.20
Core	2	0.20	70.3	2.10
Hammerstone	2	0.20	550.4	16.30
Uniface	1	0.10	85.5	2.50
TOTAL	827	99.90	3,371.2	99.90

Bone Tools. One bone tool was found in square 80S, 21E in the southeast corner of excavation unit B (Figure 10) in level 2. It is a thin flake of cortical bone which has been made into a stemmed projectile point. The edges of the point body are slightly polished. It is 22.8 mm long and 11.9 mm wide at the shoulder. It is illustrated in Figure 11 and in Plate 9, a.

Pottery. Level 2 is the lowest pottery bearing occupation at the Amisk site. Only one very small body sherd was found in 80S, 21E at the southeast corner of excavation unit B (Figure 10). The pottery appears to be very crude with a coarse, grit temper. This particular sherd is black on both surfaces and in cross section.

6.2.2 Faunal Assemblage. The preservation of bone in level 2 at the Amisk site is excellent. A total of 2,851 bone and tooth fragments were recovered here. Three species are represented in these remains. Bison is predominant with 99.8% of the total inventory of bone. Of the 2,847 NISP for bison, 190 (6.7%) are identifiable fragments and 2,657 are comminuted bone of which 314 pieces or 11.8% are burned. The other two species, Canis sp. and clam (Unio sp.), are represented by two fragments each. The MNI for bison is two. Calculation of the MNI is presented in Table 14. Table 13 is the total inventory of bone, complete and fragmentary.

6.2.3 Features. Two stone circle features were

TABLE 13: Total Inventory of Faunal Remains, Complete and Fragmentary for Level 2.

BISON:	Element	Number	Percentage
	1. Cranium	13	0.5
	2. Mandible	1	0.04
	3. Hyoid		
	4. Misc. Loose Incisor/Canine	2	0.1
	5. Misc. Loose Premolar/Molar	9	0.3
	6. Misc. Tooth Frags.	16	0.6
	7. Atlas		
	8. Axis		
	9. Cervical Vertebra (3-7)	12	0.4
	10. Thoracic Vertebra (1-14)	31	1.1
	11. Spinous Process	1	0.04
	12. Lumbar Vertebra (1-5)	2	0.1
	13. Sacrum	10	0.4
	14. Caudal Vertebra		
	15. Unident. Vertebra Frags.		
	16. Rib	16	0.6
	17. Sternum		
	18. Scapula	4	0.1
	19. Humerus	17	0.6
	20. Radius	4	0.1
	21. Ulna	1	0.04
	22. Radial Carpal	1	0.04
	23. Ulnar Carpal	1	0.04
	24. Internal Carpal	2	0.1
	25. Unciform Carpal	3	0.1
	26. Accessory Carpal		
	27. Fused 2nd/3rd Carpal	1	0.04
	28. Metacarpal	3	0.1
	29. Ischium		
	30. Ilium		
	31. Pubis		
	32. Innominate Frags.	2	0.1
	33. Femur	12	0.4
	34. Patella		
	35. Tibia	1	0.04
	36. Tibial Tarsal		
	37. Calcaneous		
	38. Lateral Malleolus	3	0.1
	39. Fused 2nd/3rd Tarsal	2	0.1
	40. Fused Central/4th Tarsal	2	0.1
	41. Metatarsal	1	0.04
	42. Metapodial Frags.		
	43. First Phalanx	7	0.2
	44. Second Phalanx	6	0.2
	45. Third Phalanx	3	0.1
	46. Inferior Sesamoid		
	47. Sesamoid	1	0.04
	48. Unident. Bone Frags.	2,657	93.3
	TOTAL =	2,847	100.2

NON-BISON FAUNAL REMAINS

Species	Element	Number
Clam	Valve	2
Canis sp.	Phalanx	1
Canis sp.	Tibia	1

TABLE 14: Calculation of Minimum Number of Individuals for Bison in Level 2.

Element	Side	Number	MNI
1. Metacarpal	2L 1R	3	2
2. Fused 2nd/3rd Carpal	1R	1	1
3. Ulnar Carpal	1L	1	1
4. Internal Carpal	1L 1R	2	1
5. Radial Carpal	1R	1	1
6. Unciform Carpal	2L 1R	3	2
7. Radius	1L 1R	2	1
8. Metatarsal	1L	1	1
9. Fused 2nd/3rd Tarsal	1R	1	1
10. Fused Central/4th Tarsal	1R	1	1
11. Calcaneous	1R	1	1
12. Tibia	1R	1	1

MNI = 2

discovered in level 2.

Feature 1-2 Stone Circle. This feature was only partially exposed during excavations of level 2 at the Amisk site. It is an arc of 10 boulders which crosses excavation unit B and the adjacent part of the north-south trench. The diameter of this feature is approximately 3 meters. Scattered in and about it are a number of fragmented bison bones, small cobbles and fire-cracked rocks. At the southern edge of the circle is a cluster of thoracic vertebrae. The size of the boulders and the diameter of the circle are similar to other stone circles in the Wanuskewin Heritage Park which have been identified as tipi rings (Walker, 1983). This particular feature differs in that it is rather densely populated with faunal remains and other artifacts. Walker (1983) reports that a tipi ring excavated in the Sunburn Tipi Ring site was almost devoid of artifacts.

Feature 2-2 Stone Circle. This feature is located at the southeast corner of excavation unit A (Figure 9). It was completely exposed during excavations of level 2 at the Amisk site. It is a roughly semi-circular band, about 1.5 m in diameter, of small to medium sized cobbles and fire-cracked rocks. No artifacts were found in the feature or the surrounding area. The possible function of this stone feature is unknown.

6.2.4 Summary. A variety of activities occurred in the

level 2 occupation of the Amisk site. The presence of a tipi ring indicates that this was a habitation area. Though no particular cooking features have been found the burned bone and fire-cracked rock indicate that cooking activities occurred within the site area. The presence of cores and tools and the relative dense accumulation of lithic detritus in excavation unit B are evidence of tool production in this part of the site. The map in Figure 12 indicates that this area and a spot near the centre of the north-south trench were the locations of the most dense accumulations of lithic artifacts in the excavated area. The high density of faunal remains in excavation unit C suggest that butchering activities occurred here. This is corroborated by the artifact density plot in Figure 13 which reveals a high concentration of faunal remains in the area of excavation unit C.

6.3 Level 3

6.3.1 Cultural Assemblage.

Planviews of artifact distributions are given in Figures 14 and 15.

Lithic Artifacts.

Debitage. Five hundred and twenty-one chipped stone

FIGURE 12

LEVEL 2
Density of Lithic Artifacts

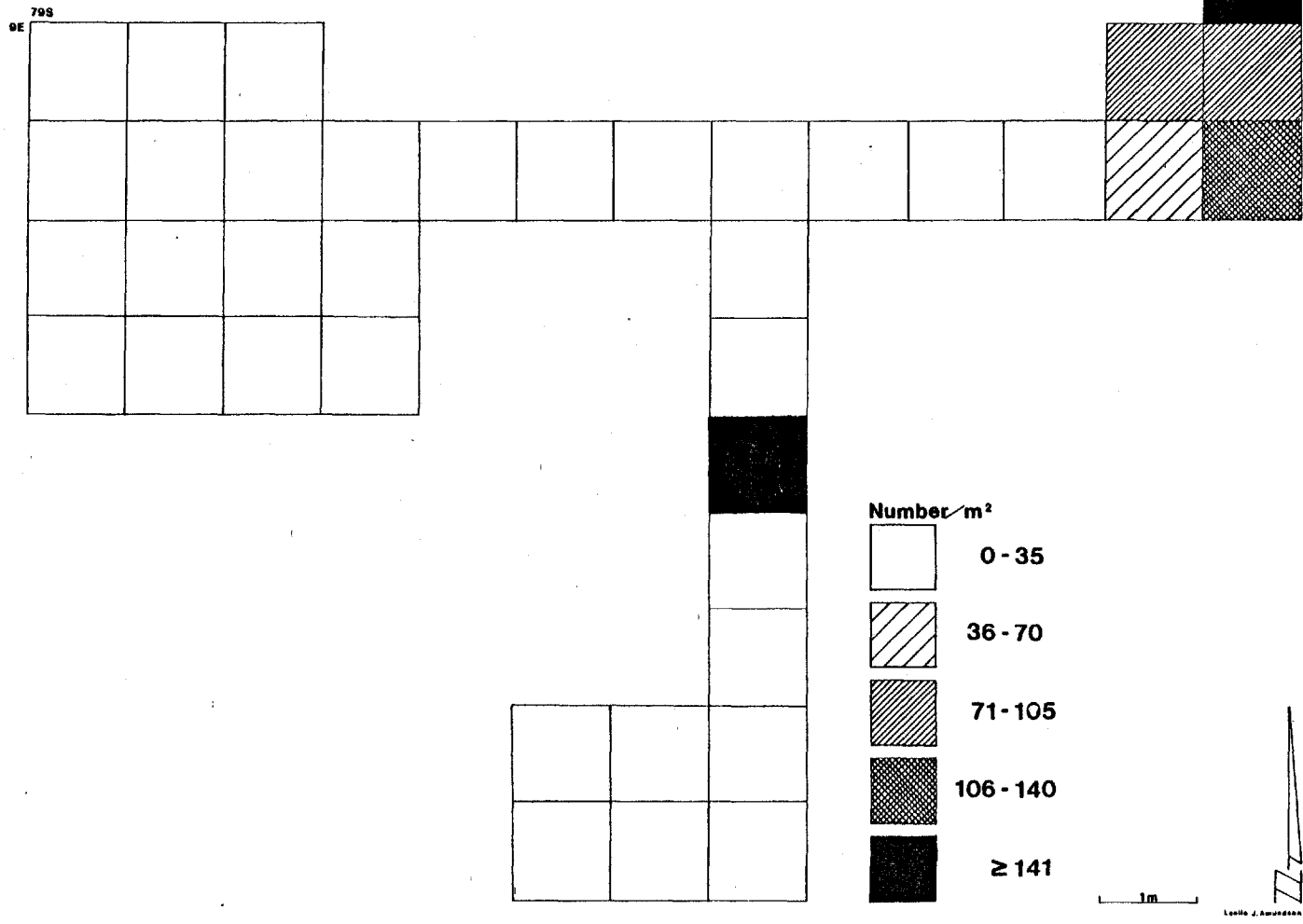


FIGURE 13

LEVEL 2

Density of Faunal Remains

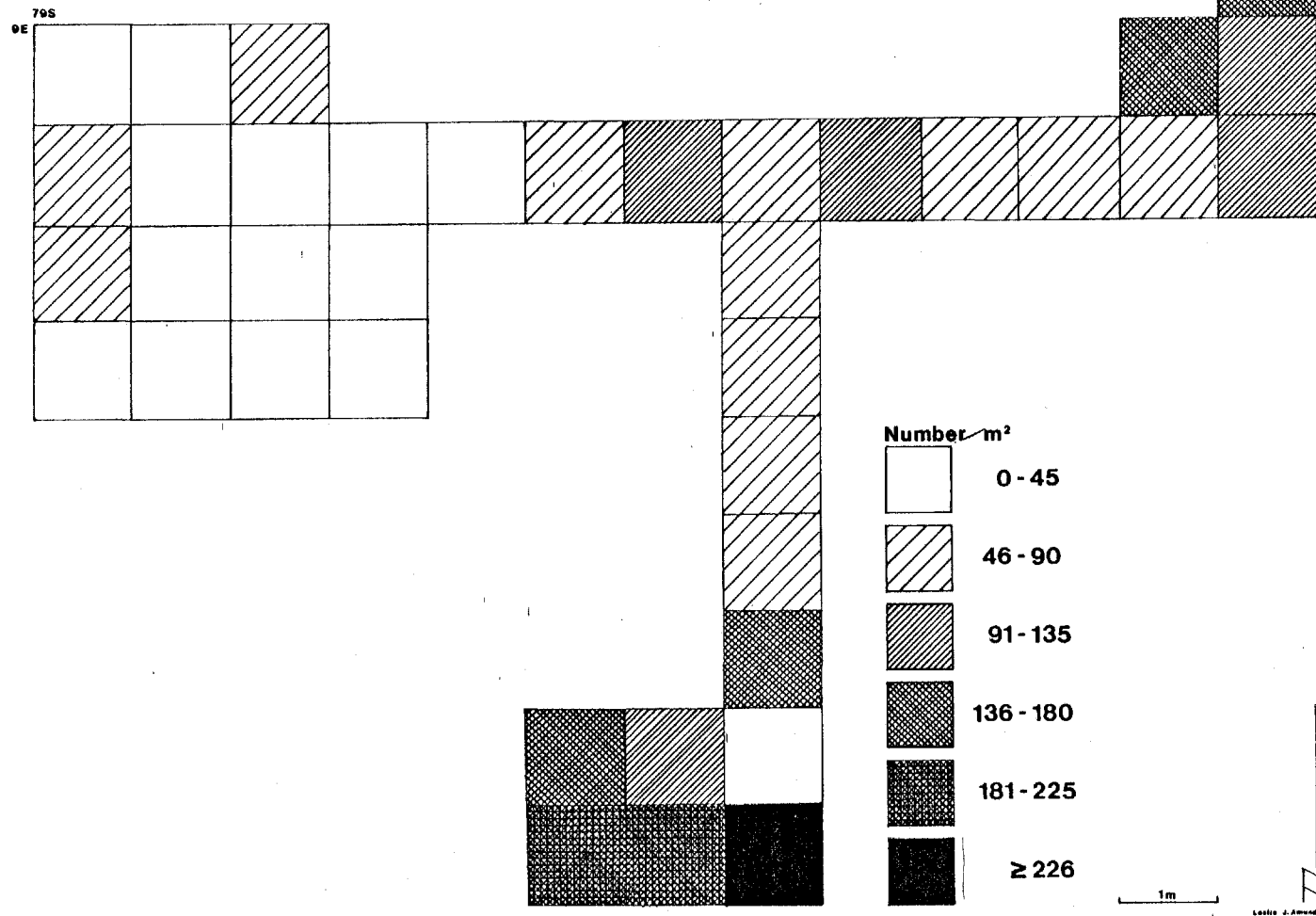


FIGURE 14

EXCAVATION UNIT A

LEVEL 3

- Flake
- Detritum
- ▨ Stone
- Endscraper
- Core
- ▨ Fire Cracked Rock
- Rock
- Bone
- Tooth
- Shell

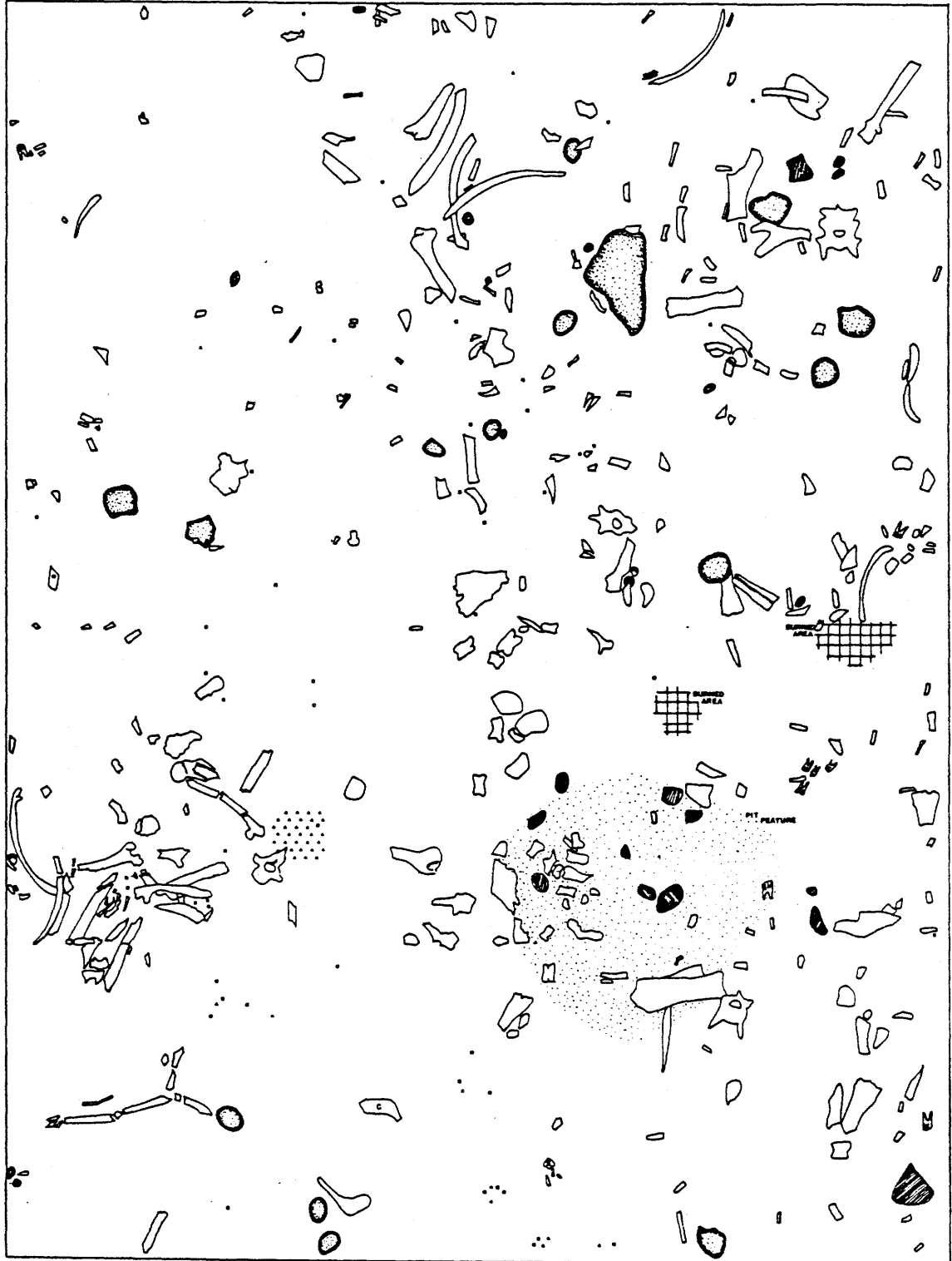
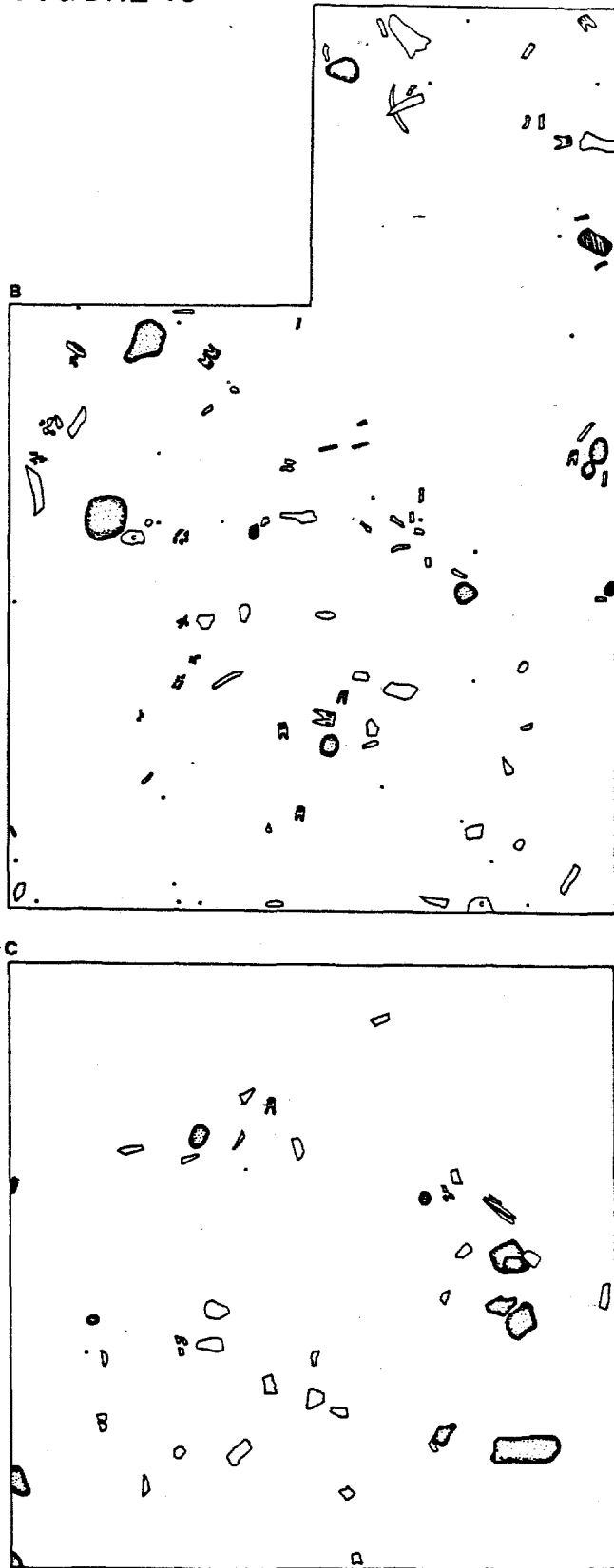
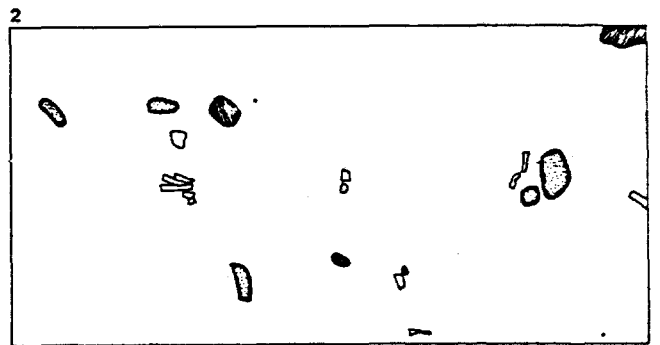
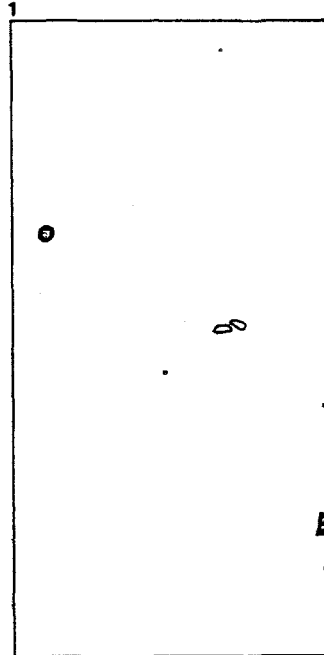


FIGURE 15



EXCAVATION UNITS B&C
AND
TEST UNITS 1&2
LEVEL 3

- Flake
- Debitage
- Core
- Fire Cracks
- Bone
- Stone
- Tooth



items were recovered during level 3 excavations at the Amisk site. Five hundred and thirteen or 98.5% are debitage of which 396 or 76% are shatter and 117 or 22.5% are flakes. These were found scattered throughout the excavated area and in a number of small concentrations.

Endscrapers. Four endscrapers were discovered in level 3. Two were found in excavation unit A and two were found in the north-south trench. Three of these are made of a very fine chalcedony. Each is so similar in color, texture, and translucence that one may infer that they are made of flakes from the same core. Each endscraper is, however, morphologically quite different. One, FbNp-17-812, is a large, thin, "teardrop" shaped flake with unifacial retouch on three sides and the striking platform intact on the proximal end. The ventral surface retains the bulb of percussion as well as percussion rings expanding distally. The dorsal surface has a number of irregular flake scars which are remnants of previous core reduction activities. Modification is restricted to the edges. The working edge angle is 60 degrees.

The second endscraper, FbNp-17-567, is a slightly skewed quadrilateral shape with unifacial retouch on three sides. The proximal end is broken transversely though it is not apparent whether this breakage occurred before or after the production of the endscraper. The flake on which it is made is thin and almost blade-like with parallel edges. Parallel

ridges on the dorsal surface of the endscraper indicate prior removal of similar long, narrow flakes from the core. The ventral surface has percussion rings expanding proximally. The angle of the working edge is 55 degrees.

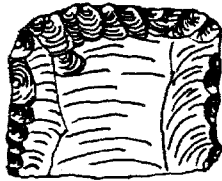
The third chalcedony endscraper, FbNp-17-4514, is very small. There appears to be three working edges on this tool. The distal end has been unifacially worked and is the main working edge. It has an angle of 60 degrees and is at the thickest part of the skewed, plano-convex profile of the tool. The proximal edge is straight and unifacially retouched. The right lateral edge is concave and has also been unifacially worked. The left lateral edge is unmodified. The dorsal surface of this endscraper is flat. Percussion rings which expand transversely from left to right can be seen on the ventral surface.

The fourth endscraper, FbNp-17-5252, is more crudely made on grey, fine-grained quartzite. The convex distal end has been unifacially worked and has an edge angle of 65 degrees. The right lateral edge is also convex and unifacially worked. The left lateral edge is concave and unmodified. The proximal end has been transversely broken, though, whether this occurred before or after the production of the endscraper cannot be determined. This endscraper is rather thick with a biplanar profile. The dorsal surface has a number of irregular flake scars. The ventral surface is relatively smooth. Three of these endscrapers are illustrated in Figure

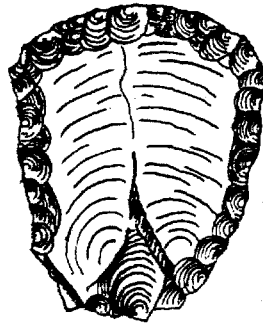
FIGURE 16
ARTIFACTS of LEVEL 3



a
Bone Awl



b



c



d

Endscrapers b-d



Leslie J. Amundson

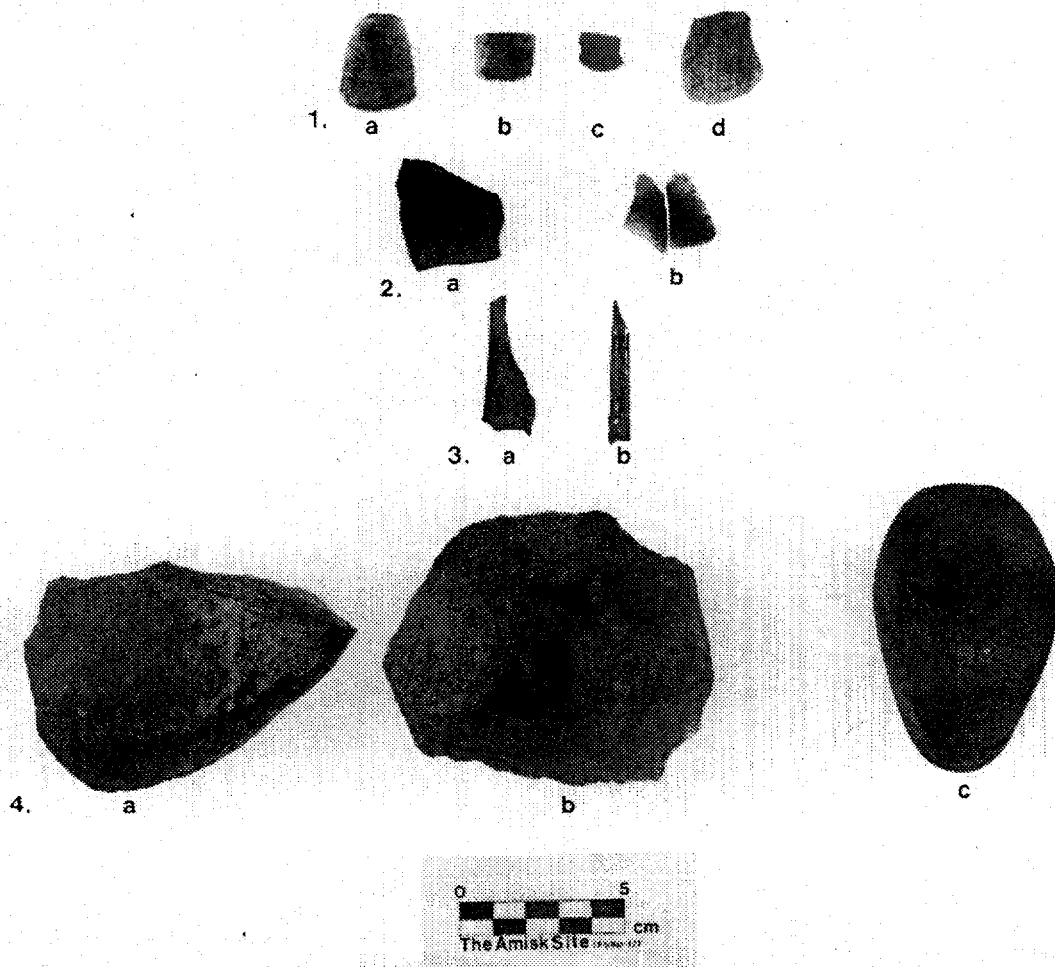


PLATE 10. Level 3 Tools and Cores

1. Endscrapers
2. a) Biface b) Retouched Flake
3. Bone Tools
4. a & b) Cores c) Hammerstone

16 and all are shown in Plate 10, row 1. The metric attributes of these items is presented in Table 15.

TABLE 15: Endscraper Metric Attributes in mm for Level 3.

SPECIMEN # (FbNp-17-)	MAXIMUM LENGTH	MAXIMUM WIDTH	MAXIMUM THICKNESS	DISTAL EDGE ANGLE
567	14.5	18.6	3.0	55
812	29.4	23.9	4.9	60
4514	11.7	13.6	3.9	60
5252	27.8	24.6	8.0	65

Bifacial Knives. One incomplete biface made on a poor piece of brown chert was found in square 79S, 9E in the northwest corner of excavation unit A (Figure 14). FbNp-17-464 is a fragment of an ovate biface which was broken longitudinally and transversely at both ends. What remains is a quadrilateral shaped piece with part of the working edge intact. It is finely, bifacially worked at the edge but imperfections and cleavages in the material prevented thinning across the entire surface of the tool. The dulled and use damaged cutting edge indicates that this knife saw a great deal of use. This fragment is large enough to have been used even after the original tool was broken. It is shown in Plate 10, row 2a.

Retouched Flakes. There were two fragments of the same retouched flake recovered from square 80S, 14E which is near the west end of the east-west trench. It is an irregularly shaped flake of fine brown chalcedony; the same material from which three of the endscrapers described above were produced.

The bulb of percussion and percussion rings are preserved on the ventral surface. A remnant of the striking platform is present on the proximal end of the flake. The dorsal surface displays several irregular flake scars. Small portions of two edges are unifacially retouched. This item is shown in Plate 10, row 2b.

Cores. Two crystalline quartz cores were found in adjacent squares, 79S, 21E and 80S, 21E, at the east side of excavation unit B (Figure 15), during level 3 excavations at the Amisk site. Both are large, crude cores. Each has a single striking platform with an average angle of 75 degrees. Several irregular flakes have been removed from the face of each core. One core, FbNp-17-1120, is 97.6 mm wide, 83.3 mm long, and 66.6 mm in breadth with a striking platform angle of 70 degrees. The other, FbNp-17-4735, is 103.6 mm wide, 57.8 mm long, and 71.4 mm in breadth with a striking platform angle of 80 degrees. Both cores are shown in Plate 10, row 4 a and b.

Hammerstones. FbNp-17-4516 is a palm-sized hammerstone which was found in square 82S, 16E at the north end of the north-south trench. This roughly egg shaped cobble is battered and chipped at both ends. It was found broken in two pieces as a result of fire cracking. This item is illustrated in Plate 10, row 4c.

Lithic Raw Materials. The lithic assemblage of the

level 3 occupation at the Amisk site is composed of 11 lithic raw material types. Nine of these are local varieties and two are exotic. The local varieties include, in order of decreasing frequency by number of items: quartz; chert; fine-grained quartzite; medium-grained quartzite; fine-grained igneous; Swan River chert; coarse-grained quartzite; petrified wood; and fused shale. The exotic varieties are chalcedony and welded volcanic tuff. Details of the lithic assemblage are presented in Tables 16, 17, and 18.

Fire-Cracked Rock. Forty-three pieces of fire-cracked rock with a total weight of 9,027.7 grams and an average weight of 209.9 grams were found throughout the excavated area of level 3. Several are associated with a pit feature in excavation unit A (Figure 14).

Bone Tools. Two polished bone items were recovered from level 3 at the Amisk site. One, FbNp-17-1180, (Figure 16, a), is a small sliver of bone 44.2 mm long and 6.9 mm wide which has been deliberately pointed at one end and shows a high degree of polish. It is a typical bone awl. It was found in square 80S, 9E which is at the centre of the west edge of excavation unit A (Figure 14). The other bone tool, FbNp-17-6576, was found in square 102S, 16E in test unit 2 (Figure 15) which is near the southern edge of the Amisk site area. It is a roughly triangular shaped sliver of bone 41.4 mm long and 16.7 mm wide. The narrow end of the sliver is highly polished with a concave edge that appears to have been

TABLE 16: Frequencies of Lithic Materials by Number for Level 3

MATERIAL	FORM								TOTALS					
	Shatter		Flake		Endscraper		Core		Biface		Retouched Flake			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
Quartz	185	46.7	18	15.4			2	100.0			205	39.3		
Chert	71	17.9	39	33.3					1	100.0	111	21.3		
Fine-Grained Quartzite	56	14.1	31	26.5	1	25.0					88	16.9		
Medium-Grained Quartzite	31	7.8	2	1.7							33	6.3		
Chalcedony	5	1.3	18	15.4	3	75.0				1	100.0	27	5.2	
Fine-Grained Igneous	21	5.3	4	3.4							25	4.8		
Swan River Chert	12	3.0	3	2.6							15	2.9		
Volcanic Tuff	5	1.3	2	1.7							7	1.3		
Coarse-Grained Quartzite	6	1.5									6	1.2		
Petrified Wood	2	0.5									2	0.4		
Shale	2	0.5									2	0.4		
TOTALS	396	99.9	117	100.0	4	100.0	2	100.0	1	100.0	1	100.0	521	100.0

TABLE 17: Frequencies of Lithic Materials by Weight (in grams) for Level 3

MATERIAL	FORM										TOTALS			
	Shatter		Core		Flake		Biface		Endscraper		Retouched Flake		Wt.	%
	Wt.	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%
Quartz	336.2	25.5	881.3	100.0	19.3	4.0							1,236.8	45.7
Fine-Grained Igneous	117.5	8.9			281.0	58.2							398.5	14.7
Fine-Grained Quartz	280.3	21.3			94.5	19.5			6.6	53.7			381.4	14.1
Chert	179.8	13.7			42.2	8.7	12.4	100.0					234.4	8.7
Medium-Grained Quartzite	141.2	10.7			29.6	6.1							170.8	6.3
Swan River Chert	96.5	7.3			1.8	0.4							98.3	3.6
Coarse-Grained Quartzite	98.8	7.4											98.0	3.6
Volcanic Tuff	32.5	2.5			0.3	0.1							32.8	1.2
Chalcedony	6.3	0.5			13.8	2.9			5.7	46.3	2.0	100.0	27.8	1.0
Petrified Wood	16.7	1.3											16.7	0.6
Shale	12.2	1.0											12.2	0.5
TOTALS	1,317.2	100.1	881.3	100.0	482.5	99.9	12.4	100.0	12.3	100.0	2.0	100.0	2,707.7	100.0

TABLE 18: Frequencies of Lithic Forms by Number and Weight for
Level 3

FORM	NUMBER	PERCENTAGE	WEIGHT	PERCENTAGE
Shatter	396	76.00	1,317.2	48.60
Flake	117	22.50	482.5	17.80
Endscraper	4	0.80	12.3	0.50
Core	2	0.40	881.3	32.50
Bifacial Knife	1	0.20	12.4	0.50
Retouched Flake	1	0.20	2.0	0.10
TOTAL	521	100.10	2,707.7	100.00

flaked. Both these items are shown in Plate 10, row 3.

6.3.2 Faunal Assemblage. Bone and tooth remains are well preserved in level 3. Five species are represented in the faunal assemblage recovered here. Bison is predominant with 99.6% of the total bone inventory. The NISP for bison is 8,225 of which 1,508 or 18.3% are identifiable fragments. The remaining 6,717 pieces or 81.7% are comminuted bone of which 103 or 1.7% are burned. The NISP for clam (Unio sp.) is 15 and for Canis sp. it is nine. Seven bird bone fragments were found in level 3 as well as two ground squirrel bone fragments which may be intrusive. The total inventory of bone, complete and fragmentary, is presented in Table 19. The MNI for bison is four. Calculation of the MNI is displayed in Table 20.

6.3.3 Features.

Feature 1-3 Pit. This basin shaped pit was located at the junction of four excavation squares in the southeast section of excavation unit A (Figure 14). It is roughly circular with a diameter of one meter and a maximum depth of 15-20 cm. The pit is filled with sands that are coarser than the surrounding sedimentary matrix. Scattered in and about the pit are several fire-cracked rocks and a number of fragments of bison bone. There is no apparent fire reddening of the soil around the pit. It may be the remnant of a cooking pit similar to those described by Frison (1978):

A general interpretation of these features is that they were

TABLE 19: Total Inventory of Faunal Remains, Complete and Fragmentary for Level 3.

BISON:	Element	Number	Percentage
	1. Cranium	835	10.2
	2. Mandible	9	0.1
	3. Hyoid		
	4. Misc. Loose Incisor/Canine	7	0.1
	5. Misc. Loose Premolar/Molar	56	0.7
	6. Misc. Tooth Frags.	22	0.3
	7. Atlas	31	0.4
	8. Axis	50	0.6
	9. Cervical Vertebra (3-7)	8	0.1
	10. Thoracic Vertebra (1-14)	33	0.4
	11. Spinous Process	22	0.3
	12. Lumbar Vertebra (1-5)	10	0.1
	13. Sacrum	18	0.2
	14. Caudal Vertebra		
	15. Unident. Vertebra Frags.	9	0.1
	16. Rib	194	2.3
	17. Sternum		
	18. Scapula	27	0.3
	19. Humerus	9	0.1
	20. Radius	4	0.05
	21. Ulna		
	22. Radial Carpal		
	23. Ulnar Carpal	1	0.01
	24. Internal Carpal	4	0.5
	25. Unciform Carpal		
	26. Accessory Carpal	2	0.02
	27. Fused 2nd/3rd Carpal	3	0.04
	28. Metacarpal	54	0.7
	29. Ischium	2	0.02
	30. Ilium	7	0.1
	31. Pubis		
	32. Innominate Frags.	2	0.02
	33. Femur	5	0.06
	34. Patella	1	0.01
	35. Tibia	5	0.06
	36. Tibial Tarsal	1	0.01
	37. Calcaneous	3	0.04
	38. Lateral Malleolus	5	0.06
	39. Fused 2nd/3rd Tarsal	2	0.02
	40. Fused Central/4th Tarsal	6	0.07
	41. Metatarsal	4	0.05
	42. Metapodial Frags.	2	0.02
	43. First Phalanx	17	0.2
	44. Second Phalanx	14	0.2
	45. Third Phalanx	19	0.2
	46. Inferior Sesamoid	1	0.01
	47. Sesamoid	4	0.05
	48. Unident. Bone Frags.	6,717	81.7
	TOTAL =	8,225	100.1

NON-BISON FAUNAL REMAINS

Species	Element	Number
Clam	Valve	15
Canis sp.	Rib Frag.	7
Canis sp.	Maxillary Premolar	2
Bird	Humerus	2
Bird	Femur	1
Bird	Bone Frag.	4
Ground Squirrel	Tooth	1
Ground Squirrel	Bone Frag.	2

TABLE 20: Calculation of Minimum Number of Individuals for Bison in Level 3.

Element	Side	Number	MNI
1. Metacarpal	2L 1R	3	2
2. Fused 2nd/3rd Carpal	1L 1R	2	1
3. Ulnar Carpal	1R	1	1
4. Internal Carpal	4R	4	4
5. Fused Central/4th Carpal	4L 1R	2	4
6. Axis	--	1	1
7. Cervical Vertebra (3-7)	--	2	1
8. Metatarsal	1L 2R	3	2
9. Fused 2nd/3rd Tarsal	2L	2	2
10. Lateral Malleolus	3L 3R	3	3
11. Tibial Tarsal	1L	1	1
12. Calcaneous	1R	1	1
13. Tibia	2L 1R	3	2

MNI = 4

used for cooking food products. Stones were placed on a bed of hot coals in the pits; when heated the stones served as a source of heat for cooking. Whatever was to be cooked could have been put in a green hide, animal paunch, or fibre bag, placed directly on the hot stones, covered with earth, and left for a period of time....The heat usually fractured the stones so that they were of no further value and another pit was dug or else the old one was cleaned out and fresh rock was used. (Frison 1978: 355).

The feature at the Amisk site, however, has no evidence of charcoal or burning in the pit itself. Perhaps the stones were heated on two small fires, features 2-3 and 3-3, just north of the pit. The relatively small number of fire-cracked rocks suggests that the pit was used only once.

Feature 2-3 Hearth. This is a small burned area in square 81S, 11E 20 cm north of the cooking pit described above (Figure 14). It is a roughly circular area of fire-reddened and blackened soil and charcoal with a diameter of 25 cm and a maximum depth of 5 cm. This feature may be the remnant of a fire used to heat stones for the adjacent cooking pit.

Feature 3-3 Hearth. This is another burned area similar to feature 2-3. It is in the same excavation square 40 cm eastnortheast of the other hearth. It is an oblong area of fire-reddened and blackened soil which is about 35 cm long in an east-west direction and 20 cm wide in a north-south direction. This feature may also be the remains of a fire

used to heat cooking stones.

Feature 4-3 Chipping Station. This is a roughly circular concentration of artifacts with a diameter of 15 cm containing about 60 quartz flakes. It was discovered in square 81S, 9E 60 cm west of the cooking pit (feature 1-3). Immediately east of this chipping station is a cluster of bison ribs and thoracic vertebrae in which one of the finely made endscrapers described previously was found.

6.3.4 Summary. The level 3 occupation at the Amisk site was the site of food processing, cooking and tool making. Fragmented bison bone, some scattered and some in non-articulated clusters, indicate butchering and bone breaking activities on carcasses transported here from a kill site of unknown location. The occurrence of butchering is further supported by the presence of cut marks on some of the bone. Cooking is indicated by the presence of feature 1-3. Core reduction and tool making activities are suggested by the scattered lithic debitage and by the chipping station feature. Maps of artifact density (Figures 17 and 18) in the excavated area indicate that faunal remains are most densely accumulated near the middle of the east-west trench. Lithic artifacts are concentrated in the southwest corner of excavation unit A in the vicinity of the chipping station.

6.4 Level 4

FIGURE 17

LEVEL 3
Density of Lithic Artifacts

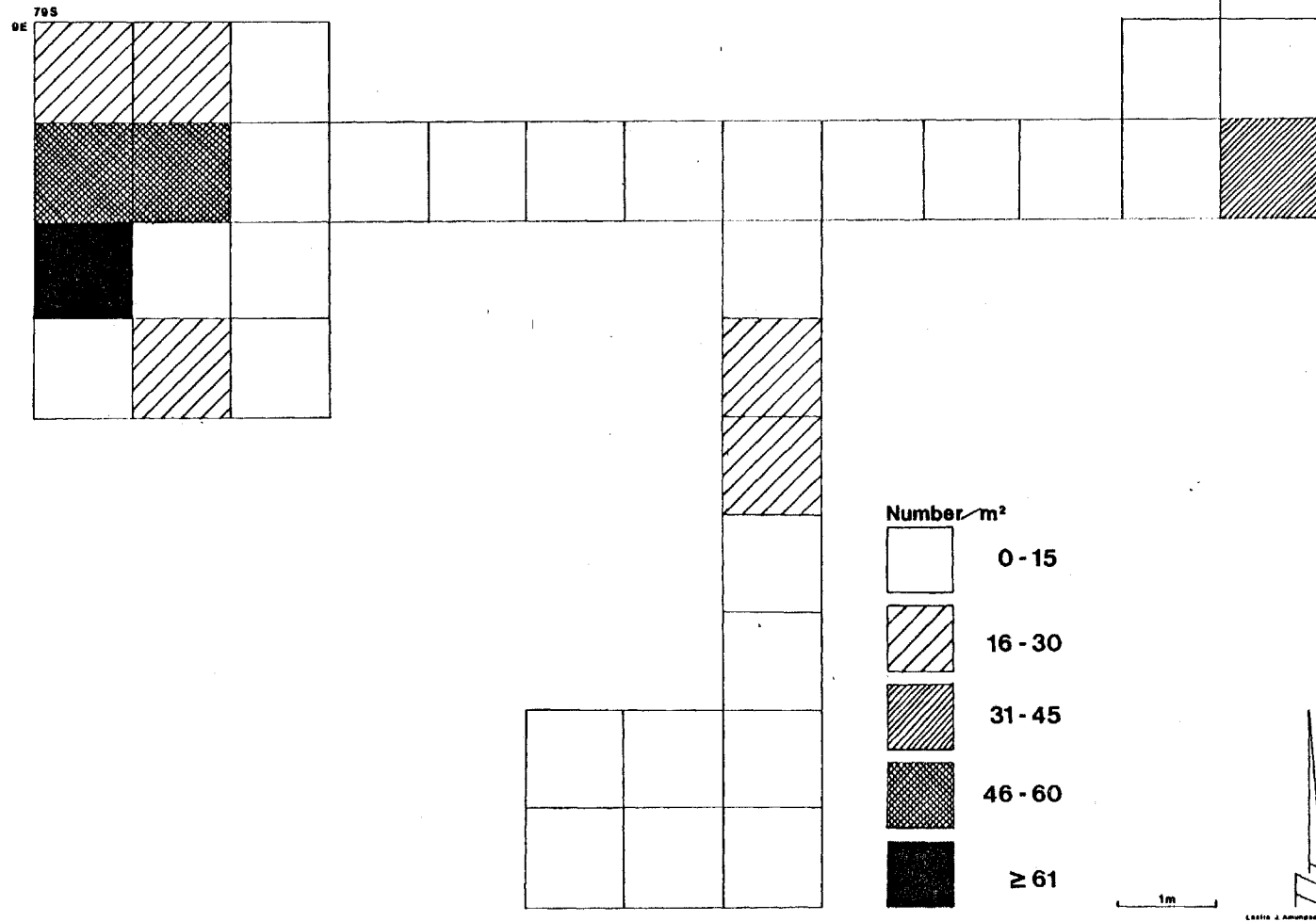
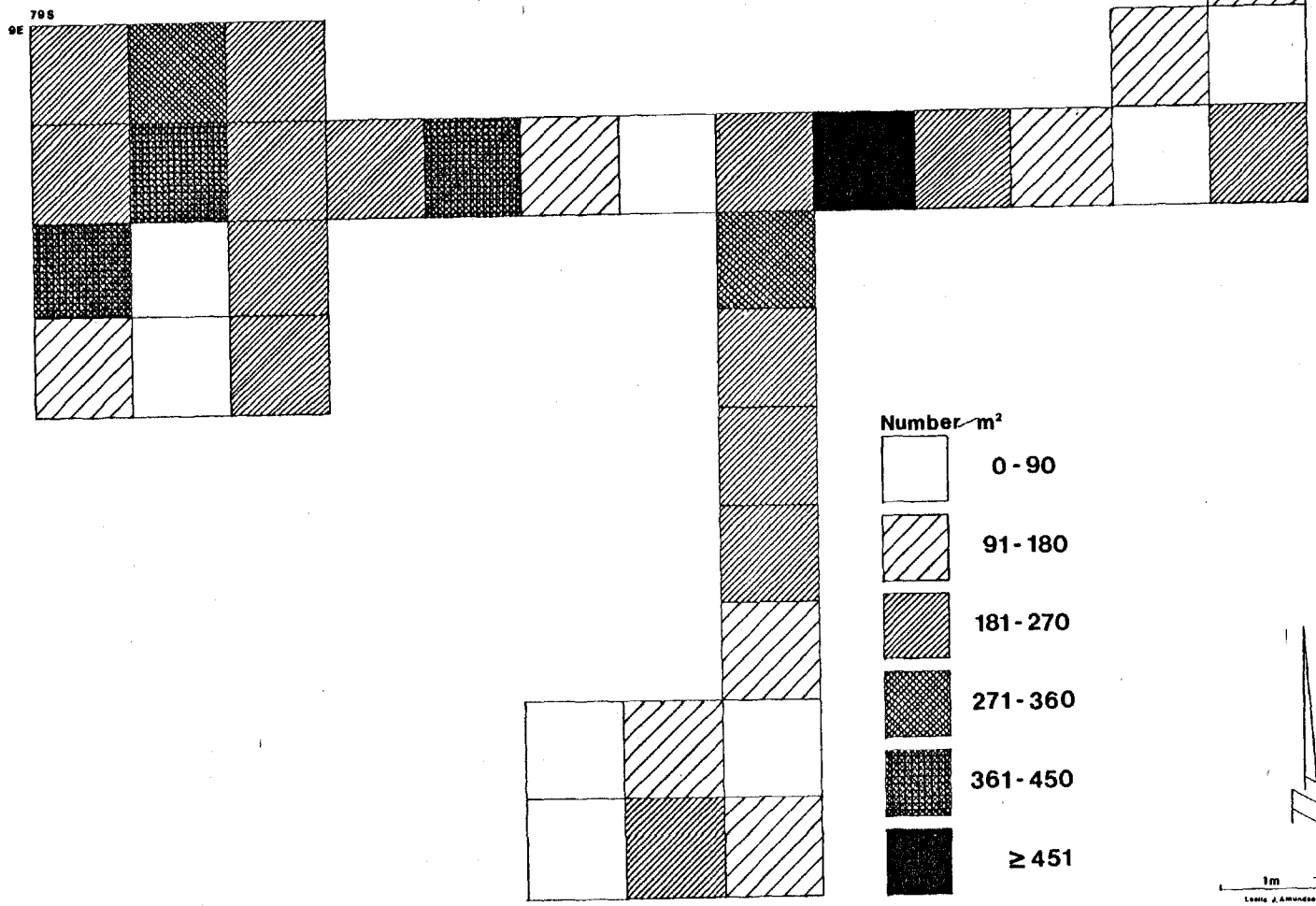


FIGURE 18

LEVEL 3

Density of Faunal Remains



6.4.1 Cultural Assemblage.

Planviews of artifact distributions are given in Figures 19 and 20.

Lithic Artifacts.

Debitage. Four hundred and fifteen lithic artifacts were recovered from level 4 at the Amisk site. Of these 397 or 95.7% are debitage; 187 (45.1%) are flakes and 210 (50.6%) are shatter. They are scattered across most of the excavated area.

Projectile Points. Seven projectile points were found in level 4. Five of these have been broken. One is missing its base and part of the tip. Another has been broken both longitudinally and transversely leaving only one half of the shoulder and base area. Two are missing half of the base and the tip portions. The remaining one is complete except for a broken tip. Of the two complete points, one has been reworked at the tip and the other shows no signs of repair. Six of these are identifiable as Oxbow complex projectile points. They match Dyck's (1977) description:

The Oxbow type of projectile point is side-notched with the notches straddling the widest part of the blade, and basally thinned with thinning flakes extending on both faces up to or slightly beyond a line joining the distal juncture of the notches. Thinning usually produces a pronounced basal concavity (Dyck, 1977,

FIGURE 19

EXCAVATION UNIT A
LEVEL 4

- ▲ Projectile Point
- Flake
- Detritus
- Biface
- Fire Cracked Rock
- Rock
- Bone
- Tooth
- Shell

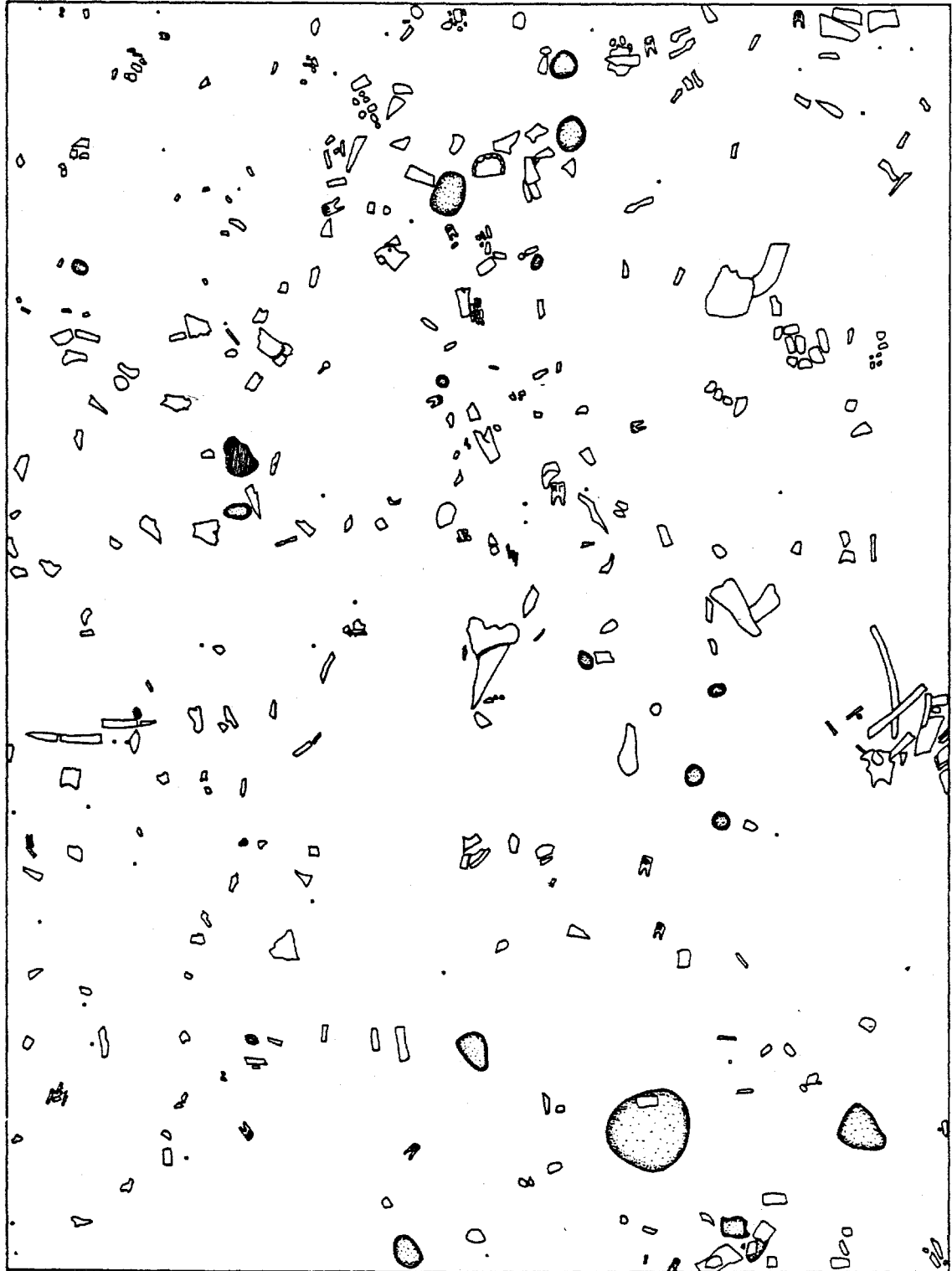
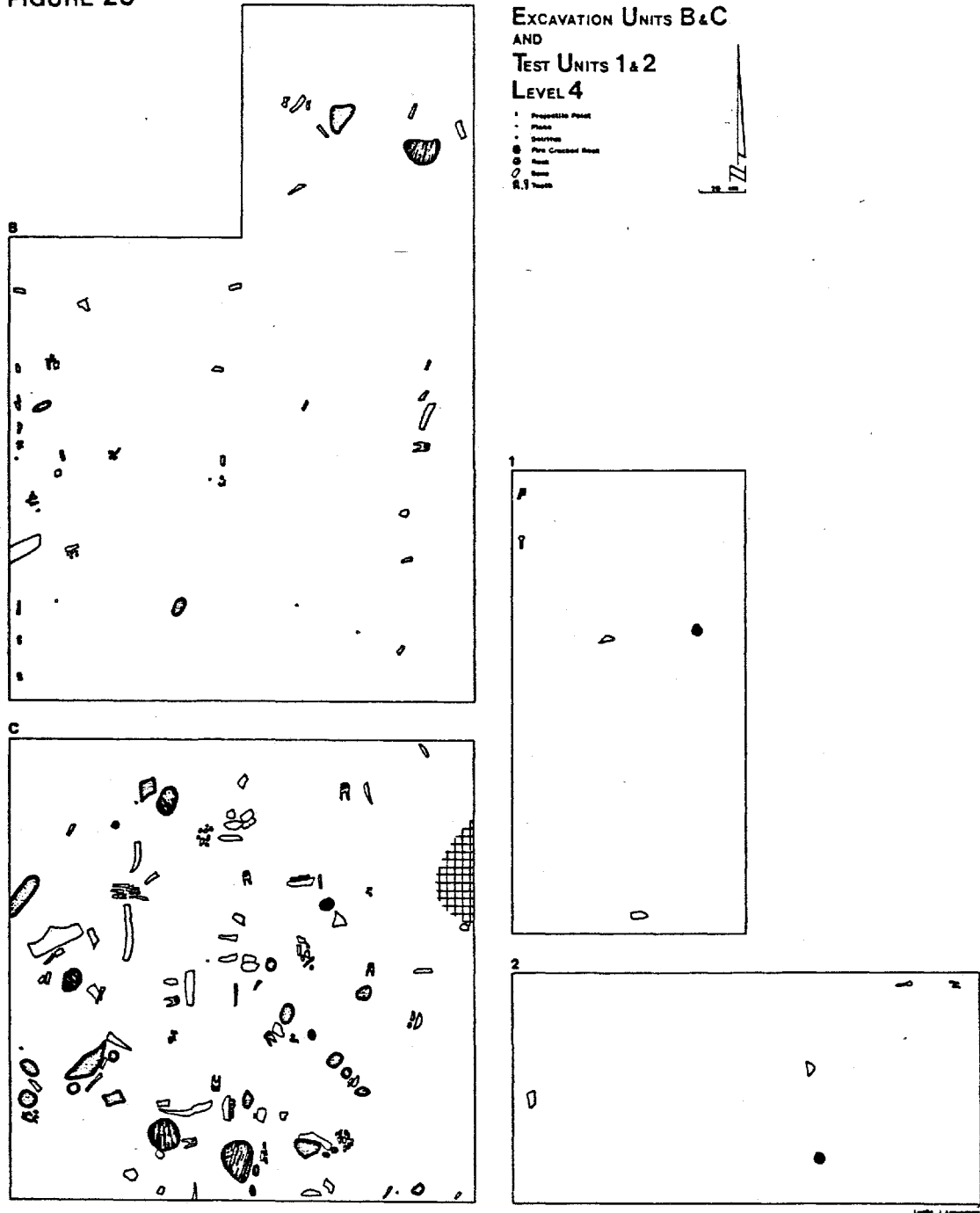


FIGURE 20



6).

The point with the missing base cannot be definitely identified but is assumed to be an Oxbow point as well. Two of these points were found in the vicinity of a hearth feature in excavation unit C (Figure 20). Two were in excavation unit A and the remaining three were recovered from the east-west trench.

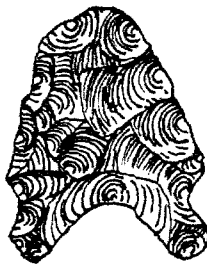
Chert appears to have been preferred for the production of projectile points in level 4 with four of seven being made from this material. Two are made from quartzite and one is made from welded volcanic tuff.

Any variance in morphology among these points is of degree rather than kind. All have convex lateral edges with the maximum width just distal to the shoulders. Features showing variability are the depth of the side-notches and the depth of the basal concavity. Projectile point metric attributes are presented in Table 21. Some of these projectile points are illustrated in Figure 21 and shown in Plate 11, row 1.

FIGURE 21: ARTIFACTS of LEVEL 4



a



b



c



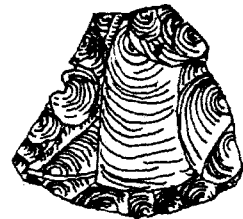
d



e



f



g

Projectile Points: a; b; c
Preform: d
Endscrapers: e; f; g



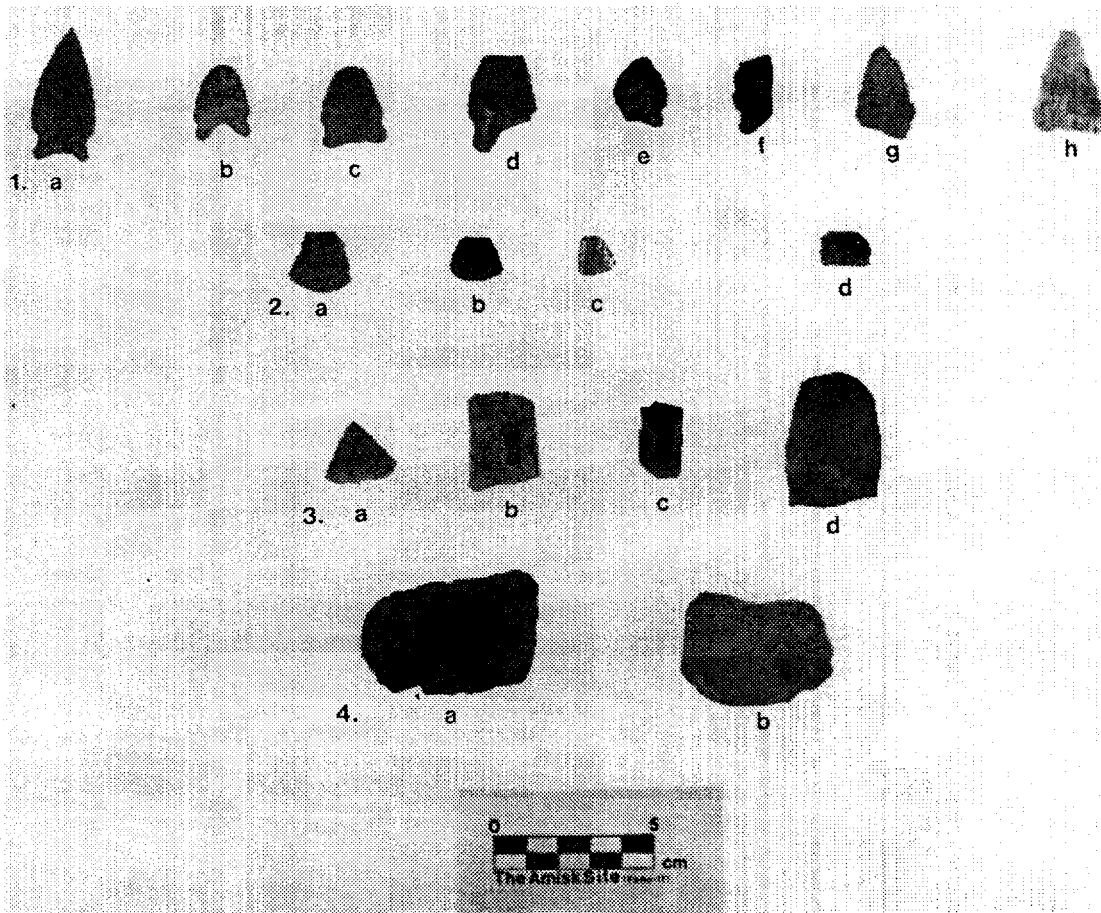


PLATE 11. Level 4 Tools and Cores
1. Projectile Points
2. Endscrapers
3. Bifaces
4. Cores

TABLE 21: Projectile Point Metric Attributes in mm for Level 4.

SPECIMEN # (FbNp-17-)	MAXIMUM LENGTH	MAXIMUM WIDTH	MAXIMUM THICKNESS	BASAL WIDTH	LEFT NOTCH WIDTH	RIGHT NOTCH WIDTH
4959	NA	21.4	6.5	NA	NA	7.2
5055	42.3	20.4	6.9	17.8	6.8	7.6
5140	23.0	18.0	4.9	17.5	6.0	3.0
5361	NA	19.0	5.0	NA	NA	NA
6122	NA	21.0	4.5	21.0	4.6	5.6
6137	20.9	17.8	5.3	NA	NA	3.3
6530	NA	NA	4.5	NA	5.5	NA
MEAN	28.63	19.96	5.37	18.77	5.73	5.34
STANDARD DEVIATION	9.49	1.27	0.89	1.58	0.80	1.91

Preforms. One item from level 4 at the Amisk site is considered to be a projectile point preform or blank. This preform, FbNp-17-5014, was found in square 80S, 20E which is at the southwest corner of excavation unit B (Figure 20). It is a triangular biface 32.8 mm long and 22 mm wide. The irregular edges of this item suggest it was unfinished. This is possibly due to imperfections in the piece of medium-grained quartzite from which it was made. A number of hinge fractures on both faces leave the centre a relatively thick 6.7 mm. From this it can be inferred that the maker had difficulty thinning the piece and discarded it. This item is shown in Plate 11, row 1d and is illustrated in Figure 21, d.

Endscrapers. The three endscrapers recovered from occupation level 4 at the Amisk site are consistent in morphology with those in the Oxbow complex assemblage at the Long Creek site described by Wettlaufer and Mayer-Dakes (1960). They are small, triangular unifaces with plano-convex

profiles. The average angle of the working edge is 63.3 degrees. They range in length from 12.4 mm to 19.3 mm; in width from 12.4 mm to 20 mm; and in thickness from 3.4 mm to 5.8 mm. Two display pronounced dorsal ridges while the third has a flat dorsal surface. One of these endscrapers is made of brown chalcedony and the other two are made of chert. One endscraper was discovered in square 82S, 10E which is at the centre of the south edge of excavation unit A (Figure 20). The remaining two were found near the middle of the north-south trench. These items are illustrated in Figure 21 and in Plate 11, row 2 a-c.

Bifacial Knives. One incomplete biface was recovered from level 4. FbNp-17-2179 is a fragment of a large ovate biface made from Swan River chert. It has been broken both longitudinally and transversely. The transversely fractured edge was unifacially reworked to make a sidescraper. This tool is 42.9 mm long, 30.3 mm wide, and 9.3 mm thick. It was found in square 82S, 9E at the southwest corner of excavation unit A (Figure 19). This item is shown in Plate 11, row 3a.

Sidescrapers. One incomplete uniface, FbNp-17-5014, was found in square 83S, 16E which is near the middle of the north-south trench. It is a small fragment from what appears to be an ovate uniface but has been broken both transversely and longitudinally. No repair has been done on the broken edges so it is assumed that this item was discarded. It is made from a fine piece of chert. This uniface is shown in

Plate 11, row 2d.

Cores. Three cores were found in level 4 at the Amisk site. Two of these were in close proximity to the hearth feature in excavation unit C (Figure 20). One was found near the middle of the north-south trench. Each core has a single striking platform with an average angle of 78.3 degrees. A number of long, narrow flakes have been removed from one face of each core. The core in the middle of the north-south trench is very small while the other two are medium sized. The cores are of three different lithic materials including Swan River chert, fine-grained quartzite and coarse-grained quartzite. They are shown in Plate 11, row 4.

Retouched Flakes. Two retouched flakes were found in level 4. One was located in square 79S, 11E in the northeast corner of excavation unit A (Figure 19). The other is from the middle of the east-west trench. Both are made of grey fine-grained quartzite. One is triangular in form with unifacial retouch along one edge. The other is roughly rectangular with unifacial retouch on parallel sides. These items are shown in Plate 11, row 3 b and c.

Lithic Raw Materials. The lithic assemblage of level 4 at the Amisk site is composed of 10 raw material types. Eight of these, including fine-grained quartzite, chert, medium-grained quartzite, quartz, Swan River chert, coarse-grained quartzite, fine-grained igneous and jasper,

given here in order of decreasing frequency by number of items, are local varieties. Two lithic raw material types, chalcedony and welded volcanic tuff, are exotic. Details of the lithic assemblage are presented in Tables 22, 23 and 24.

Fire-Cracked Rock. Twenty-four pieces of fire-cracked rock with a total weight of 15,288 grams and an average weight of 637 grams were scattered throughout the excavated area.

6.4.2 Faunal Assemblage. Preservation of bone in the fourth occupation level at the Amisk site is excellent. This is demonstrated by the discovery of a bison horn core, a skeletal element which is especially prone to decomposition. Of the five species represented in the faunal remains recovered from level 4 at the Amisk site, bison is predominant with 99.7% of the total bone inventory and an NISP of 8,064. Of these 436 (5.6%) are identifiable fragments while 7,628 (94.6%) are comminuted bone. 4.6% of the comminuted bone is burned. The next most common remains are those of clam (Unio sp.) with an NISP of 12. The NISP for Canis sp. is 10. Ground squirrel remains number three. These, however, may be intrusive. Castor canadensis (beaver) is represented by a single ulna fragment. The MNI for bison in this level is four. Calculation of the MNI is presented in Table 26. The complete inventory of bone, complete and fragmentary is given in Table 25.

6.4.3 Features.

TABLE 22: Frequencies of Lithic Materials by Number for Level 4

MATERIAL	FORM										TOTALS									
	Shatter		Flake		Point		Core		Endscraper		Retouched Flake		Biface		Preform		Uniface		No.	%
No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.		
Fine-Grained Quartzite	53	25.2	69	36.9	1	14.3	1	33.3			2	100.0			1	100.0			127	30.6
Chert	53	25.2	44	23.5	4	57.1			2	66.7							1	100.0	104	25.1
Chalcedony	6	2.9	37	19.8					1	33.3									44	10.7
Medium-Grained Quartzite	17	8.1	24	12.8	1	14.3	1	33.3											43	10.4
Quartz	40	19.0	2	1.1															42	10.1
Swan River Chert	21	10.0	6	3.2									1	100.0					28	6.7
Coarse-Grained Quartzite	13	6.2	1	0.5	1	14.3	1	33.3											15	3.6
Fine-Grained Igneous	4	1.9	1	0.5															5	1.2
Volcanic Tuff	3	1.4	1	0.5															5	1.2
Jasper			2	1.1															2	0.5
TOTALS	210	99.9	187	99.9	7	100.0	3	99.9	3	100.0	2	100.0	1	100.0	1	100.0	1	100.0	415	100.0

TABLE 23: Frequencies of Lithic Materials by Weight (in grams) for Level 4

MATERIAL	FORM														TOTALS					
	Shatter		Flake		Core		Point		Biface		Retouched Flake		Preform		Endscraper		Uniface		Wt.	%
	Wt.	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%		
Fine-Grained Quartzite	220.2	24.20	73.2	35.10	67.0	50.60	2.1	12.40			6.4	100.00	3.0	100.00					372.8	28.70
Swan River Chert	179.7	19.70	16.8	8.00					16.3	100.00									212.8	16.40
Chert	170.3	18.70	30.1	14.40			8.1	47.60							3.0	83.30	1.2	100.00	212.7	16.40
Quartz	192.7	21.20	4.4	2.10															197.1	15.20
Coarse-Grained Quartzite	74.2	8.20	24.5	11.70	60.1	45.40													158.8	12.20
Medium-Grained Quartzite	43.8	4.80	32.3	15.40	5.3	4.00	5.3	31.20											86.6	6.70
Chalcedony	16.0	1.80	14.3	6.80							0.6	16.70							30.9	2.40
Fine-Grained Igneous	12.9	1.40	10.4	5.00															23.3	1.80
Volcanic Tuff	0.4	0.04	1.1	0.50			1.5	8.80											3.0	0.20
Jasper			1.8	0.90															1.8	0.10
TOTALS	910.2	100.04	208.8	99.90	132.4	100.00	17.0	100.00	16.3	100.00	6.4	100.00	3.9	100.00	3.6	100.00	1.2	100.00	1,299.8	100.10

TABLE 24: Frequencies of Lithic Forms by Number and Weight for
Level 4

FORM	NUMBER	PERCENTAGE	WEIGHT	PERCENTAGE
Shatter	210	50.60	910.2	70.00
Flake	187	45.10	208.8	16.10
Projectile Point	7	1.70	17.0	1.30
Core	3	0.70	132.4	10.20
Endscraper	3	0.70	3.6	0.30
Retouched Flake	2	0.50	6.4	0.50
Bifacial Knife	1	0.20	16.3	1.30
Preform	1	0.20	3.9	0.30
Uniface	1	0.20	1.2	0.10
TOTAL	415	99.90	1,299.8	100.10

TABLE 25: Total Inventory of Faunal Remains, Complete and Fragmentary for Level 4.

BISON:	Element	Number	Percentage
	1. Cranium	34	0.4
	2. Mandible	86	1.1
	3. Hyoid		
	4. Misc. Loose Incisor/Canine	12	0.1
	5. Misc. Loose Premolar/Molar	29	0.4
	6. Misc. Tooth Frags.	20	0.2
	7. Atlas		
	8. Axis		
	9. Cervical Vertebra (3-7)	1	0.01
	10. Thoracic Vertebra (1-14)	26	0.3
	11. Spinous Process	20	0.2
	12. Lumbar Vertebra (1-5)		
	13. Sacrum		
	14. Caudal Vertebra		
	15. Unident. Vertebra Frags.	2	0.02
	16. Rib	74	0.9
	17. Sternum		
	18. Scapula	11	0.1
	19. Humerus	19	0.2
	20. Radius	12	0.1
	21. Ulna	2	0.02
	22. Radial Carpal	6	0.07
	23. Ulnar Carpal	4	0.05
	24. Internal Carpal	3	0.04
	25. Unciform Carpal	1	0.01
	26. Accessory Carpal	2	0.02
	27. Fused 2nd/3rd Carpal	1	0.01
	28. Metacarpal	2	0.02
	29. Ischium	1	0.01
	30. Ilium		
	31. Pubis		
	32. Innominate Frags.		
	33. Femur	8	0.1
	34. Patella		
	35. Tibia	4	0.05
	36. Tibial Tarsal	2	0.02
	37. Calcaneous	1	0.01
	38. Lateral Malleolus	3	0.04
	39. Fused 2nd/3rd Tarsal	2	0.02
	40. Fused Central/4th Tarsal	4	0.05
	41. Metatarsal		
	42. Metapodial Frags.	13	0.2
	43. First Phalanx	13	0.2
	44. Second Phalanx	6	0.07
	45. Third Phalanx	10	0.1
	46. Inferior Sesamoid		
	47. Sesamoid	1	0.01
	48. Unident. Bone Frags.	7,628	94.6
	TOTAL =	8,064	99.8

NON-BISON FAUNAL REMAINS

Species	Element	Number
Clam	Valve	12
Canis sp.	Rib Frag.	1
Canis sp.	Phalanx	2
Canis sp.	Ulna	1
Canis sp.	Bone Frag.	2
Canis sp.	Tooth Frag.	4
Ground Squirrel	Tooth	2
Ground Squirrel	Bone Frag.	1
Beaver	Ulna	1

TABLE 26: Calculation of Minimum Number of Individuals for Bison in Level 4.

Element	Side	Number	MNI
1. Unciform Carpal	1R	1	1
2. Radial Carpal	3L 4R	7	4
3. Fused 2nd/3rd Carpal	1R	1	1
4. Ulnar Carpal	1L 3R	4	3
5. Internal Carpal	1L 2R	3	2
6. Radius	2L	2	2
7. Humerus	3L 1R	4	3
8. Mandible	1L	1	1
9. Metatarsal	1L	1	1
10. Fused 2nd/3rd Tarsal	1L	1	1
11. Fused Central/4th Tarsal	2L 1R	3	2
12. Lateral Malleolus	1L 2R	3	2
13. Tibial Tarsal	1R	1	1
14. Tibia	1R	1	1

MNI = 4

Feature 1-4_Hearth. About half of this feature was exposed in excavation unit C (Figure 20). The other half was exposed in the north-south trench. It is a roughly circular basin with a diameter of 50 cm and a maximum depth of 5 cm. It is filled with fire-reddened and blackened soil as well as some charcoal and burned bone fragments. Surrounding this burned area are a number of scattered fire-cracked rocks and several cobbles and boulders. Among these are fragments of bison bone. Also discovered in the vicinity of this hearth were two projectile points and two cores as well as lithic debitage.

6.4.4_Summary. Level 4 is an Oxbow complex occupation. The scattered and fragmented bison remains, some displaying cut marks, indicates that butchering and bone breaking activities occurred at this site. The animal carcasses were transported here from a kill site of unknown location. The presence of bison remains and the projectile points, cores and lithic debitage around the hearth feature suggest that food processing and possibly cooking and tool making and repairs were hearth related activities. Density maps based on numbers of items per square meter (Figures 22 and 23) indicate that the north-east corner of excavation unit A (Figure 19) was the location of the most dense accumulation, in the excavated area, of both lithic artifacts and faunal remains.

FIGURE 22

LEVEL 4

Density of Lithic Artifacts

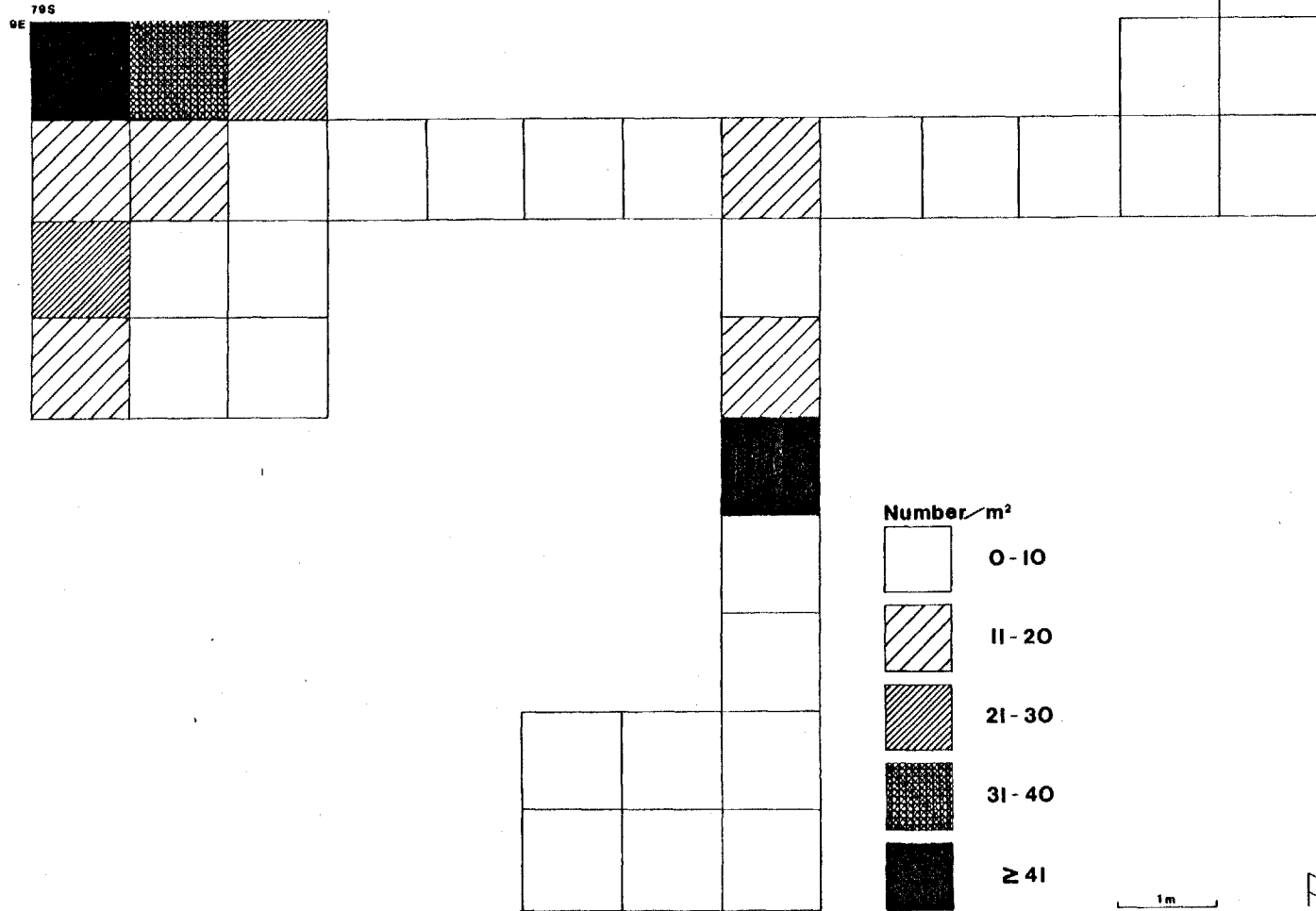
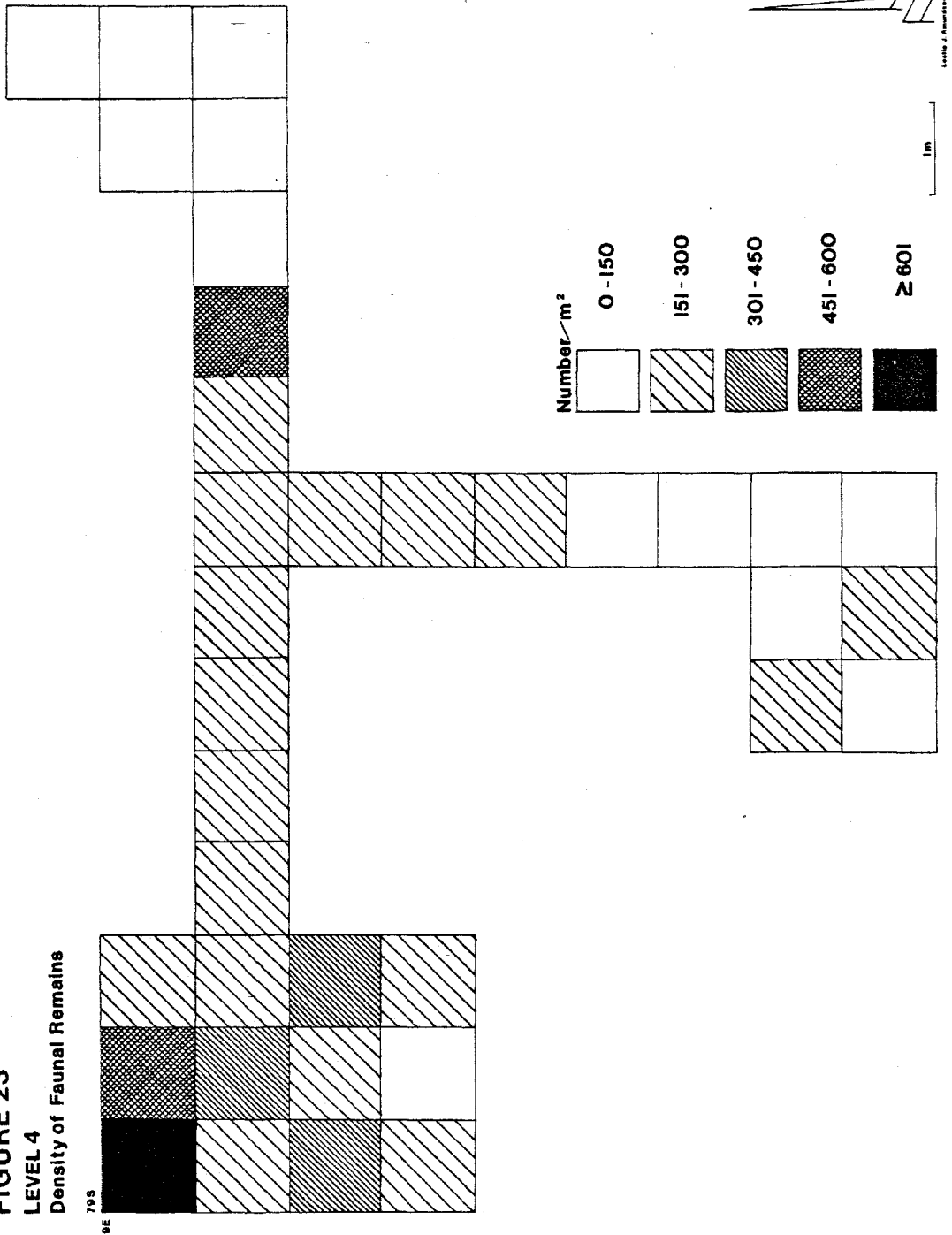


FIGURE 23
LEVEL 4
Density of Faunal Remains



6.5 Level 5

6.5. Cultural Assemblage.

Planviews of artifact distributions are given in Figures 24 and 25.

Lithic Artifacts.

Debitage. One hundred and sixty-nine lithic artifacts were recovered from level 5 at the Amisk site. Of these 162 (95.5%) are debitage; 74 or 43.8% are flakes and the remaining 88 or 52.1% are shatter. They are relatively evenly scattered across the excavated area.

Bifacial Knives. Two incomplete bifaces were discovered in the excavation of level 5.

FbNp-17-1227. This biface was found in square 80S, 9E near the centre of the west edge of excavation unit A (Figure 24). It is crudely made on a piece of grey Swan River chert. It appears to have been ovate in shape but is broken on a line transverse to its long axis. The maximum width of this biface is 45.6 mm.

FbNp-17-5391. This is a small fragment of the end of an ovate biface which was found in square 80S, 14E near the west end of the east-west trench. It is finely made on a

FIGURE 24
EXCAVATION UNIT A
LEVEL 5

- Projectile Point
- ▲ Flake
- Detritus
- Biface
- ⊙ Endscraper
- Fire Cracked Rock
- Rock
- Bone
- Burned Bone
- Tooth

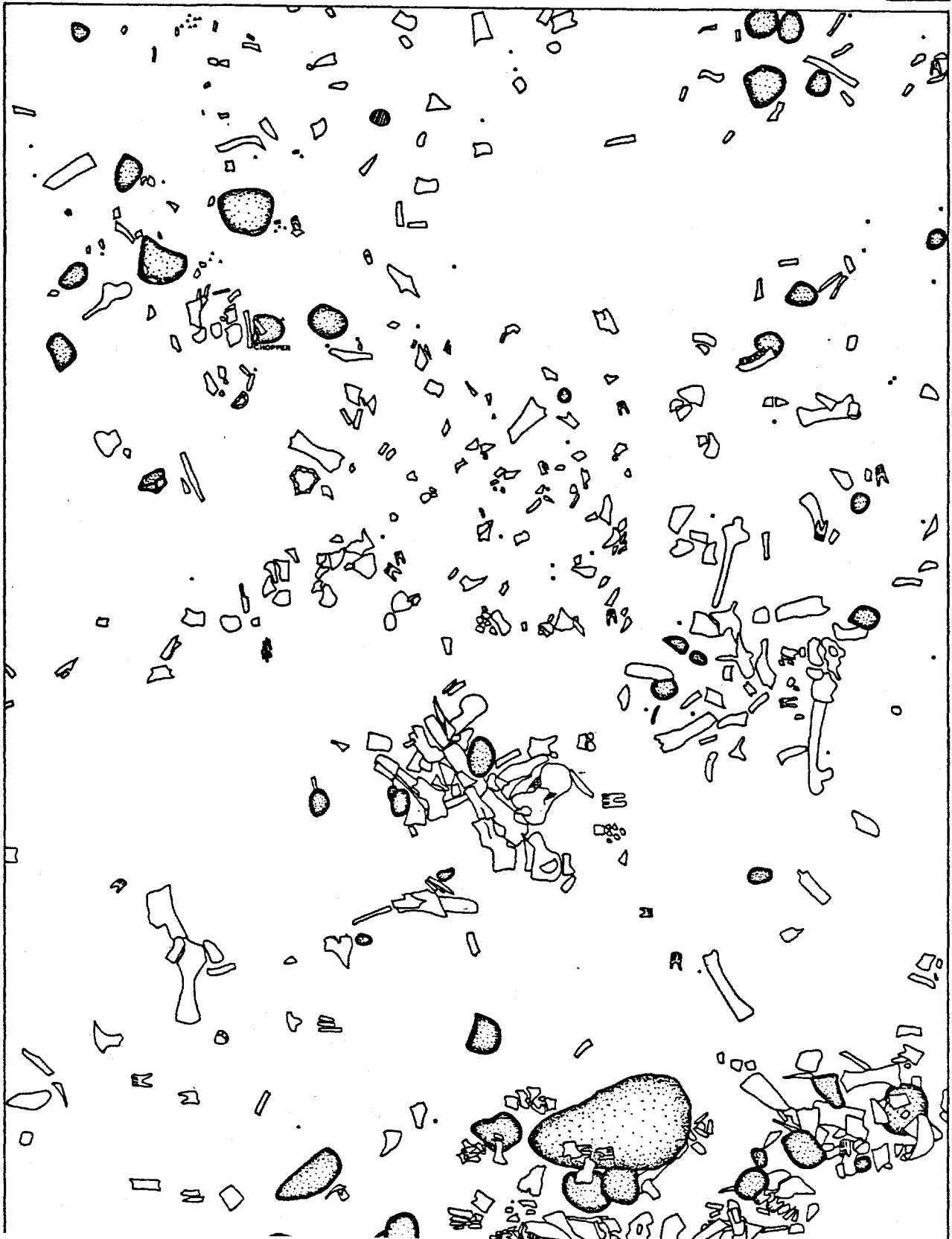
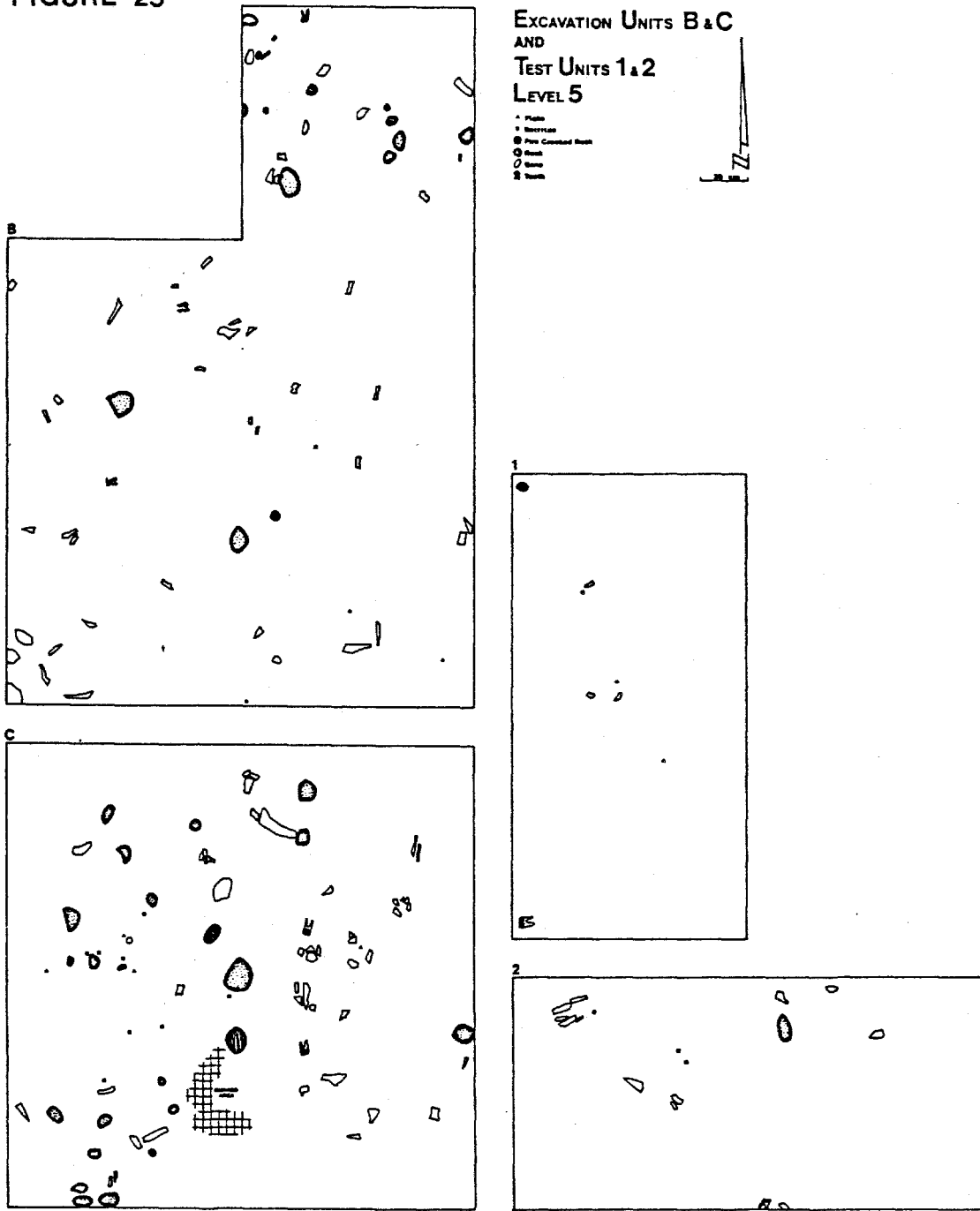


FIGURE 25



piece of grey/brown chalcedony. It appears to have been broken along a fault in the raw material (Plate 12, c).

Projectile Point. FbNp-17-1338 is a fragment of the base of an Oxbow point. It is finely made from a piece of welded volcanic tuff. It was found in square 80S, 10E which is near the centre of excavation unit A (Figure 24). This point fragment is illustrated in Plate 12, a.

Endscraper. FbNp-17-6203 is a typical endscraper made on a split black chert pebble. The endscraper is roughly triangular with a striking platform at its proximal end and flake scars from the blow required to split the pebble on its dorsal surface. On its ventral surface are a bulb of percussion and percussion rings expanding distally. This endscraper similar in size to the very small endscrapers described by Dyck, 1977, from the Harder site which is another Oxbow occupation near Saskatoon. It is 19.7 mm long, 18.9 mm wide and 4.6 mm in thickness. The total length of the working edge is 21.4 mm. The angle of the working edge is 45 degrees. This endscraper is illustrated in Plate 12, b.

Retouched Flake. FbNp-17-6165 is a crude, brown chalcedony flake with bifacial retouch on a portion of its edge. It was located in square 86S, 16E which is at the south end of the north-south trench. The flake is 45.3 mm long, 29.6 mm wide and 5.9 mm thick. 17 mm of the edge has been retouched. Little use wear is evident. This is probably an

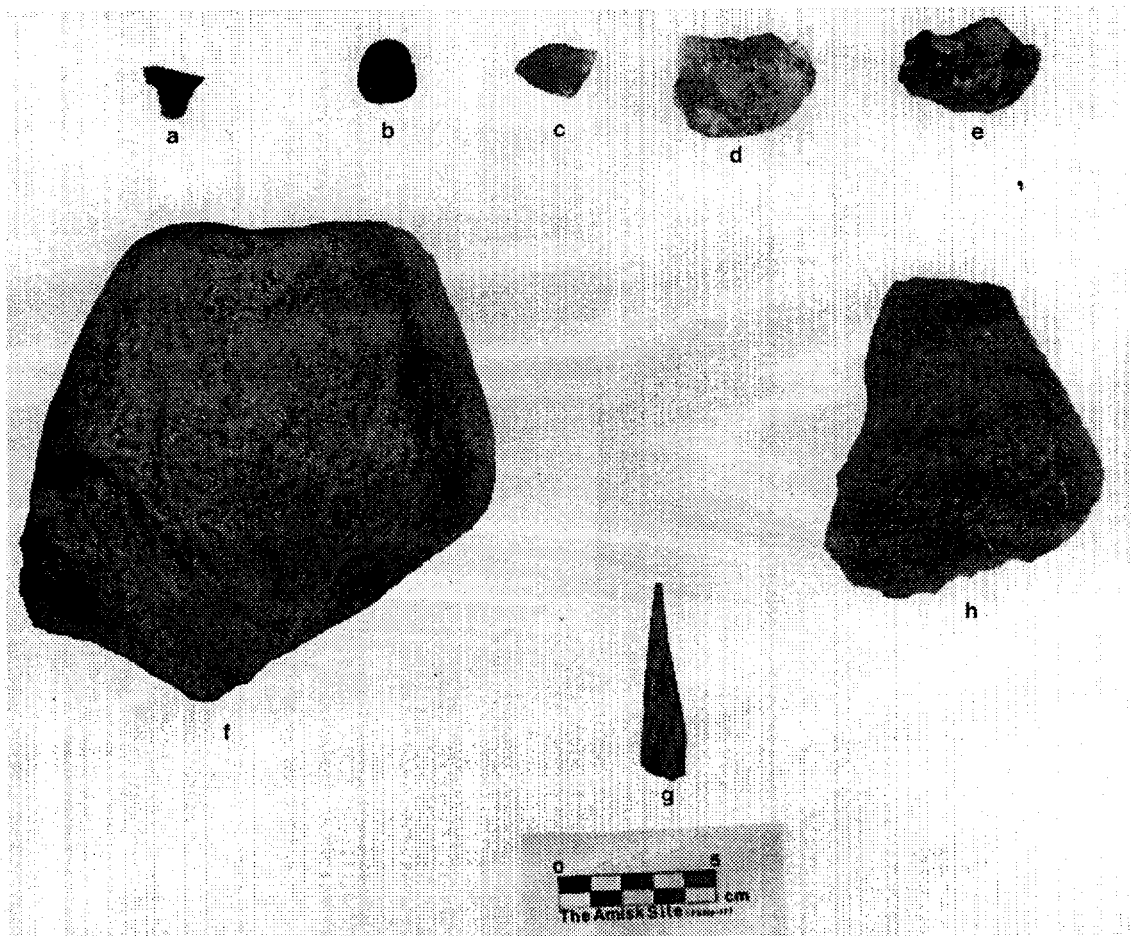


PLATE 12. Levels 5 and 6 Tools and Cores

- a. Projectile Point
- b. Endscraper
- c. Biface
- d-e. Cores
- f. Chopper / Anvil
- g. Bone Awl - Level 6
- h. Chopper

expediency tool which was used for a short period then discarded.

Chopper. FbNp-17-1245 is a large, triangular flake of grey, medium-grained quartzite (Plate 12, h). It was located in square 80S, 9E near the centre of the west edge of excavation unit A (Figure 24). It is 99.3 mm long, 86.9 mm wide and 32 mm thick. The battered distal edge of this flake suggests that it is a chopping tool possibly used for dismemberment and breakage of the skeletal elements which were found scattered around it.

Hammerstone/Anvilstone. FbNp-17-1221 is a large sandstone cobble about 155 mm long, 150 mm wide and 80 mm thick. It is pitted and battered on its ends and sides indicating use as a hammer and anvil. It was found in square 80S, 9E in close proximity with other cobbles and shattered bones. It was probably used as a tool for breaking bones. It is illustrated in Plate 12, f.

Fire-Cracked Rock. Seventeen fragments of fire-cracked rock having a total weight of 4435.7 grams and an average weight of 260.9 grams were recovered from level 5.

Lithic Raw Materials. Ten lithic raw material types were utilized in level 5. Seven of these are local varieties. In order of decreasing frequency by numbers of items they are: fine-grained quartzite; chert; medium-grained quartzite;

quartz; Swan River chert; coarse-grained quartzite; and jasper. There are 3 exotic lithic types represented in level 5 as well. They are, in order of decreasing abundance: chalcedony; welded volcanic tuff; and obsidian. Details of the lithic assemblage are given in Tables 27, 28 and 29.

6.5.2 Faunal Assemblage. The preservation of bone in level 5 at the Amisk site is very good. Remains of four species were recovered during excavations in this occupation. Bison is dominant making up 99.4% of the total inventory of faunal remains. The NISP for bison is 4,256. Of these 535 are identifiable fragments. The remaining 3,721 are comminuted bone of which 166 fragments or 4.5% are burned. The NISP for ground squirrel is 20. These may be intrusive. For Canis sp. the NISP is six and for a species of clam, Unio sp., the NISP is three. The total inventory of bone complete and fragmentary is presented in Table 30. The MNI for bison in level 5 is six. Calculation of the MNI is displayed in Table 31. The fragmentary nature of bone and the presence of cut marks on some specimens suggests that the faunal assemblage of level 5 represents the remains of butchering activities and the breakage of bone for marrow extraction.

6.5.3 Features.

Feature 1-5 Boulder Alignment. This feature occurs in the southeast corner of excavation unit A (Figure 24). It is

TABLE 27: Frequencies of Lithic Materials by Number for Level 5

MATERIAL	FORM										TOTALS							
	Shatter		Flake		Biface		Retouched Flake		Core		Point		Endscraper		Chopper		No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Fine- Grained Quartzite	23	26.1	23	31.1													46	27.2
Chert	17	19.3	20	27.0									1	100.0			39	23.1
Medium- Grained Quartzite	12	13.6	13	17.6					1	100.0					1	100.0	26	15.4
Quartz	15	17.0	8	10.8													23	13.9
Swan River Chert	10	11.4	4	5.4	1	50.0											15	8.9
Coarse- Grained Quartzite	7	8.0	2	2.7													9	5.3
Chalcedony	1	1.1	4	5.4	1	50.0	1	100.0									7	4.1
Jasper	2	2.3															2	1.2
Volcanic Tuff											1	100.0					1	0.6
Obsidian	1	1.1															1	0.6
TOTAL	88	99.9	74	100.0	2	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1	100.0	169	99.7

TABLE 28: Frequencies of Lithic Materials by Weight (in grams) for Level 5

MATERIAL	FORM										TOTALS							
	Chopper		Shatter		Core		Flake		Biface		Point		Retouched Flake		Endscraper		Wt.	%
	Wt.	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%
Medium- Grained Quartzite	1,155.4	100.00	84.9	11.80	256.6	100.00	31.6	21.20									1,528.5	66.00
Chert			208.8	29.10			31.7	21.30							2.1	100.00	242.6	10.50
Coarse- Grained Quartzite			129.3	18.00			13.2	8.90									142.5	6.20
Quartz			131.6	18.30			7.2	4.80									138.8	6.00
Fine- Grained Quartzite			78.2	10.90			43.6	29.30									121.8	5.30
Swan River Chert			73.8	10.30			12.5	8.40	14.4	80.00							100.7	4.30
Chalcedony			5.4	0.80			9.0	6.00	3.6	20.00			8.1	100.00			26.1	1.10
Volcanic Tuff											9.0	100.00					9.0	0.40
Obsidian			5.4	0.80													5.4	0.20
Jasper			0.9	0.10													0.9	0.40
TOTALS	1,155.4	100.00	718.3	100.10	256.6	100.00	148.8	99.90	18.0	100.00	9.0	100.00	8.1	100.00	2.1	100.00	2,316.3	100.04

TABLE 29: Frequencies of Lithic Forms by Number and Weight for Level 5

FORM	NUMBER	PERCENTAGE	WEIGHT	PERCENTAGE
Shatter	88	52.10	718.3	31.00
Flake	74	43.80	148.8	6.40
Bifacial Knife	2	1.20	18.0	0.80
Chopper	1	0.60	1,155.4	49.90
Core	1	0.60	256.6	11.10
Projectile Point	1	0.60	9.0	0.40
Retouched Flake	1	0.60	8.1	0.30
Endscraper	1	0.60	2.1	0.10
TOTAL	169	100.10	2,316.4	100.00

TABLE 30: Total Inventory of Faunal Remains, Complete and Fragmentary for Level 5.

BISON:	Element	Number	Percentage
	1. Cranium	68	1.6
	2. Mandible	102	2.4
	3. Hyoid		
	4. Misc. Loose Incisor/Canine	1	0.02
	5. Misc. Loose Premolar/Molar	44	1.0
	6. Misc. Tooth Frags.	5	0.1
	7. Atlas	2	0.05
	8. Axis	1	0.02
	9. Cervical Vertebra (3-7)	3	0.07
	10. Thoracic Vertebra (1-14)	18	0.4
	11. Spinous Process	8	0.2
	12. Lumbar Vertebra (1-5)	5	0.1
	13. Sacrum	12	0.3
	14. Caudal Vertebra		
	15. Unident. Vertebra Frags.	3	0.07
	16. Rib	75	1.8
	17. Sternum	1	0.02
	18. Scapula	14	0.3
	19. Humerus	12	0.3
	20. Radius	19	0.4
	21. Ulna	8	0.2
	22. Radial Carpal	1	0.02
	23. Ulnar Carpal	4	0.1
	24. Internal Carpal	1	0.02
	25. Unciform Carpal	1	0.02
	26. Accessory Carpal	1	0.02
	27. Fused 2nd/3rd Carpal	3	0.07
	28. Metacarpal	8	0.2
	29. Ischium	8	0.2
	30. Ilium	14	0.3
	31. Pubis	1	0.02
	32. Innominate Frags.	6	0.1
	33. Femur	3	0.07
	34. Patella	1	0.02
	35. Tibia	9	0.2
	36. Tibial Tarsal	1	0.02
	37. Calcaneous	5	0.1
	38. Lateral Malleolus	4	0.1
	39. Fused 2nd/3rd Tarsal	8	0.2
	40. Fused Central/4th Tarsal	8	0.2
	41. Metatarsal	4	0.1
	42. Metapodial Frags.	4	0.1
	43. First Phalanx	14	0.3
	44. Second Phalanx	8	0.2
	45. Third Phalanx	13	0.3
	46. Inferior Sesamoid		
	47. Sesamoid	1	0.02
	48. Unident. Bone Frags.	3,721	87.4
	TOTAL =	4,256	100.05

NON-BISON FAUNAL REMAINS

Species	Element	Number
Clam	Valve	3
Canis sp.	Molar	1
Canis sp.	Phalanx	1
Canis sp.	Vertebra Frag.	1
Canis sp.	Carpal	1
Canis sp.	Tooth Frag.	2
Ground Squirrel	Mandible	1
Ground Squirrel	Bone Frag.	11
Ground Squirrel	Crania	8

TABLE 31: Calculation of Minimum Number of Individuals for Bison in Level 5.

Element	Side	Number	MNI
1. Metacarpal	2L 2R	4	2
2. Unciform Carpal	1R	1	1
3. Radial Carpal	1R	1	1
4. Fused 2nd/3rd Carpal	1L 2R	3	2
5. Ulnar Carpal	4R	4	4
6. Internal Carpal	1L	1	1
7. Radius	3L	3	3
8. Ulna	1L 1R	2	1
9. Humerus	1L	1	1
10. Scapula	1L	1	1
11. Axis	--	1	1
12. Thoracic Vertebra	--	2	1
13. Lumbar Vertebra	--	1	1
14. Metatarsal	1L	1	1
15. Fused 2nd/3rd Tarsal	5L 2R	7	5
16. Fused Central/4th Tarsal	6L 2R	8	6
17. Lateral Malleolus	3L	3	3
18. Tibial Tarsal	1L	1	1
19. Calcaneous	3R	3	3
20. Tibia	1L 2R	3	2
21. Femur	1R	1	1

MNI = 6

a 50 cm wide band of cobbles, boulders and fragmented bison and canid bones and teeth which forms an arc oriented northeast-southwest. Only a small portion of the feature was exposed during excavations at the Amisk site making speculation as to its form and function difficult. It appears to be the continuation of a feature used during the occupation of level 6 as discussed below.

Feature 2-5 Pit. This is a shallow basin located in square 81S, 10E just south of the centre of excavation unit A (Figure 24). It is an oblong pit 80 cm long, 60 cm wide and 10 cm deep oriented in a northwest-southeast direction. This pit is entirely filled with large bison bone fragments. There are articulated thoracic vertebrae, cervical vertebrae and bones of the lower forelimb. There is no evidence of fire-reddening of the surrounding soil.

Feature 3-5 Hearth. This is an "L-shaped" area of blackened and reddened soil near the centre of excavation unit C (Figure 25). It is apparently the result of a short period of burning. The feature contains a few burned bones. Its vertical extent is minimal, approximately 1 cm. A number of scattered fire-cracked rocks and fragmented bison bones were found surrounding this hearth.

6.5.4 Summary. Level 5 appears to be a processing area related to a bison kill site of unknown location. Butchering and bone breaking activities are indicated by the presence of

fragmented bone, some displaying cut marks, and by the presence of cutting, chopping and hammering tools. Choroplethic maps of artifact distributions in level 5 are provided in Figure 26 and 27. They indicate that lithic artifacts are concentrated in the northeast part of excavation unit A and that the east half of the same unit is the site of the most dense accumulation of faunal remains.

6.6 Level 6

6.6.1 Cultural Assemblage.

Planviews of artifact distributions are given in Figures 28 and 29.

Lithic Artifacts.

Debitage. Ninety-four lithic artifacts were recovered from level 6. All are debitage of which 59 are flakes and the remaining 35 are shatter. Eight lithic raw materials are represented. Six of these are local varieties. They are, in order of decreasing abundance: medium-grained quartzite; chert; fine-grained quartzite; Swan River chert; coarse-grained quartzite and quartz. Two exotic raw material types are also present. There is one item each of brown chalcedony and welded volcanic tuff. Details of the lithic

FIGURE 26

LEVEL 5
Density of Lithic Artifacts

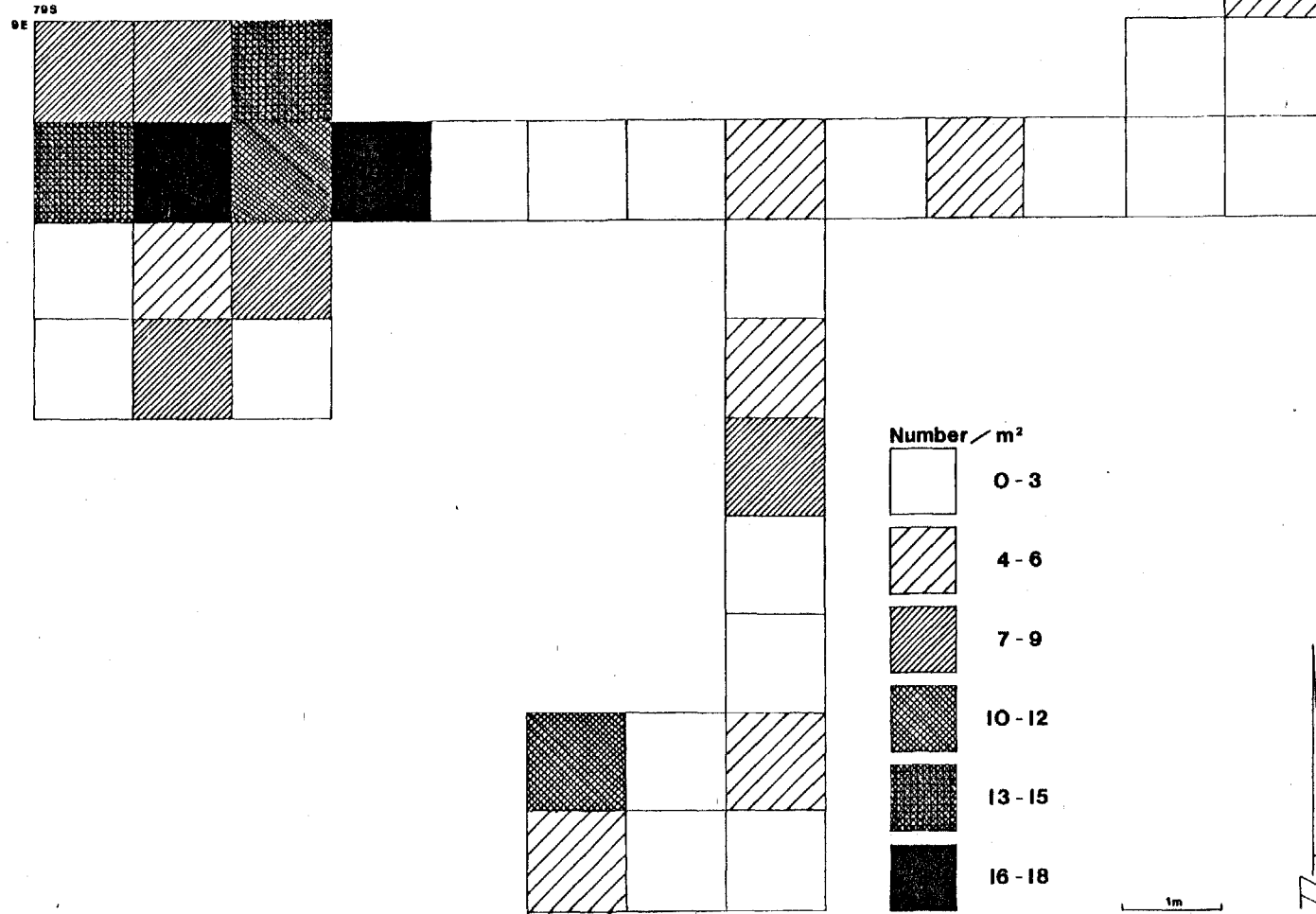


FIGURE 27

LEVEL 5
Density of Faunal Remains

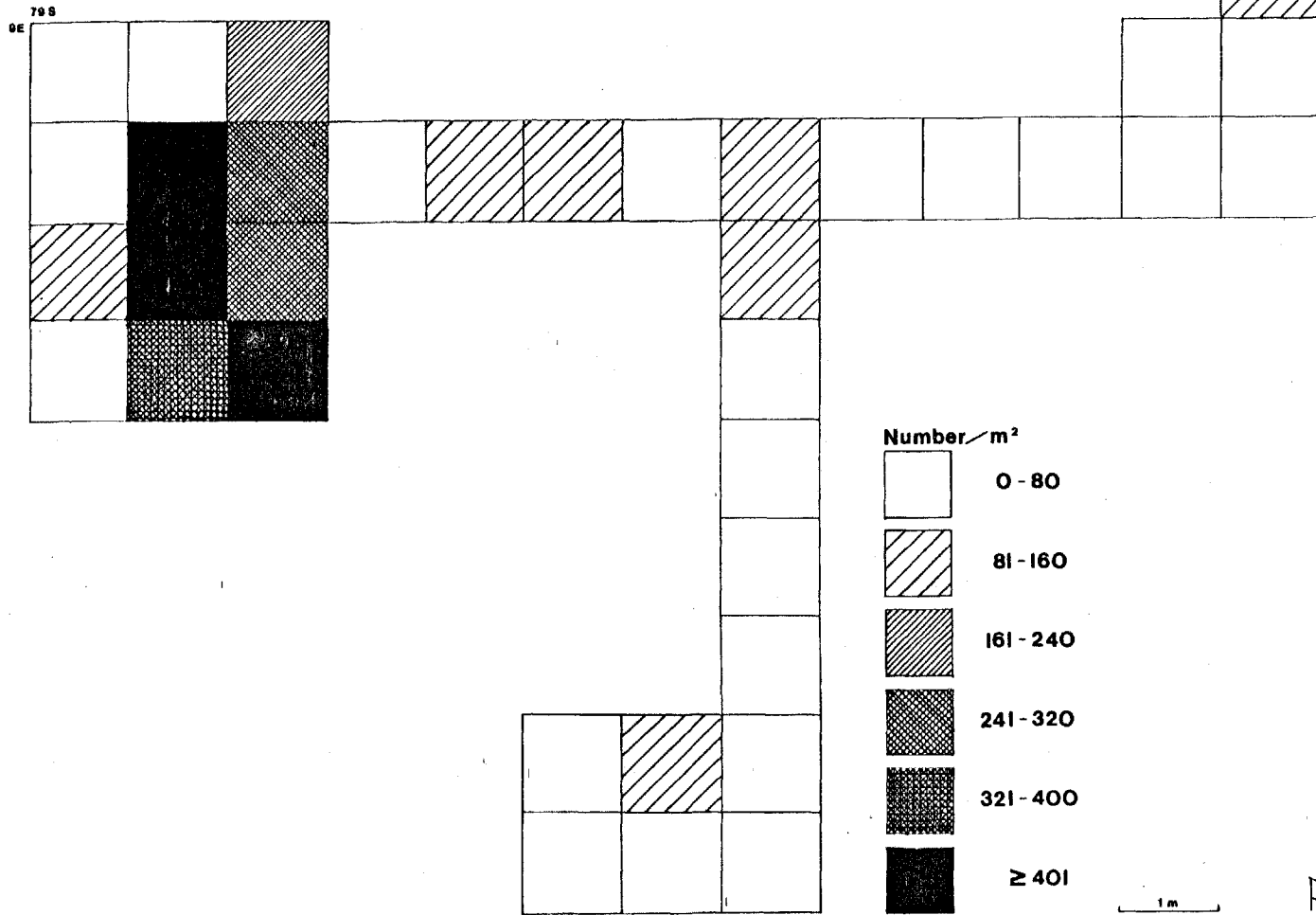


FIGURE 28

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EXCAVATION UNIT A

LEVEL 6

- Flake
- Detritus
- Fire Cracked Rock
- Rock
- Bone
- ▲ Tooth

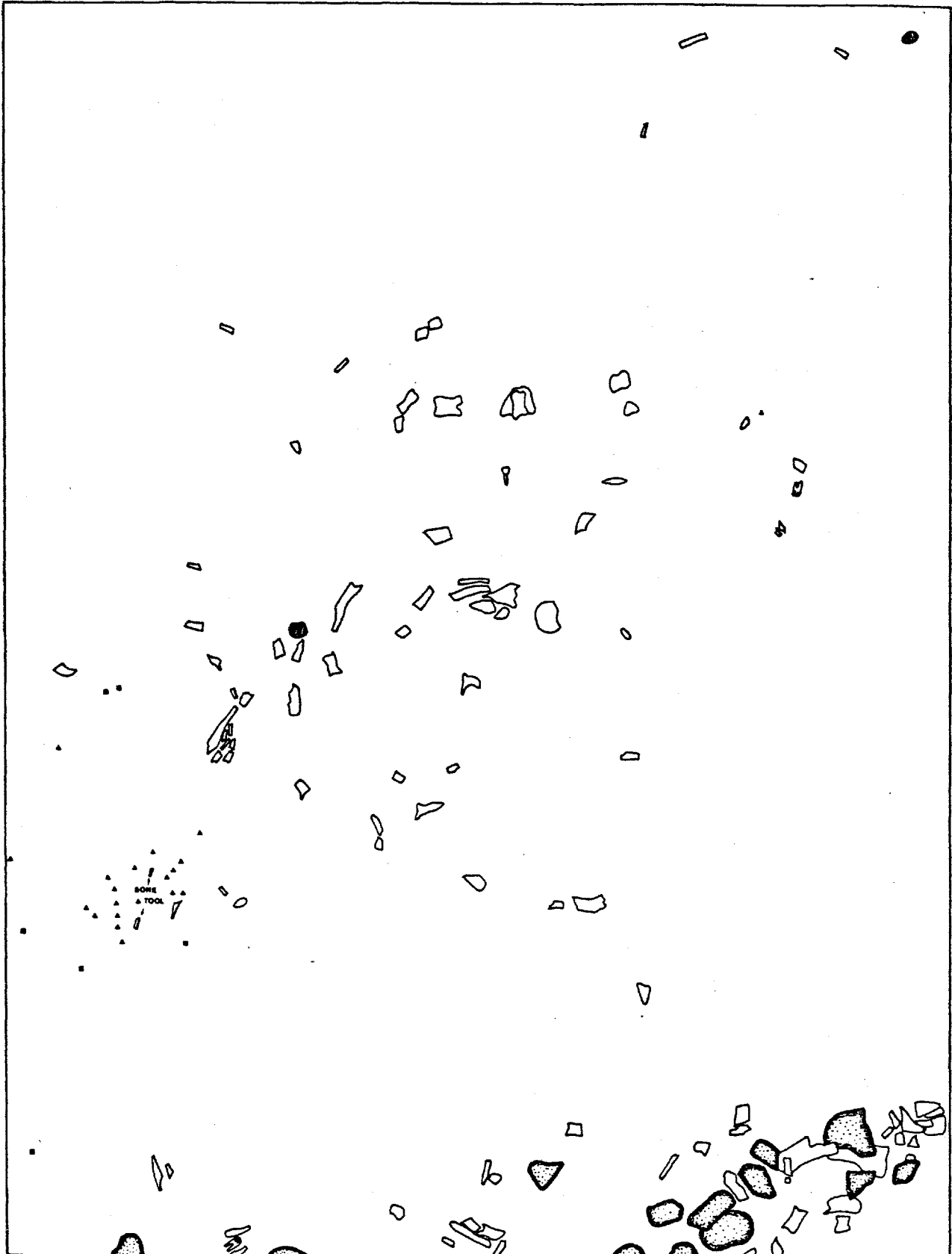
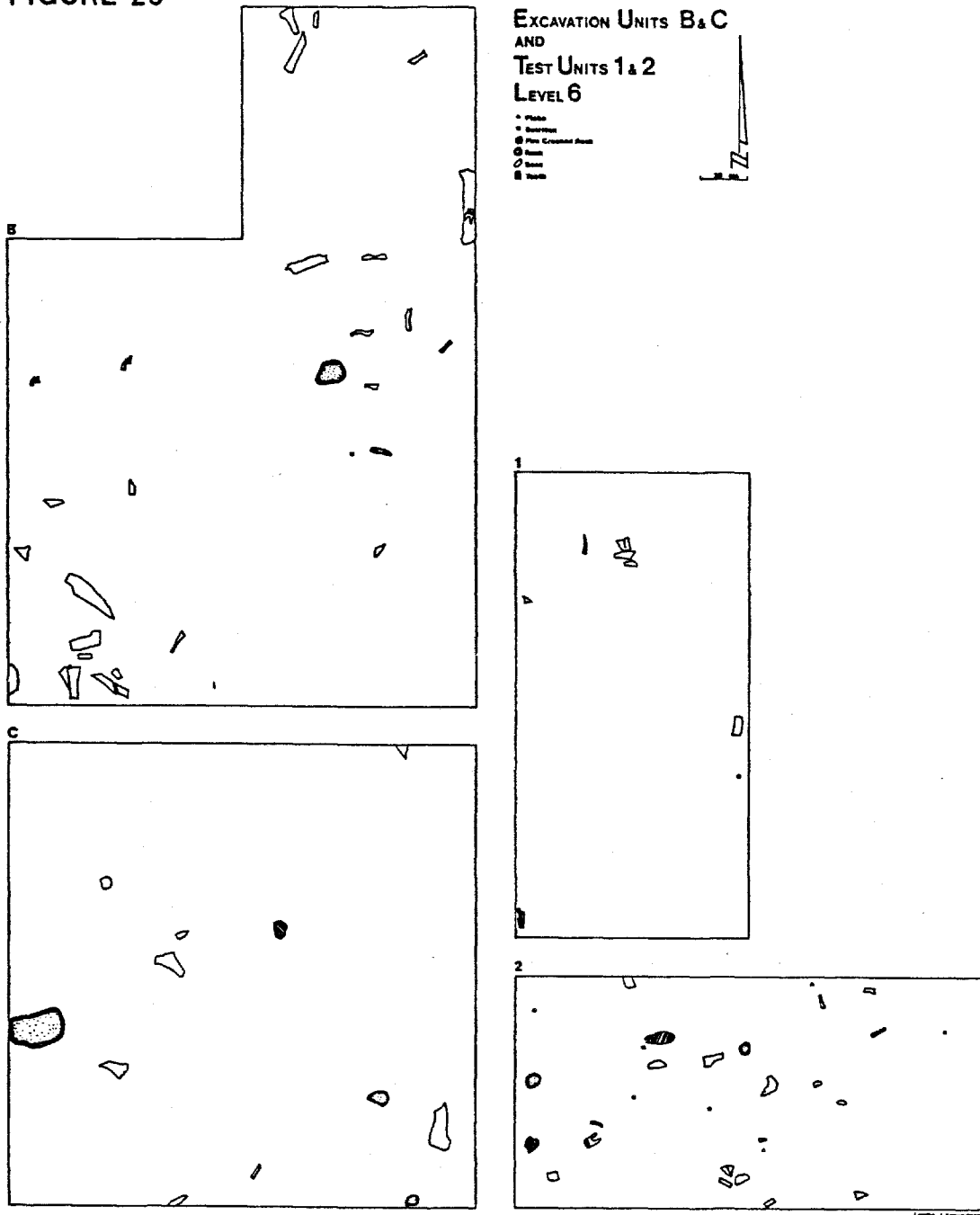


FIGURE 29



assemblage are tabulated in Tables 32 and 33.

Fire-Cracked Rock. Four fragments of fire-cracked rock having a total weight of 3894.2 grams and an average weight of 973.5 were found in various locations in level 6.

Bone Tools. One bone tool was discovered in level 6. It was located in square 81S, 9E near the southwest corner of excavation unit A (Figure 28). It is a splinter of bone 63 mm long which is tapered and highly polished at one end (Plate 12, g); a typical bone awl. This awl was found in two pieces about 15 cm apart suggesting it was broken and discarded.

6.6.2 Faunal Assemblage. The preservation of bone in level 6 is good. Only bison remains were recovered during excavations of this occupation level. The NISP is 1,150 of which 145 are identifiable bones and 1,005 are comminuted bone. There are 11 fragments of burned bone which represents 1.1% of the comminuted bone. The total inventory of complete and fragmentary bone is given in Table 34. The MNI for bison is two. Calculation of the MNI is displayed in Table 35.

6.6.3 Features.

Feature 1-6 Chipping Station. This is a roughly circular cluster of large, grey, medium-grained quartzite flakes. The feature is about 30 cm in diameter. It is located in square 81S, 9E near the southwest corner of excavation unit A (Figure 28). These flakes are apparently

TABLE 32: Frequencies of Lithic Materials by Number and Weight (in grams) for Level 6

MATERIAL	FORM								TOTALS			
	Shatter				Flake							
	No.	%	Wt.	%	No.	%	Wt.	%	No.	%	Wt.	%
Medium-Grained Quartzite	14	40.0	99.4	37.1	23	39.0	193.8	82.0	37	39.4	293.2	58.1
Chert	7	20.0	46.2	17.2	21	35.6	23.1	9.8	28	29.8	69.3	13.7
Fine-Grained Quartzite	6	17.1	26.7	10.0	14	23.7	17.7	7.5	20	21.3	44.4	8.8
Swan River Chert	3	8.6	10.9	4.1					3	3.2	10.9	2.2
Coarse-Grained Quartzite	2	5.7	58.1	21.7					2	2.1	58.1	11.5
Quartz	2	5.7	23.2	8.7					2	2.1	23.2	4.6
Chalcedony					1	1.7	1.8	0.8	1	1.1	1.8	0.4
Volcanic Tuff	1	2.9	3.4	1.3					1	1.1	3.4	0.7
TOTALS	35	100.0	267.9	100.1	59	100.0	236.4	100.1	94	100.1	504.3	100.0

TABLE 33: Frequencies of Lithic Forms by Number and Weight for Level 6

FORM	NUMBER	PERCENTAGE	WEIGHT	PERCENTAGE
Shatter	35	37.20	267.9	53.10
Flake	59	62.80	236.4	46.90
TOTAL	94	100.00	504.3	100.00

TABLE 34: Total Inventory of Faunal Remains, Complete and Fragmentary for Level 6.

BISON: Element	Number	Percentage
1. Cranium	34	3.0
2. Mandible		
3. Hyoid		
4. Misc. Loose Incisor/Canine	3	0.3
5. Misc. Loose Premolar/Molar	5	0.4
6. Misc. Tooth Frags.	6	0.5
7. Atlas		
8. Axis		
9. Cervical Vertebra (3-7)		
10. Thoracic Vertebra (1-14)		
11. Spinous Process	5	0.4
12. Lumbar Vertebra (1-5)		
13. Sacrum		
14. Caudal Vertebra		
15. Unident. Vertebra Frags.		
16. Rib	33	2.9
17. Sternum		
18. Scapula	10	0.9
19. Humerus	2	0.2
20. Radius	1	0.1
21. Ulna		
22. Radial Carpal		
23. Ulnar Carpal		
24. Internal Carpal	1	0.1
25. Unciform Carpal	1	0.1
26. Accessory Carpal		
27. Fused 2nd/3rd Carpal		
28. Metacarpal	1	0.1
29. Ischium	1	0.1
30. Ilium	5	0.4
31. Pubis	1	0.1
32. Innominate Frags.		
33. Femur		
34. Patella		
35. Tibia	7	0.6
36. Tibial Tarsal	1	0.1
37. Calcaneous		
38. Lateral Malleolus	2	0.2
39. Fused 2nd/3rd Tarsal	2	0.2
40. Fused Central/4th Tarsal	4	0.3
41. Metatarsal	2	0.2
42. Metapodial Frags.		
43. First Phalanx	4	0.3
44. Second Phalanx	10	0.9
45. Third Phalanx	4	0.3
46. Inferior Sesamoid		
47. Sesamoid		
48. Unident. Bone Frags.	1,005	87.4
TOTAL =	1,150	100.2

TABLE 35: Calculation of Minimum Number of Individuals for Bison in Level 6.

Element	Side	Number	MNI
1. Unciform Carpal	1R	1	1
2. Radius	1L	1	1
3. Humerus	1L 1R	2	1
4. Scapula	1R	1	1
5. Fused 2nd/3rd Tarsal	1L 1R	2	1
6. Fused Central/4th Tarsal	2L 2R	4	2
7. Lateral Malleolus	1L 1R	2	1
8. Tibial Tarsal	1L	1	1
9. Tibia	1R	1	1

MNI = 2

all the result of reduction of the same core. The relatively coarse nature of the raw material suggests that these flakes were removed in the production of a core tool such as a chopper. The bone awl described above was found in this feature.

Feature 2-6 Boulder Alignment. This feature was only partially exposed during excavations at the Amisk site. It is a linear or slightly arced band of boulders and fragmented bison bone about 40 cm wide which crosses the southeast corner of excavation unit A in a southwest to northeast direction (Figure 28). It is apparent that only a small portion of this feature has been exposed making speculation about its total form and probable function difficult. This feature directly underlies a similar feature in level 5. This may indicate that the level 5 feature is intrusive to level 6, however, there is some separation between the features by sterile sediments. More probably this feature was first used during the occupation of level 6 and then rebuilt or added to during the occupation of level 5. The overlapping radiocarbon dates for these two occupations indicates close temporal proximity and supports the suggestion that this feature saw continued use from one occupation to the next.

6.6.4 Summary. The cultural remains of level 6 (Figure 28 and 29) are sparsely scattered throughout the excavated area. The fragmentary bison remains indicate that some butchering activities occurred here. Carcasses were

transported to this processing area from a kill site of unknown location. Feature 1-6 provides evidence of core reduction or tool making activities at this site as well. Distribution of lithic artifacts and faunal remains are plotted in Figures 30 and 31. Lithic artifacts are most concentrated in the southwest part of excavation unit A. The most dense accumulation of faunal remains in the excavated area occurred in the south half of excavation unit A.

6.7 Level 7

6.7.1 Cultural Assemblage.

Planviews of artifact distributions are given in Figures 32 and 33.

Lithic Artifacts.

Debitage. Level 7 yielded 24 lithic artifacts all of which are debitage. Eight of these (33.3%) are flakes. The remaining 16 (66.7%) are shatter. Six lithic raw material types are represented in level 7. All are local varieties. In order of decreasing frequency by numbers of items they are: fine-grained quartzite, quartz, chert, medium-grained quartzite, Swan River chert and coarse-grained quartzite. Inventories of lithic items are given in Tables 36 and 37.

FIGURE 30
LEVEL 6
Density of Lithic Artifacts

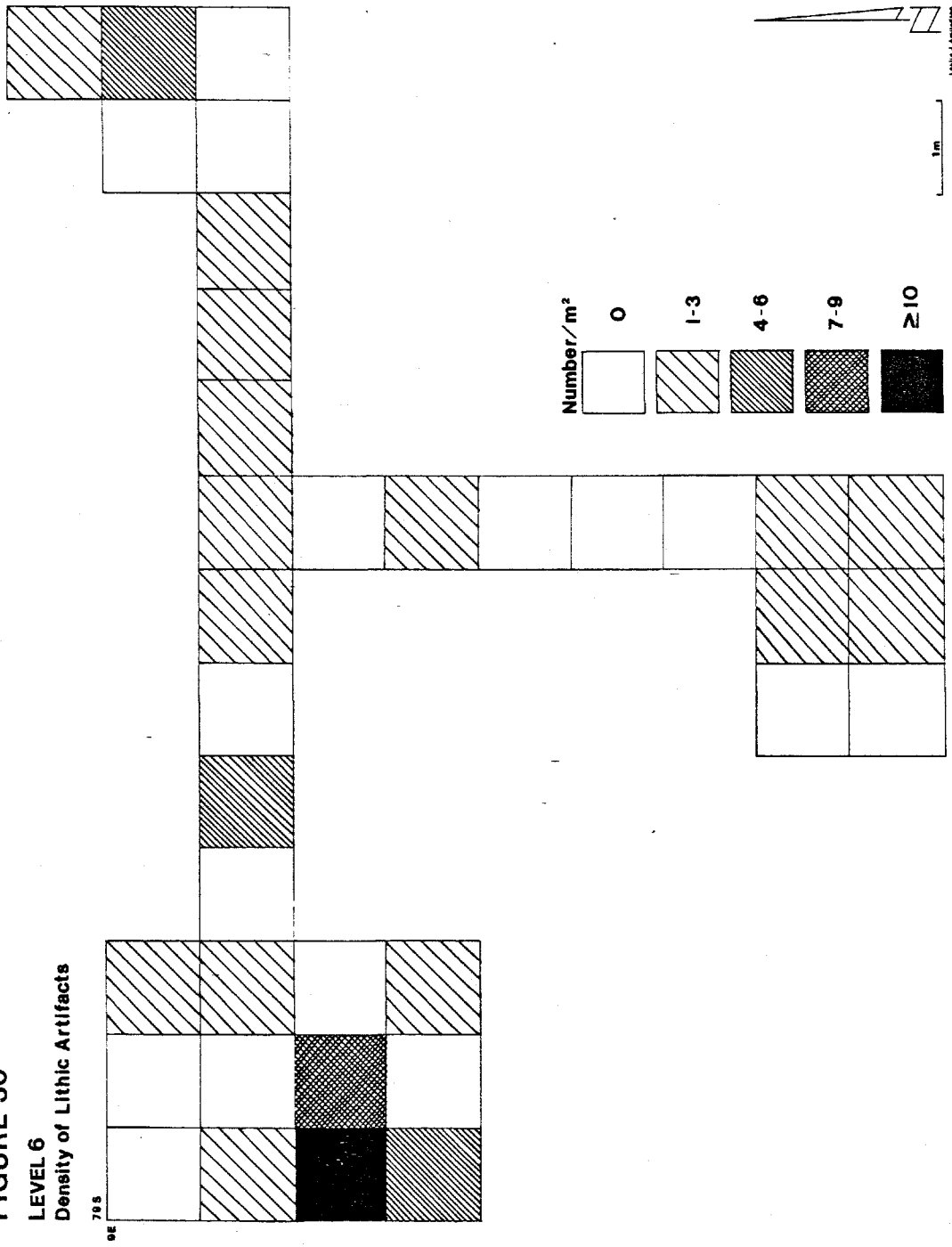
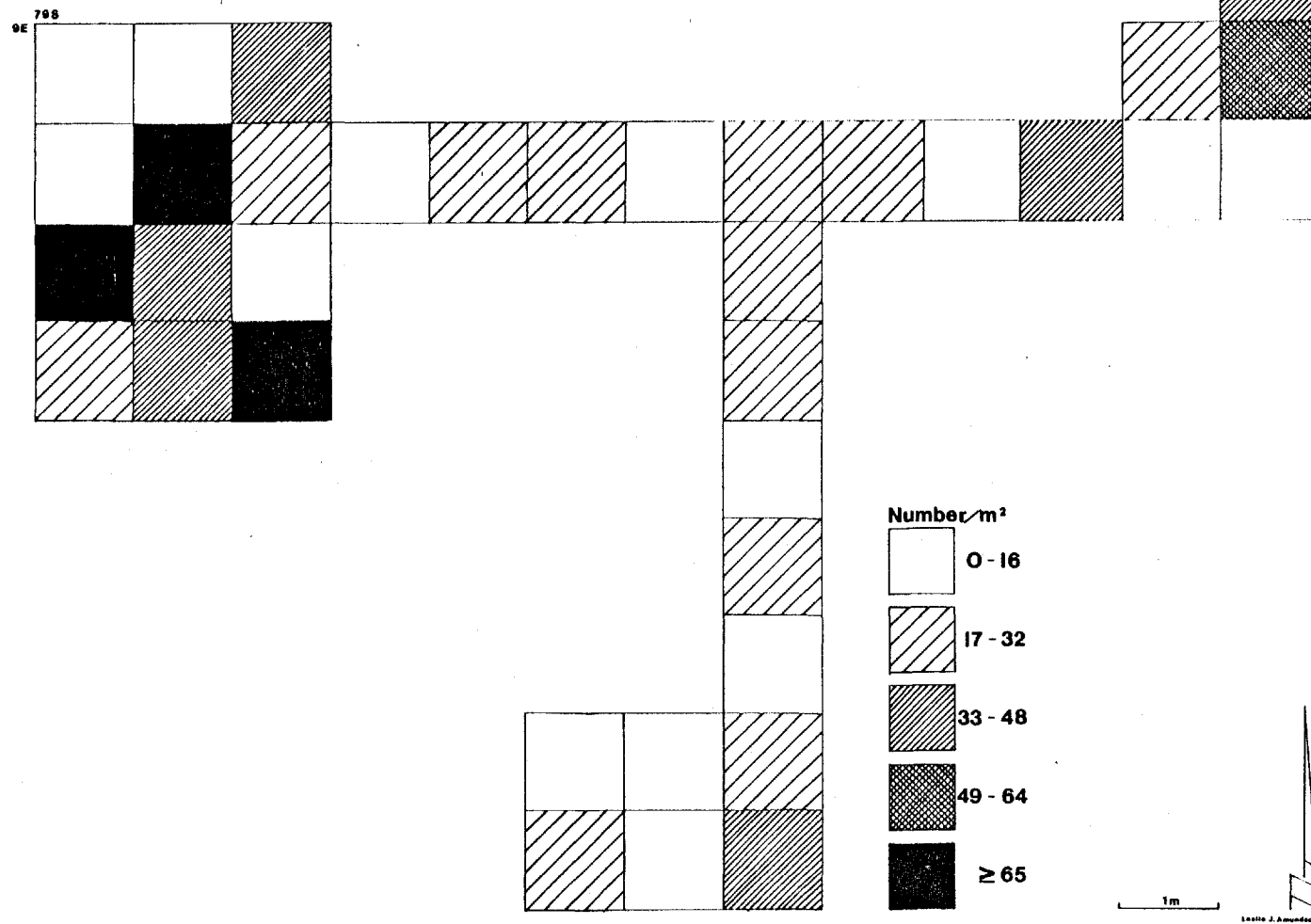


FIGURE 31

**LEVEL 6
Density of Faunal Remains**



EXCAVATION UNIT A

LEVEL 7

- Detritus
- Fire Cracked Rock
- Rock
- Bone
- Teeth

20 CM



FIGURE 33

EXCAVATION UNITS B & C
AND
TEST UNITS 1 & 2
LEVEL 7

- Detritus
- Rock
- ◊ Bone
- ◌ R.Y. Tooth

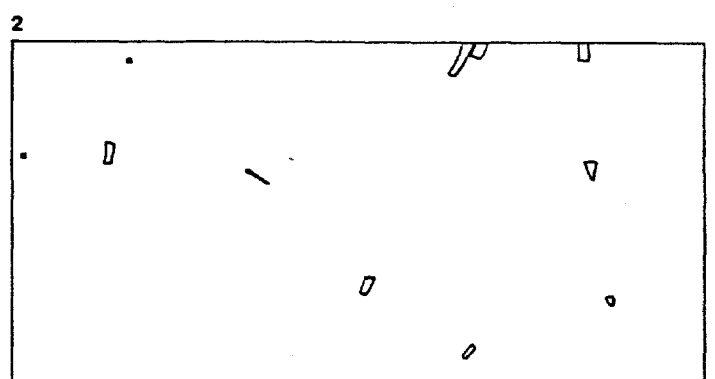
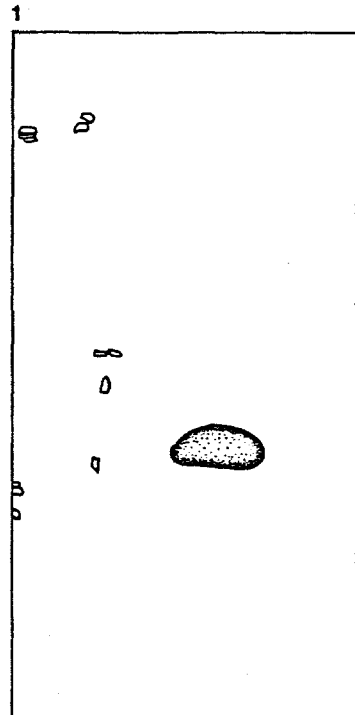
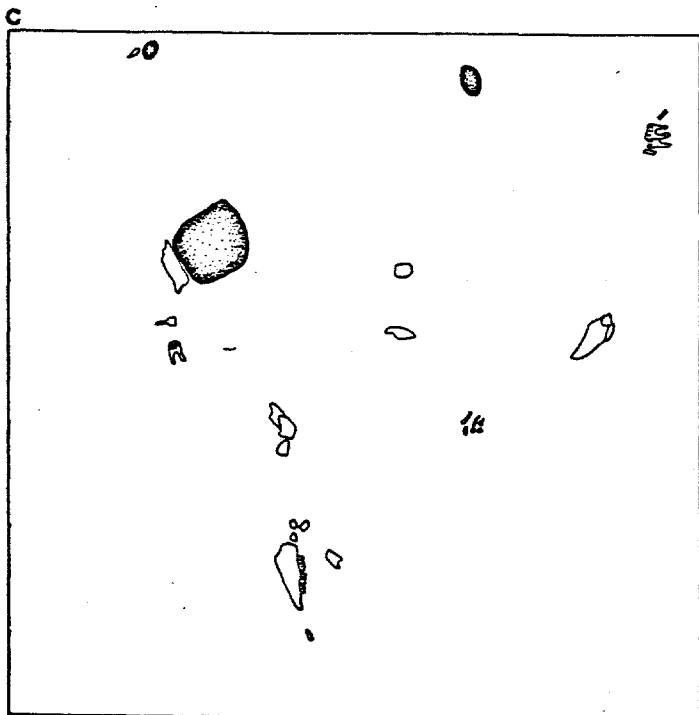
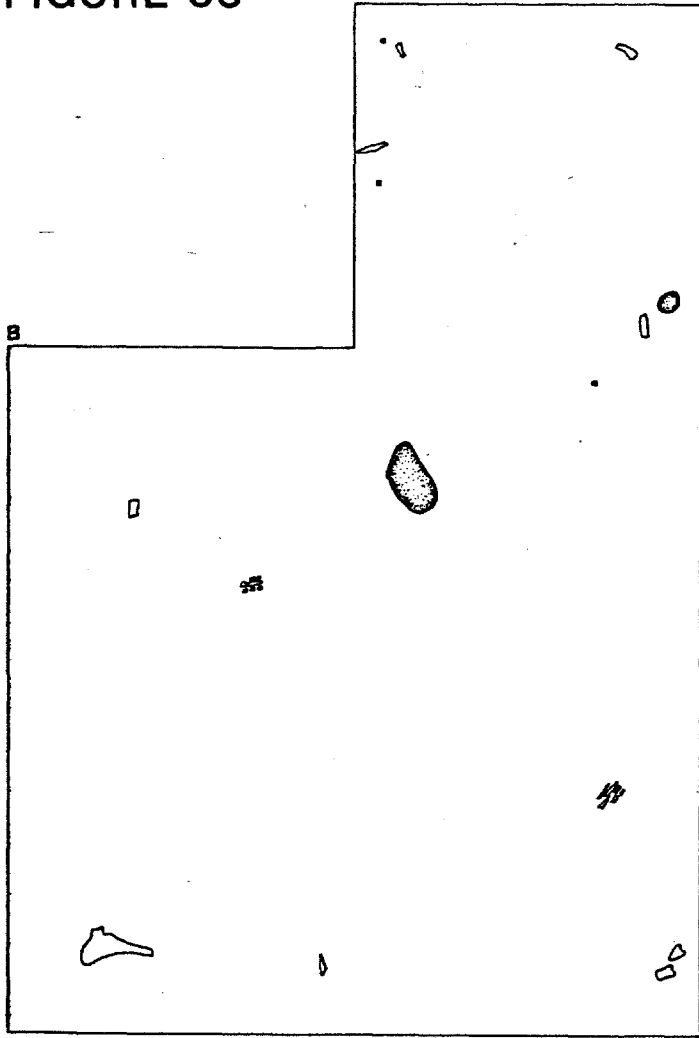


TABLE 36: Frequencies of Lithic Materials by Number and Weight (in grams) for Level 7

MATERIAL	FORM								TOTALS			
	Shatter				Flake				No.	%	Wt.	%
	No.	%	Wt.	%	No.	%	Wt.	%				
Fine-Grained Quartzite	3	18.8	6.3	4.6	4	50.0	6.8	25.0	7	29.2	13.1	8.0
Quartz	4	25.0	97.7	71.4	2	25.0	10.0	36.8	6	25.0	107.7	65.6
Chert	2	12.5	11.0	8.0	2	25.0	10.4	38.2	4	16.7	21.4	13.0
Medium-Grained Quartzite	4	25.0	1.3	0.9					4	16.7	1.3	0.8
Swan River Chert	2	12.5	3.9	2.8					2	8.3	3.9	2.4
Coarse-Grained Quartzite	1	6.3	16.7	12.2					1	4.3	16.7	10.2
TOTALS	16	100.1	136.9	99.9	8	100.0	27.2	100.0	24	100.1	164.1	100.0

TABLE 37: Frequencies of Lithic Forms by Number and Weight for Level 7

FORM	NUMBER	PERCENTAGE	WEIGHT	PERCENTAGE
Shatter	16	66.70	136.9	83.40
Flake	8	33.30	27.2	16.60
TOTAL	24	100.00	164.1	100.00

6.7.2 Faunal Assemblage. Preservation of larger, denser bones in level 7 is good. However, smaller bone fragments are highly decomposed and crumble easily when removed from their sedimentary matrix. Bison represents 99.5% of the faunal assemblage of this level. Two other species, Odocoileus sp. (deer) and Canis sp., are also present. The NISP for bison is 1,129 pieces. Of these 899 are small fragments of which 10, or 1.1%, are burned. The NISP for Canis sp. is five and for deer is one. A total inventory of faunal remains is given in Table 38. In level 7 the remains of at least three bison and one each of deer and Canis sp. are present. Calculation of MNI is displayed in Table 39.

6.7.3 Summary. The fragmentary nature of faunal remains and the presence of cut marks on some specimens indicates that this area was the site of butchering activities on animal remains which were apparently transported here from a kill site of presently unknown location. Remains are extremely sparse and scattered in level 7. Maps of the distribution of individual artifacts are given in Figures 32 and 33. Choroplethic maps of artifact density by number per square meter are given in Figures 34 and 35. These indicate that the most dense accumulation of lithic artifacts in the excavated area occurred at the north end of excavation unit B and faunal remains were most concentrated in excavation unit C.

TABLE 38: Total Inventory of Faunal Remains, Complete and Fragmentary for Level 7.

BISON:	Element	Number	Percentage
	1. Cranium		
	2. Mandible	103	9.1
	3. Hyoid		
	4. Misc. Loose Incisor/Canine	2	0.2
	5. Misc. Loose Premolar/Molar	14	1.2
	6. Misc. Tooth Frags.		
	7. Atlas		
	8. Axis		
	9. Cervical Vertebra (3-7)	4	0.4
	10. Thoracic Vertebra (1-14)	1	0.1
	11. Spinous Process	1	0.1
	12. Lumbar Vertebra (1-5)		
	13. Sacrum		
	14. Caudal Vertebra		
	15. Unident. Vertebra Frags.		
	16. Rib	33	2.9
	17. Sternum		
	18. Scapula	3	0.3
	19. Humerus	2	0.2
	20. Radius	2	0.2
	21. Ulna	1	0.1
	22. Radial Carpal	6	0.5
	23. Ulnar Carpal	2	0.2
	24. Internal Carpal		
	25. Unciform Carpal	1	0.1
	26. Accessory Carpal	2	0.2
	27. Fused 2nd/3rd Carpal	2	0.2
	28. Metacarpal	6	0.5
	29. Ischium	2	0.2
	30. Ilium		
	31. Pubis		
	32. Innominate Frags.		
	33. Femur	2	0.2
	34. Patella		
	35. Tibia	4	0.4
	36. Tibial Tarsal	5	0.4
	37. Calcaneous	2	0.2
	38. Lateral Malleolus		
	39. Fused 2nd/3rd Tarsal		
	40. Fused Central/4th Tarsal	4	0.4
	41. Metatarsal	9	0.8
	42. Metapodial Frags.		
	43. First Phalanx	8	0.7
	44. Second Phalanx	6	0.5
	45. Third Phalanx	5	0.4
	46. Inferior Sesamoid		
	47. Sesamoid		
	48. Unident. Bone Frags.	899	79.6
	TOTAL =	1,129	100.1

NON-BISON FAUNAL REMAINS:

Species	Element	Number
Canis sp.	Cervical Vertebra	3
Canis sp.	Carpal	1
Canis sp.	Molar	1
White-tailed Deer	Tibia	1

TABLE 39: Calculation of Minimum Number of Individuals for Bison in Level 7.

Element	Side	Number	MNI
1. Metacarpal	1L 1R	2	1
2. Fused 2nd/3rd Carpal	1L 1R	2	1
3. Unciform Carpal	1L	1	1
4. Radial Carpal	1L 2R	3	2
5. Ulna	1R	1	1
6. Radius	1L	1	1
7. Fused 2nd/3rd Tarsal	1R	1	1
8. Fused Central/4th Tarsal	2L 1R	3	2
9. Tibial Tarsal	2L 3R	5	3
10. Tibia	1L	1	1
11. Femur	1R	1	1
12. Ischium	1L	1	1

MNI = 3

FIGURE 34
LEVEL 7
Density of Lithic Artifacts

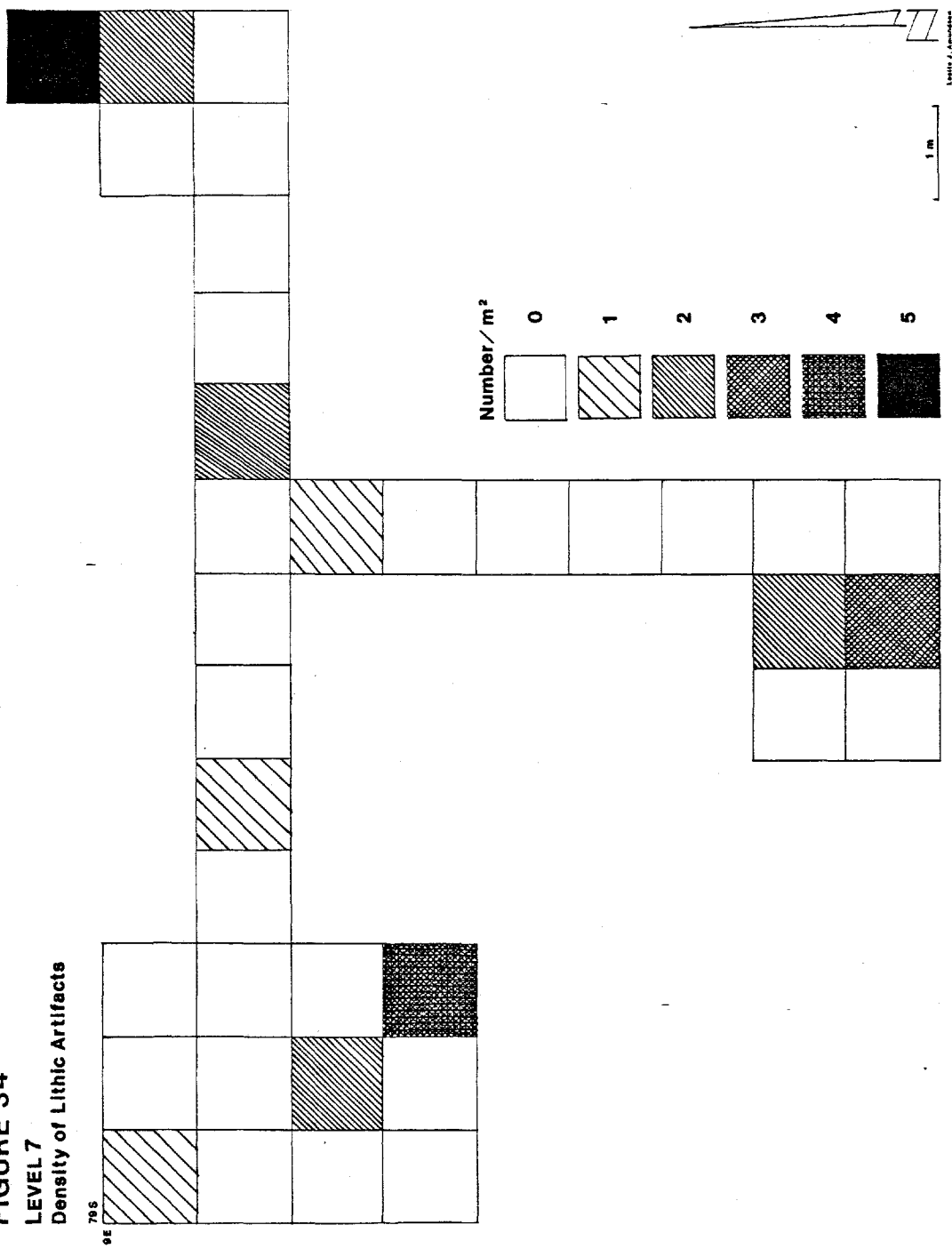
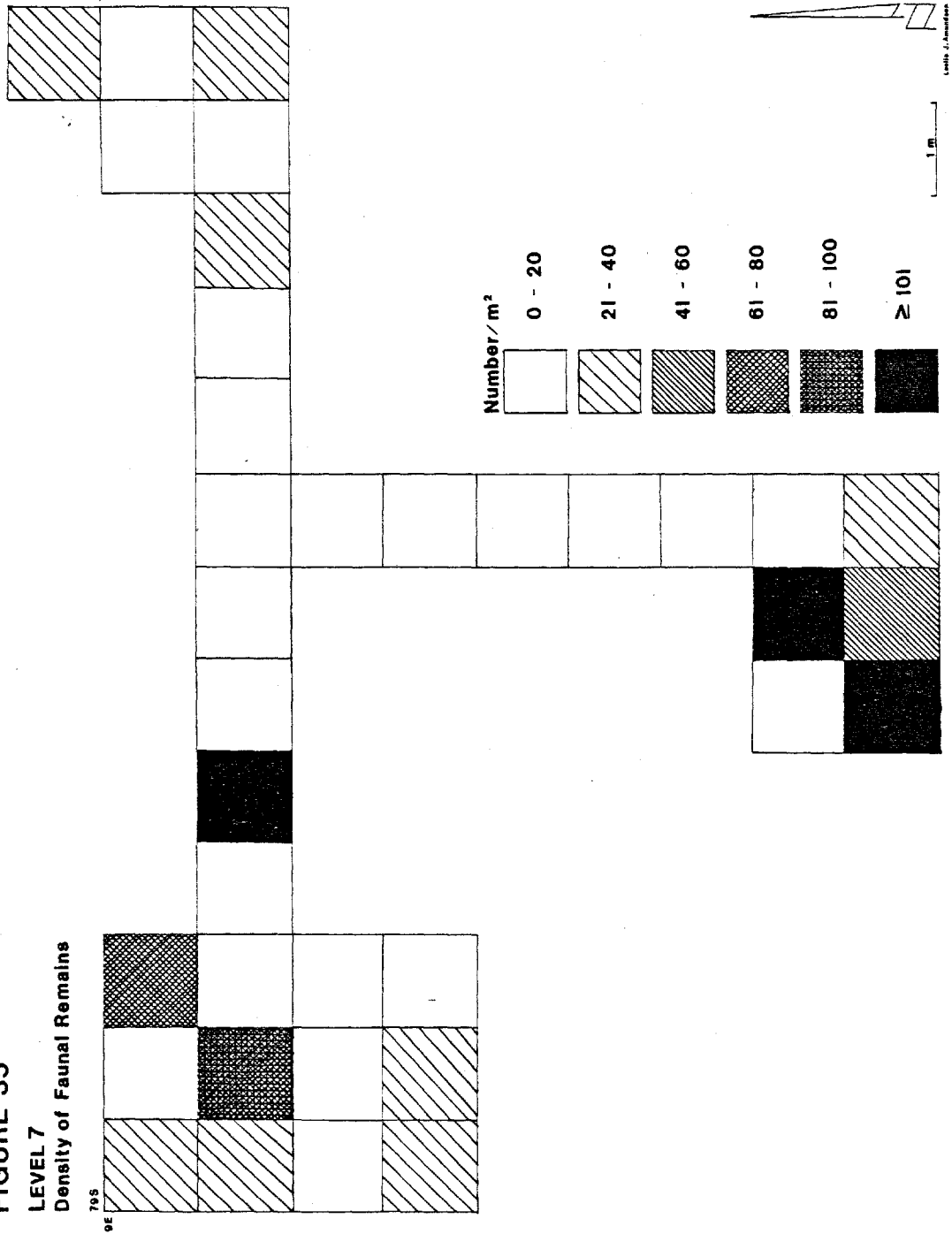


FIGURE 35
LEVEL 7
Density of Faunal Remains



7.0 SUMMARY AND CONCLUSIONS

7.1 Intra-site Comparisons

Before discussing the Amisk site and its place in the study of the prehistory of southern Saskatchewan, some of the differences and similarities between cultural occupations within the site will be highlighted to indicate the presence and character of changes in resource utilization and other activities through time.

7.1.1 Lithic Assemblages. Lithic Raw Materials. A total of 13 lithic raw material types were identified during excavations of all levels at the Amisk site. They are as follows:

TABLE 40: Total Inventory of Lithic Raw Materials
at the Amisk Site.

MATERIAL	NUMBER	PERCENTAGE
Fine-Grained Quartzite	1,324	26.20
Chert	1,261	24.90
Quartz	776	15.30
Swan River Chert	683	13.50
Medium-Grained Quartzite	380	7.50
Chalcedony	259	5.10
Fine-Grained Igneous	175	3.50
Coarse-Grained Quartzite	63	1.20
Petrified Wood	44	0.90
Welded Volcanic Tuff	35	0.70
Jasper	34	0.70
Fused Shale	21	0.40
Obsidian	2	0.03
TOTAL	5,057	99.93

It can be seen that fine-grained quartzite is the most common type of lithic material which was used at the Amisk site. The abundance of this material is probably related to its availability in the immediate area in the form of glacial erratics. In fact, all of the most common materials are locally available in this form. The least abundant material, obsidian, is not a local type. One obsidian flake was found in level 1, a Plains Side-Notched occupation and the other in level 5, an Oxbow complex occupation.

Chipped Stone Items. 12 categories of chipped stone items were identified at the Amisk site. They are as follows:

TABLE 41: Total Inventory of Chipped Stone Items at the Amisk Site.

ARTIFACT TYPE	NUMBER	PERCENTAGE
Shatter	3,529	69.80
Flake	1,434	28.40
Projectile Point	23	0.50
Bifacial Knife	19	0.40
Endscraper	16	0.30
Retouched Flake	14	0.30
Hammerstone	7	0.10
Sidescraper	2	0.04
Utilized Flake	2	0.04
Chopper	1	0.02
Preform	1	0.02
TOTALS	5,057	99.92

The vast majority of chipped stone items is made up of debitage with 98.2% of the total. The remaining 1.8% represents the stone tools found at the Amisk site. Over half of these were recovered from level 1 whereas no stone tools were found in levels 6 and 7. There does not appear to be any

significant concentration of a specific tool type in any one level nor is there any significant concentration of a specific tool type in a limited area within any occupation level. In other words, all of the tool types, that occur with any frequency, are found in each of the upper 5 cultural levels at the Amisk site and are widely distributed within each level. This suggests that activities related to specific tool types are not segregated areally or temporally. Apart from numbers of items, in fact, there appears to be a relative homogeneity in the lithic assemblages of each level, which indicates that similar activities occurred in each occupation. Differences arise from a combination of length of occupation, the intensity with which each activity was pursued and the number of people occupying the site area. This is best demonstrated in the trend toward increasing numbers of lithic items in each level from most ancient to most recent:

TABLE 42: Total Numbers of Lithic Artifacts
at the Amisk Site.

LEVEL	NUMBER	PERCENTAGE
1	3,031	59.70
2	827	16.30
3	521	10.30
4	415	8.20
5	169	3.30
6	94	1.90
7	24	0.50

This trend is likely representative of a combination of possible factors including: greater time spent at the site; a higher degree of activities with lithic materials; or a larger population of people inhabiting the site in more recent occupations as compared with more ancient ones. Any one of

these or any combination of these factors would allow the accumulation of more artifacts in the same area.

7.1.2 Faunal Assemblage. A trend similar to that described above in the lithic assemblage is also evident in the faunal assemblage of the Amisk site. That is, with one exception, there is an increase in the number of bone and tooth fragments in each level and therefore an increase in the relative density of these items from the most ancient to the most recent. The totals are as follows:

TABLE 43: Total Numbers of Faunal Remains at the Amisk Site.

LEVEL (Bison)	NUMBER	PERCENTAGE	MNI
1	20,190	43.90	4
2	2,851	6.20	2
3	8,258	18.00	4
4	8,090	17.60	4
5	4,285	9.30	6
6	1,150	2.50	2
7	1,135	2.50	3

The exception to this trend is level 2 but apart from that there is a significant increase in the number of faunal remains from oldest to youngest occupations. This increase in absolute numbers of bone and tooth fragments is not, however, directly proportional to an increase in the minimum number of bison in each level. In fact, the MNI is remarkably constant with a mean of 3.57 and a standard deviation of 1.29. This demonstrated by the fact that level 7, with the smallest number of bone fragments, has an MNI for bison of 3 while level 1, with the most bone fragments, has an MNI for bison of 4. The relative accumulation of faunal remains in each level

does not, therefore, reflect the number of bison carcasses in the excavated area, but rather is dependent on either the degree of fragmentation of bone or the spatial distribution of faunal remains in the site area. Again using levels 7 and 1 as examples, it can be seen that the remains of 3 bison carcasses are widely and sparsely scattered throughout the site with only a few bones represented in the excavated area. In level 1, however, the remains of 4 bison carcasses are concentrated largely within the excavated area in a much more fragmented condition. This suggests that were a greater area of the Amisk site exposed there would be a higher MNI for bison in level 1 than in level 7. This supports the assumption that the upper levels saw a combination of longer occupations, more people and more intense activities than lower levels.

Bison is, by far, the most common species represented in the faunal assemblages of each cultural level. Of a total of 45,960 bone and tooth fragments, 45,843 or 99.75%, are bison. The other 117 fragments are the remains of 8 other species including Unio sp. (clam), Canis sp., antelope, white-tailed deer, beaver, ground squirrel, bird and fish. It can be assumed that, in each occupation, people were almost entirely dependent upon bison hunting as a source of meat and other animal by-products.

Apart from numbers of items, the overall character of each occupation is quite similar. The occurrence of lithic

debitage in each level indicates that core reduction and tool making and repair was an activity common to all of the occupations. The presence of most types of stone tools in each of the upper 5 levels suggests that, again, activities related to these tools were common to each level. Unarticulated, scattered and fragmented bison remains showing evidence of cutting and deliberate breakage indicate that the food processing activities in each level were quite similar. It is evident in each occupation that the Amisk site was not a place where bison were killed but rather the site of the final stages of food processing on remains transported to the site from a kill and primary butchering site. The presence of a number of hearth features and fire-cracked rocks from various levels is indicative of cooking activities in each occupation as well. With the range of activities described above occurring at each level, the best general category or type of site in which the Amisk site can be included is that of a campsite.

7.2 The Amisk Site in the Prehistory of Southern Saskatchewan

7.2.1 The Cultural Assemblage.

The Amisk site is a multi-component campsite with a cultural stratigraphy spanning a large part of the prehistory of Saskatchewan and the Northern Plains from the Middle Plains Indian period to recent prehistoric time. Only two cultural complexes are represented by diagnostic artifacts at the Amisk

site. These are the Oxbow complex in levels 4 and 5 and the Late Side-Notched Series in level 1.

A number of Oxbow complex campsites have been excavated in southern Saskatchewan providing an extensive comparative collection with which to examine newly recovered materials. One fragment of an Oxbow type projectile point (Plate 12, a) was discovered in level 5 at the Amisk site. It is, however, too incomplete to be useful in comparisons with points found in other areas of Saskatchewan. A small, nearly circular endscraper made on a split, black chert pebble (Plate 12, b) found here is similar to one from the Harder site (Dyck 1970).

A better sample of Oxbow projectile points was recovered from level 4. Of the seven discovered, six are identifiable as Oxbow type. The seventh is missing the basal area but is assumed to be Oxbow type as well. FbNp-17-5140 and FbNp-17-4959 (Plate 12, row 1 b and d; Figure 21, b) are medium sized, chert points with wide side-notches and deeply concave bases. These items closely resemble specimen 121.7 from the Gray site, a burial site northwest of Swift Current, Saskatchewan (Millar 1978). They are also similar to a number of points from the Harder site (Dyck 1977). FbNp-17-5055 (Plate 12, row 1a; Figure 21, a) is a slightly larger projectile point than those mentioned above. It too has wide side-notches but a less extremely concave basal edge. The body of the point is long with only slightly convex lateral edges. Points of this type can be seen from level 8 of the

Long Creek site (Wettlaufer and Mayer-Oakes 1960), the Harder site (Dyck 1977), and the Gray site (Millar 1978). A similar point was also recovered from the Moon Lake site which is an Oxbow habitation in the sand hills west of Saskatoon (Dyck 1970). Finally, at the Amisk site, there are two points, FbNp-17-6122 and FbNp-17-6137 (Plate 12, row 1 c and e; Figure 21, c), which again have wide side-notches but little or no basal concavity. A point similar to these was found at the Moon Lake site (Dyck 1970). A projectile point preform (Plate 12, row 1h; Figure 21, d), similar to a number of those from the Harder site (Dyck 1977), was also found in level 4 at the Amisk site.

The three endscrapers (Plate 12, row 2 a,b and c; Figure 21, e, f and g) found in level 4 are all small, thin and roughly quadrilateral in planview with smooth, flat dorsal surfaces. Examples of this type of endscraper come from level 6 of the Long Creek site (Wettlaufer and Mayer-Oakes 1960) and from the Harder site (Dyck 1977).

The above comparisons indicate that the Oxbow complex cultural assemblage at the Amisk site fits well into the general Oxbow assemblage in southern Saskatchewan. Homologues of various tool types were found in the southeast, southwest and central parts of the province. Like other Oxbow sites which have been excavated on the Northern Plains the Amisk site is a campsite in which the processing of bison remains

was a dominant activity.

Level 2 at the Amisk site yielded very few tools and no diagnostic artifacts. A bone projectile point (Plate 9, a; Figure 11, a) is an uncommon discovery on the Northern Plains. A review of available literature showed no comparable items. On the other hand, level 2 has one of the most common and widespread archaeological features found on the Northern Plains according to Quigg and Brumely (1984), that is, a stone circle or tipi ring. This stone circle, at 3 m in diameter, is at the small end of the range of 2.2 m to 9.5 m suggested by Quigg and Brumley (1984). Time constraints prevented the complete exposure of this feature, however, the excavated area revealed bison bone, lithic debitage and small cobbles in and about the stone circle. The presence of a stone circle suggests the use of a tipi structure as a dwelling at the site (Quigg and Brumley, 1984). This evidence supports the interpretation of the Amisk site as a habitation area. Similar features can be seen in the immediate area at the Meewasin Creek site, the Cut Arm Creek site and the Sunburn Tipi Ring site in the Wanuskewin Heritage Park (Walker 1983).

Level 1 at the Amisk site represents at least two and as many as three occupations. This is indicated by the presence of Plains Side-Notched projectile points and late prehistoric pottery and of Prairie Side-Notched and late Avonlea projectile points which are possibly contemporaneous, representing a transitional type between the two (Adams 1977).

Radiocarbon assays of bone collagen and charcoal have yielded three ages: 480 +/- 65 years, 635 +/- 85 years and 905 +/- 155 years. This appears to favor the presence of three occupations. The most recent age corresponds with the accepted time-frame for Plains Side-Notched in Saskatchewan while both of the more ancient ages can be associated with Prairie Side-Notched (Dyck 1983). Ages from Avonlea components in Saskatchewan including Estuary Bison Pound (Adams 1977), Yellow Sky (Wilson-Meyer and Carlson, 1984) and Gravel Pit (Klimko n.d.) also compare favorably with the age of 905 +/- 155 years.

FbNp-17-3535 (Plate 7, row 1e) is an Avonlea projectile point made of brown chalcedony. It is a triangular point with wide, "U-shaped" side-notches that so closely approach the basal edge that it, in fact, appears to be corner-notched. The basal edge is slightly concave. Examples of this type of point can be found at the Long Creek site, level 1B (Wettlaufer and Mayer-Dakes 1960), layer 24 of the Gull Lake site in southwestern Saskatchewan (Kehoe 1973), in level I of the Estuary Bison Pound site, a bison kill site in southwestern Saskatchewan (Adams 1977) and at the Bakken Wright site, a bison jump on a terrace of the Frenchman River. The second Avonlea point, FbNp-17-3176, which could be described as being a transitional form between pure Avonlea and pure Prairie Side-Notched (Meyer 1986: personal communication) is larger with small side-notches more removed from the slightly concave basal edge. Points of this type can

be found in level II of the Estuary Bison Pound site (Adams 1977) and in layer 26 at the Gull Lake site (Kehoe 1966).

A Prairie Side-Notched point, FbNp-17-2841, is crudely made from fine-grained quartzite. The point is asymmetrical with convex sides and wide, uneven side-notches. The basal edge is straight. Similar points can be seen in the level II assemblage of the Estuary Bison Pound site (Adams 1977), the Tschetter site (Prentice 1983) and level 1-2 at the Garratt site, a late prehistoric site on a flood plain of Moose Jaw Creek (Morgan 1979). The second Prairie Side-Notched specimen is also made of brown chalcedony. It has small "U-shaped" side-notches very low on the body leaving a narrow basal area. This type can be seen at the Estuary Bison Pound site, level II (Adams 1977) and at the Tschetter site (Prentice 1983).

The Plains Side-Notched type points from level 1 at the Amisk site are relatively consistent in morphology. They are triangular points with "U-shaped" side-notches that are well separated from the basal edge. Points of this type also occur at the Mortlach site (level 1), a multi-component campsite in south central Saskatchewan (Wettlaufer 1955), at the Long Creek site (level 1A) (Wettlaufer and Mayer-Oakes 1960), and at the Gull Lake site (Kehoe 1966).

The above comparisons indicate that the cultural assemblage of level 1 at the Amisk site fits well into the general Late Plains Indian assemblage in Saskatchewan.

7.2.2 Chronology and Geography.

Culturally diagnostic artifacts from three levels of the Amisk site reveal the presence of cultural complexes identified at numerous sites on the Northern Plains. These include the Plains Side-Notched complex as well as late Avonlea and Prairie Side-Notched, which are possibly contemporaneous (Meyer: personal communication 1986, Adams 1977) from the Late Plains Indian Period and the Oxbow complex from the Middle Plains Indian Period. Small scale comparisons, at the artifactual level, have been made with other sites bearing these cultural complexes. What remains is the comparison of sites on a larger scale taking into consideration such attributes as chronology, geography and general site character. Although no culturally diagnostic artifacts have been recovered from level 7 at the Amisk site, a radiocarbon age of 5,340 +/- 120 years suggests that this occupation is earlier than the accepted time-frame for the Oxbow complex (Dyck 1983). This age is similar to one from the Beaver Creek site which is located on the bank of the South Saskatchewan River approximately 20 km south of Saskatoon (Walker: personal communication 1986). The Beaver Creek site also lacks culturally diagnostic artifacts, but along with cultural level 7 at the Amisk site, bridges the time between the Mummy Cave series, as represented by the

Gowen site in Saskatoon, and the Oxbow complex (Walker: personal communication 1986).

Sites of the Oxbow Complex. The Oxbow complex was first identified as a result of excavations at the Oxbow Dam site on the Souris River in southeastern Saskatchewan (Nero and McCorquodale 1958). Wettlaufer and Mayer-Dakes (1960) soon found a stratified series of Oxbow components at the Long Creek site which is a short distance west of the Oxbow Dam site on a tributary of the Souris River. Faunal samples from such sites as Long Creek, Oxbow Dam, Harder and Moon Lake indicate that the Oxbow people were predominately bison hunters. However, only campsites and burial sites have been found associated with the Oxbow complex. The lack of kill sites leaves the discussion of bison procurement by these people speculative at best. This deficiency in knowledge may be a result of sampling error or, perhaps, a reflection of a bison procurement strategy, which did not employ mass kill techniques, the remains of which have not been recognized as such by archaeologists.

Possibly the most extensively excavated Oxbow component is at the Harder site in the Dunfermline Sandhills northwest of Saskatoon and about 25 km west of the Amisk site. As a result of these excavations Dyck (1977) has been able to comment on the demographic character of the Oxbow complex. He has estimated that the Oxbow site was occupied by 42 to 56

people for a period of 21 to 42 days. A group such as this may be described as a band. A band, according to Sharer and Ashmore (1979) is a small hunting and gathering group which lives in no one settled campsite but, rather, follows a seasonal migration pattern which corresponds to the availability of resources.

The limited area of excavation at the Amisk site (40 square meters) prevents speculation about and comparison of demographic character of the Oxbow components. No human remains were discovered at the Amisk site and therefore no further contribution can be made to the understanding of the biological character of the Oxbow People. The faunal assemblage, however, being greater than 99% bison in the Oxbow components at the Amisk site supports the assertion that these people were primarily bison hunters.

The Oxbow components at the Amisk site have each had radiocarbon assays of bone collagen (Walker, Amundson and Kelly 1985). Levels 4 and 5 both yielded Oxbow projectile points while level 6, though lacking any culturally diagnostic artifacts, dates closely with the definite Oxbow components and is assumed to be a third Oxbow component. The comparison of radiocarbon ages in this thesis is done always with the inclusion of the standard deviation. Radiocarbon ages are published with the first sigma range. That is, in 95 percent of cases the radiocarbon assays will be correct within the range determined by adding and subtracting the value of the

standard deviation from the age given. In other words, a radiocarbon age may be any one within the reported range and not necessarily the given, central figure. If one were to compare radiocarbon ages without considering the standard deviations overlapping ages may be overlooked. The ages are as follows:

TABLE 44. Radiocarbon Ages of Oxbow Components at the Amisk Site.

LEVEL 4 (S-2536)	4015 +/- 195 years.:	2065 B.C.
	Range including standard deviation =	2260 B.C. - 1870 B.C.
LEVEL 5 (S-2535)	4120 +/- 190 years.:	2170 B.C.
	Range including standard deviation =	2360 B.C. - 1980 B.C.
LEVEL 6 (S-2534)	3895 +/- 195 years.:	1945 B.C.
	Range including standard deviation =	2140 B.C. - 1750 B.C.

Maximum probable range of Oxbow occupation = 2360 B.C - 1750 B.C.

The age for level 6 is apparently anomalous being at a lower stratigraphic level with a more recent radiocarbon age. However, if the standard deviations of each age are considered, all three components partially overlap in time. The ages compare favorably with radiocarbon ages from other Oxbow components in Saskatchewan (Table 45).

The age range for the Oxbow components at the Amisk site makes it roughly contemporaneous with the Moon Lake site (Dyck 1970) which is about 20 km southwest of the Amisk site on an abandoned bank of the South Saskatchewan River, the Newo Asiniak site (Walker, Amundson and Kelly 1985) which is immediately adjacent to the north side of the Amisk site in the Tipperary Creek valley, and with some of the burial units

TABLE 45. Radiocarbon Ages of Oxbow Components in Saskatchewan.

SITE NAME	RADIOCARBON AGE	MAXIMUM AGE RANGE (Calendar years plus standard deviation)
Amisk FbNp-17	S-2534 3895 +/- 195	2360 B.C. - 1750 B.C.
	S-2535 4120 +/- 190	
	S-2536 4015 +/- 195	
East Pasture EcNx-4	S-637 4235 +/- 55	2230 B.C. - 2340 B.C.
	S-619 4955 +/- 165	
Gray Burial EcNx-1a	S-646 3755 +/- 100	3540 B.C. - 880 B.C.
	S-647 5100 +/- 390	
	S-693 3550 +/- 295	
	S-706 3485 +/- 195	
	S-707 3750 +/- 180	
	S-1449 2915 +/- 85	
	S-1450 3415 +/- 105	
Greenwater Lake FcMv-1	GX-3373 4340 +/- 250	2545 B.C. - 2335 B.C.
	S-1447 4390 +/- 105	
Harder FbNs-1	S-490 3360 +/- 60	1580 B.C. - 1350 B.C.
	S-668 3425 +/- 105	
Kisbey DjMq-3	S-2251 3145 +/- 85	1280 B.C. - 1110 B.C.
Long Creek DgMr-1	S-50 4620 +/- 150	3165 B.C. - 2520 B.C.
	S-52 4620 +/- 80	
	S-53 4650 +/- 150	
	S-54 5000 +/- 125	
Moon Lake FaNq-5	S-403 4100 +/- 90	2240 B.C. - 2060 B.C.
Newo Asiniak FbNp-16	S-2532 4320 +/- 85	2455 B.C. - 2280 B.C.
Oxbow Dam DbNr-1	S-44 5200 +/- 130	3380 B.C. - 3120 B.C.
St. Brieux FdNf-2	S-520 4985 +/- 75	3110 B.C. - 2960 B.C.

References: Wilmeth 1978, Walker 1984, Walker, Amundson and Kelly 1986.

at the Gray site (Millar 1978) in southwestern Saskatchewan which was repeatedly used in its special capacity as a burial ground throughout the Oxbow period. It can also be seen that the Oxbow components at the Amisk site are well within the range of published ages and do not challenge the most ancient or most recent limits.

Spurling and Ball (1981) in a comparative and quantitative analysis of Oxbow components on the Northwestern Plains found that published ages for these components can be organized into five classes and that ages represented by these classes generally decrease with an increase in latitude. The following table displays these five classes. The ages are given in calendar years for purposes of comparison with the ages mentioned above.

TABLE 46. Class Limits for Radiocarbon Ages of Oxbow Components on the Northwestern Plains.

- 1) 535 B.C. - 1046 B.C.
- 2) 1046 B.C. - 1557 B.C.
- 3) 1557 B.C. - 2068 B.C.
- 4) 2068 B.C. - 2579 B.C.
- 5) 2579 B.C. - 3090 B.C.

Oxbow components at the Amisk site fit into classes 3 and 4. The location of the Amisk site corresponds with the latitudes in which sites of this age can be expected to be found according to the map of 21 Oxbow complex components, in which

the relationship between chronology and latitude is displayed, presented by Spurling and Ball (1981). The Amisk site data, in this respect, supports the chronological structure for Oxbow complex sites on the Northwestern Plains proposed by Spurling and Ball (1981) and suggests that this may be a useful model for future studies of this cultural complex.

Spurling and Ball (1981) have also attempted to categorize Oxbow complex sites based on attributes other than chronology and latitude. These attributes include: location; environment; features; lithic raw materials; faunal remains; artifact types; and human interments. From 32 Oxbow components studied they arrived at three site types which represent clusters of certain attributes. The first type has the following attributes: an association with a boreal forest environment which has been stable for the past 6500 years; a lake shore location; and a limited inventory of scrapers and Oxbow projectile points with quartzite being the dominant lithic raw material type. Sites of the second type share the presence of scrapers, bifaces and a predominance of chert as a lithic raw material type, streamside locales, boreal forest or transitional forest environments, projectile point preforms, choppers and the use of quartzite. Spurling and Ball suggest that these two site types may well correspond with Binford's (1980) description of the field camp; a temporary operational and locational locus for task groups aimed at specific local resources.

The third site type is characterized by: a grassland environment; the presence of bison; scrapers; culturally introduced, unmodified rocks; the use of chert; hearths; fire-cracked rock; cores; bifaces; preforms; the use of quartzite; and the presence of Knife River Flint. Spurling and Ball describe this site type as a grasslands residential base in Binford's (1980) terminology. The presence of unmodified rock, hearths and fire-cracked rock is suggested as an indication of an investment of time and effort in site preparation and of a stability of use. The diversity of lithic artifact types and the presence of cores suggests lithic manufacturing activities. The occurrence of exotic lithic raw materials such as Knife River Flint may indicate that this type of site was a locus in a trade network. Spurling and Ball place the Harder, Long Creek, Oxbow Dam, Moon Lake and Gray Burial sites in this site type. The Amisk site can be included in this list as it shares all of the attributes described above with these sites. Again, Spurling and Ball (1981) have provided a useful framework for the analysis and presentation of Oxbow sites.

The Amisk site shares environmental similarities with these other Oxbow complex sites beyond their collective occurrence in the grasslands. A common denominator among them, with the exception of the Harder site, is some association with streams, rivers, or channels, i.e., reliable sources of water. The Amisk site is in the Tipperary Creek valley adjacent to a small, presently ephemeral, meandering

stream which empties directly into the South Saskatchewan River. The Long Creek occupies a similar location adjacent to a meandering stream in the Long Creek valley which empties directly into the Souris River. The Oxbow Dam site occupies a terrace of the Souris River itself. The Moon Lake site is on an abandoned bank of the South Saskatchewan River overlooking an Oxbow lake. Finally, the Gray site is situated in an extinct outwash channel which connected an extinct lake with the Swift Current Creek valley which is a part of the larger South Saskatchewan River drainage system. Excavations at the Amisk site have, therefore, revealed a series of Oxbow complex components which are apparently quite typical in chronology, contents and geography.

Sites of the Late Plains Indian Period. Two lines of evidence, artifactual and chronological, suggest that level 1 at the Amisk site reveals at least two and possibly three separate occupations during the Late Plains Indian Period. Plains Side-Notched points and late style pottery indicate a Plains Side-Notched occupation. A charcoal age of 480 +/- 65 years supports this assertion. A mixture of late Avonlea and Prairie Side-Notched points along with a collagen age of 905 +/- 155 years suggests an occupation during the Avonlea/Prairie Side-Notched transition period similar to that described by Adams (1977). A possible third occupation is

indicated by a bone collagen age of 635 +/- 85 years which is both late for Prairie Side-Notched and early for Plains Side-Notched (Dyck 1983).

Sites in the Avonlea/Prairie Side-Notched Transition Period.

There are a number of sites in Saskatchewan which have this combination of projectile point types and that have radiocarbon ages similar to that of the Avonlea/Prairie Side-Notched component at the Amisk site. The opportunity to make large scale comparisons of site character is limited, however, by the fact that excavated sites of this complex are almost exclusively bison kill sites while the Amisk site is a habitation area. Bison kill sites in Saskatchewan with similar projectile point collections and/or radiocarbon ages include: the Tschetter site (Prentice 1983), a bison pound in the Dunfermline Sandhills northwest of Saskatoon; the Estuary Bison Pound site which is located at the head of a large coulee associated with the South Saskatchewan River valley northwest of Leader, Saskatchewan (Adams 1977); the Gull Lake site, a pound against the rim of an escarpment on the Missouri Coteau south of Gull Lake, Saskatchewan (Kehoe, 1973); the Bakken Wright site, a bison jump on a terrace of the Frenchman River (Adams 1975); and the Rousell site, a possible surround northwest of Saskatoon (Dyck 1983).

The appropriate topography for successfully driving and killing bison was undoubtedly a major factor influencing the

geographic location of these sites. A broad similarity can be seen, however, among these and the Amisk site. All sites are in some way associated large drainage systems such as the North and South Saskatchewan Rivers, the Frenchman River and Swift Current Creek.

Recent excavations at the Sheep Camp site, which is on a bank of the Saskatchewan River near Cabri, Saskatchewan, have revealed a projectile point assemblage which is described as transitional between Avonlea and Prairie Side-Notched and has yielded a radiocarbon age of 885 +/- 195 years: A.D. 1065 (Czakoff: personal communication 1986).

Considering the standard deviation of 155 years for the bone collagen age of 905, the Avonlea/Prairie Side-Notched occupation of the Amisk site most probably occurred between A.D. 890 and A.D. 1200. Sites in this age range in Saskatchewan and/or those which have Avonlea/Prairie Side-Notched components are listed in Table 47.

Sites of the Plains Side-Notched Complex. Pottery and projectile points from level 1 at the Amisk site indicate the presence of a Plains Side-Notched complex occupation which has been aged at 480 +/- 65 years: A.D. 1470. Including the standard deviation, this occupation most likely occurred between A.D. 1405 and A.D. 1535. According to Wilmeth (1978) only one excavated component in Saskatchewan has a radiocarbon age which falls in this range. This is the Walter Felt site

TABLE 47. Radiocarbon Ages for Selected Side-Notched Series Components in Saskatchewan.

SITE NAME	RADIOCARBON AGE		MAXIMUM AGE RANGE (Calendar years plus standard deviation)
Amisk FbNp-17	S-2537	905 +/- 155	A.D. 890 - A.D. 1200
Sheep Camp EeOc-3		885 +/- 195	A.D. 870 - A.D. 1260
	GaK-3809	1020 +/- 80	
Estuary Bison	S-641	1190 +/- 165	A.D. 595 - A.D. 1010
Pound EfOk-16	S-640	1070 +/- 70	
Glen Ewen Burial Mound DgM1-1	S-259	1110 +/- 90	A.D. 730 - A.D. 930
Gull Lake	S-150	1165 +/- 80	A.D. 650 - A.D. 865
EaOd-1	S-149	1220 +/- 80	
Moose Bay Burial Mound EdMg-1	S-453	910 +/- 70	A.D. 970 - A.D. 1110
Newo Asiniak FbNp-16	S-2529	750 +/- 70	A.D. 965 - A.D. 1270
Tschetter FbNr-1	S-669	1005 +/- 75	A.D. 870 - A.D. 1081
	S-1631	914 +/- 45	
Walter Felt EcNm-8	S-203	700 +/- 80	A.D. 1170 - A.D. 1330

References: Wilmeth 1978, Prentice 1983, Walker, Amundson and Kelly 1986 and Cazakoff 1986.

near Mortlach, Saskatchewan which has a charcoal age of 400 +/- 40 years: A.D. 1550. Considering the standard deviation, the possible range for the excavation of this layer is A.D. 1510 to A.D. 1590. The Walter Felt site includes both a bison kill and a habitation area. Kehoe (1966) writes that the upper five layers of this site have exclusively Plains Side-Notched projectile points. Another bison kill site in Saskatchewan with Plains Side-Notched components is the Gull Lake site. Here the top eight layers contain points of this type. Kehoe (1966) also excavated a Plains Side-Notched bison kill in Montana called the Boarding School Bison Drive. This site is roughly contemporaneous with the Plains Side-Notched occupation of the Amisk site at A.D. 1590 +/- 150. Including the standard deviation this site was most likely occupied between A.D. 1440 and A.D. 1740. The upper levels of this site have exclusively Plains Side-Notched points similar to those found at the Amisk site.

Unfortunately comparative data for habitation sites of the Late Plains Indian Period is noticeably lacking. This is largely due to the fact that the majority of excavated and published sites of this period are kills with the possible exception of the Sjo vold site (Dyck 1983) and the Garratt site (Morgan 1979). The Sjo vold site near Outlook, Saskatchewan is a multi-component campsite on a bank of the South Saskatchewan River. It remains, however, unreported at this time. The Garratt site is a multi-component campsite on a flood plain of Moose Jaw Creek. Its upper layer yielded Plains Side-Notched

points, late period pottery and a variety of chipped stone, cobble and bone tools. Its location in a small creek valley is analogous to that of the Amisk site. Another habitation site with multiple Plains Side-Notched occupations, which is presently the subject of a large research project, is the Tipperary Creek site (Walker personal communication). It occupies a point bar in the Tipperary Creek valley about 300 m down stream of the Amisk site.

Using Binford's (1980) terminology in the same manner as it is applied by Spurling and Ball (1981), the Late Plains Indian component at the Amisk site falls into one of two possible categories, the field camp or the residential base. The field camp is a site in which a task group lives while carrying out a specific resource utilization activity at a specific "location". On the Plains the most common example of this "location" where such exclusive activities occurred is the bison kill. The field camp associated with a location, according to Binford "is where a task group sleeps, eats and otherwise maintains itself while away from the residential base" (Binford 1980: 10). These activities would leave evidence of cooking (hearths, cooking pits), food processing (fragmented bone with cut marks) and tool repair (broken tools, retouch flakes).

The residential base, on the other hand, was the "hub of subsistence activities" (Binford 1980: 9). This site type will have remains of the full range of food processing and

preparation, manufacturing and maintainance activities. Differences between the field camp and the residential base will be of both degree and kind. While activities occur at both site types it is expected that there will be more and varied activities at the residential base. For instance, if the location with which a field camp is associated is a bison kill then it is likely that only bison remains will be found in that field camp as the task group went there specifically to kill bison. A residential base, however, will have the entire range of game exploited by the band. Another major difference is the presence of manufacturing activities at the residential base. A task group would likely arrive at a field camp with tools already prepared so that only evidence of sharpening and repair is likely to be found at a field camp. At the residential base, on the other hand, one should expect to find cores, core reduction flakes, general debitage and a variety of tool types in a variety of raw material types.

A comparison of the Late Plains Indian Period component at the Amisk site with Binford's site types suggests that this is a residential base rather than a field camp. Evidence in support of this includes: a wide variety of chipped stone and cobble tools indicating a variety of activities; cores an accumulation of debitage and 11 lithic raw material types indicating manufacturing activities; the presence of seven species, predominantly bison, in the faunal assemblage; and the highly fragmented state of bone suggesting that the final stages of food processing occurred here which in turn

indicates a separation in distance and/or time from the kill location.

Conclusion. The evidence presented here indicates that the Amisk site contains the remains of at least eight and possibly nine occupations over the past five millennia. A variety of subsistence activities occurred during these occupations such as food processing and preparation, tool making and tool repair. It has been demonstrated that this combination of activities is characteristic of a habitation area. The Amisk site, therefore, represents a series of camp sites adjacent to a small, meandering stream. In this respect the Amisk site can be seen as analogous with other stream side, stratified campsites in Saskatchewan such as the Long Creek site, the Mortlach site, the Garratt site, the Oxbow Dam site as well as a number of sites in the Tipperary Creek valley itself including the Newo Asiniak site and the Tipperary Creek site which are presently being studied. Artifactual and chronological evidence from the Amisk site supports and strengthens our understanding of the local cultural chronology with projectile points and radiocarbon ages which corroborate existing data from the Oxbow complex and the Late Side-Notched series.

7.3 Future Research Considerations for the Amisk Site

The study of the Amisk site presented in this thesis has brought to light a number of areas in which future research at

the site may be directed. First, as the present excavations represent less than one percent of the entire site area, an expansion of excavations in all areas of the site is necessary. This would aid in the resolution of a number of problems raised in this thesis. One of these is determining the exact number of occupations included in cultural level 1. Perhaps some stratigraphic separation will be apparent in other areas of the site. As well, an increase in the number of projectile points and pot sherds may indicate whether the Avonlea/Prairie Side-Notched transitional phase is represented here, a problem as yet unresolved at the Amisk site.

An increase in excavated area would also increase the chances of finding diagnostic artifacts in cultural levels 2, 3, 6 and 7. Of special interest is cultural level 7 with a radiocarbon age intermediate between the Mummy Cave series identified at the Gowen site and the Oxbow complex identified at the Amisk site and various other sites in Saskatchewan. The discovery of diagnostic artifacts here could potentially reveal something of the relationship between the Mummy Cave series and Oxbow complex.

More specific suggestions for future research include the following: excavations south and east of excavation unit A to completely expose the boulder alignment feature partially uncovered in both cultural levels 5 and 6; excavations north and west of excavation unit C to completely expose the stone circle partially uncovered in level 2; and the excavation of

a large block central to the landform in which the Amisk site is buried to test whether the present excavations, which are concentrated at the north edge of the landform, are peripheral to the area of greatest activity.

BIBLIOGRAPHY

- Acton D.F. and J.G. Ellis.
1978 The Soils of the Saskatoon Map Area 73-B Saskatchewan. Extension Division, University of Saskatchewan, Saskatoon.
- Adams, Gary F.
1975 The Bakken Wright Site: A Multi-component Bison Kill in Southwestern Saskatchewan. In, Salvage Contributions: Prairie Provinces, Roscoe Wilmeth, Editor, National Museum of Man Mercury Series No. 33: 133 - 199, Archaeological Survey of Canada, Ottawa.
- Adams, Gary F.
1977 The Estuary Bison Pound Site in Southern Saskatchewan. National Museum of Man Mercury Series No.68. Archaeological Survey of Canada, Ottawa.
- Beck, W.H.
1958 A Guide to Saskatchewan Mammals. Saskatchewan Natural History Society Special Publication No.1, Regina.
- Bergsteinsson, J.L. and J.G. Calvert.
1977 Climatological reference station annual summary 1977. Saskatchewan Research Council Report P78-4. Saskatchewan Research Council, Saskatoon.
- Binford, Lewis R.
1980 Willow smoke and dog's tails: hunter-gatherer settlement systems and archaeological site formation. American Antiquity 45(1):4-20
- Bird, R.D.
1961 Ecology of the aspen parkland of western Canada in relation to land use. Canada Department of Agriculture, Research Branch Publication 1066 , 1961.
- Brumley, J.H.
1974 The Cactus Flower Site in Southeastern Alberta: 1972-1974 Excavations. National Museum of Man Mercury Series No.60 , Archaeological Survey of Canada, Ottawa.
- Burley, D. and J. Finnigan.
1982 Nipawin Reservoir Heritage Study Volume 4: Operational and Analysis Guidelines. Saskatchewan Research Council Publication No. C-805-26-E-82, Saskatchewan Research Council, Saskatoon.
- Cazakoff, Ingrid
1986 The Sheep Camp Site (EeOc-3) Unpublished site report submitted on behalf the South West Saskatchewan Archaeological Society for the Archaeological Resource Management Section of Saskatchewan Culture and Recreation (Permit Number 84-24).

Chakravarti, A.K.

- 1969 The Climate of Saskatchewan. In Atlas of Saskatchewan. Edited by J.H. Richards and K.I. Fung. University of Saskatchewan, Saskatoon.

Christiansen, E.A. (editor)

- 1970 Physical Environment of Saskatoon, Canada. National Research Council, Saskatoon.

Dyck, Ian.

- 1970 Two Oxbow Settlement Types in Central Saskatchewan. Napao, A Saskatchewan Anthropology Journal. 2(2).

Dyck, Ian.

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

Dyck, Ian.

- 1980 "Initial work at the Sjøvold Site, Saskatchewan." Poster session at the 13th annual meeting of the Canadian Archaeological Association, Saskatoon, 1980.

Dyck, Ian.

- 1983 Prehistory of Southern Saskatchewan. In Tracking Ancient Hunters. Prehistoric Archaeology in Saskatchewan. Editors Henry T. Epp and Ian Dyck. Saskatchewan Archaeological Society, Regina.

Frison, George C.

- 1978 Prehistoric Hunters of the High Plains. Academic Press, New York.

Kehoe, T.F.

- 1966 The small side-notched point system of the Northern Plains. American Antiquity 31: 827 - 841.

Kehoe, T.F.

- 1973 The Gull Lake site: a prehistoric bison drive in southwestern Saskatchewan. Publication in Anthropology and History No.1. Milwaukee Public Museum, Milwaukee, Wisconsin.

Kehoe, T.F.

- 1974 The large corner-notched point system of the Northern Plains and adjacent woodland. In Aspects of Upper Great Lakes anthropology: papers in honor of Lloyd A. Wilford. Editor E. Johnson. Minnesota Historical Society, St. Paul.

- Klein, Richard, G. and Kathryn Cruz-Urbe.
1984 The Analysis of Animal Bones from Archaeological Sites.
University of Chicago Press, Chicago.
- Klimko, Olga.
1985 "New Perspectives on Avonlea: A View from the Saskatchewan Forest" in Contributions to Plains Prehistory Archaeological Survey of Alberta, Occasional Paper No. 26 Editor David Burley, Alberta Culture Historical Resources Division.
- The Landplan Collaborative Ltd.
1984 Tipperary Creek Conservation Area: Master Plan. Meewasin Valley Authority, Saskatoon.
- Laporte, Leo F.
1979 Ancient Environments. (2nd ed.) Prentice-Hall Inc., Englewood Cliffs.
- Leet, L. Don, Sheldon Judson and Marvin E. Kauffman.
1978 Physical Geology. (5th ed.) Prentice-Hall Inc., Englewood Cliffs.
- Linnamae, Urve.
1983 Features. In Tracking Ancient Hunters: Prehistoric Archaeology in Saskatchewan. Editors Henry T. Epp and Ian Dyck, Saskatchewan Archaeological Society, Regina.
- Meyer, D. and J. Prentice
1983 The Permanent Camp Site (FiNa-7): Final Report. In Nipawin Heritage Study, Volume 6: 1982 Final Excavations: The Permanent Camp, Minnie and Lloyd Sites. Saskatchewan Research Council Publication No. E-903-6-E-83. Saskatchewan Research Council, Saskatoon.
- Meyer, D.
1985 A Component in the Scottsbluff Tradition: Excavations at the Niska site. Canadian Journal of Archaeology Vol.9(No.1)1-37.
- Millar, J.F.V.
1978 The Gray Site: An Early Plains Burial Ground. Parks Canada Manuscript Report No.304 (2 Volumes), Ottawa.
- Millar, J.F.V.
1981 Introduction. The Oxbow Complex: A C.A.A. Symposium. Canadian Journal of Archaeology No.5: 83 - 88.

Morgan, R.G.

1979 An ecological study of the Northern Plains as seen through the Garratt site. Occasional Papers in Anthropology No.1, Department of Anthropology, University of Regina, Regina, Saskatchewan.

Nero, R.W. and B.A. McCorquodale

1958 Report on an excavation at the Oxbow Dam site. The Blue Jay. 16: 82 -90.

Pendree, E.

1980 The Bracken Cairn burial: an update. Saskatchewan Archaeological Society Newsletter 1 (2): 3.

Prentice, Jean.

1983 The Tschetter Site: A Study of a Late Prehistoric Bison Kill. Unpublished Master's Thesis, University of Saskatchewan, Department of Anthropology and Archaeology, Saskatoon.

Quigg, Michael J. and John H. Brumley.

1984 Stone Circles: A Review Appraisal and Future Directions. State Historical Society of North Dakota, Bismark.

Reeves, Brian O.K.

1969 The Southern Alberta palaeo-cultural, palaeo-environmental sequence. In Post-Pleistocene Man and His Environment on the Northern Plains. Editors R.C. Forbis, L.B. Davis, O.A. Christensen and G. Fedirchuck. University of Calgary Archaeological Association, Calgary.

Reeves, Brian, O.K.

1978 "Head-Smashed-In: 5500 years of bison jumping in Alberta Plains." In Bison Procurement and Utilization: A Symposium. Plains Anthropologist Memoir 14, 23(82)2.

Reeves, Brian O.K.

1983 Culture Change in the Northern Plains: 1000 B.C.- A.D. 1000. Archaeological Survey of Alberta, Occasional Paper No. 20. Alberta Culture Historical Resources Division.

Richards, J. Howard and K.I. Fung. (editors).

1969 Atlas of Saskatchewan. University of Saskatchewan, Saskatoon.

Richards, J. Howard.

1969 Physical Features of Saskatchewan. In Atlas of Saskatchewan.
Editors J. Howard Richards, and K.I. Fung. University of
Saskatchewan, Saskatoon.

Schmits, L.J.

1978 The Coffey Site: Environmental and Cultural Adaptation at a
Prairie Plains Archaic Site. MCJA Special Paper No.1.
Midcontinental Journal of Anthropology 3 (1).

Selley, R.C.

1976 An Introduction to Sedimentology. Academic Press Inc.
New York.

Sharer, R.J. and W. Ashmore

1979 Fundamentals of Archaeology. The Benjamin/Cummings
Publishing Company, Inc. Menlo Park, California.

Speth, John D.

1983 Bison Kills and Bone Counts: Decision Making by Ancient
Hunters. University of Chicago Press, Chicago.

Spurling, B.E. and B.F. Ball

1981 On some distributions of the Oxbow "complex". Canadian
Journal of Archaeology. No.5: 89 - 102.

Strahler, Arthur N. and Alan H. Strahler.

1979 Elements of Physical Geography. John Wiley and Sons,
New York.

Walker, E.G.

1980 The Gowen Site: An Early Archaic Site On The Northern Plains.
Unpublished Ph.D. Dissertation, The University of Texas.

Walker, E.G.

1983 Archaeological Resource Assessment: The Tipperary Creek
Project. Westek Consulting, Saskatoon.

Walker, E.G.

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

Walker, E.G., Leslie J. Amundson and David L. Kelly

1986 Archaeological Investigations at the Wanuskewin Heritage
Park, 1985 Field Season. Unpublished interim report
manuscript.

Wettlaufer, B.N.

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

Wettlaufer, B.N. and W.J. Mayer-Oakes.

1960 The Long Creek Site. Anthropological Series No.2, Saskatchewan Museum of Natural History, Department of Natural Resources, Regina.