FbMi-5: AN ARCHAIC SITE
IN THE SWAN RIVER VALLEY, MANITOBA

A THESIS

SUBMITTED TO

THE FACULTY OF GRADUATE STUDIES AND RESEARCH

THE UNIVERSITY OF MANITOBA

IN PARTIAL FULFILLMENT

OF THE REQUIREMENTS FOR THE DEGREE

MASTER OF ARTS

BY

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OCTOBER 1973

ABSTRACT

FbMi-5 is a single component prehistoric campsite located near the toe of a Campbell Beach Ridge in the Swan River Valley of Manitoba, Canada. Basal peat from above the cultural horizon has been carbon-14 dated at 380 ± 130 B.C. (GSC #1380), providing an upper temporal limit for the occupation of the site. Projectile points found at the site are representative of an Archaic side-notched point tradition and bear affinities with those found at the Logan Creek, Simonsen, Turin, and Hill sites of Nebraska and Iowa, the Steeprock Lake site in Manitoba, and the Long Creek site in Saskatchewan.

ACKNOWLEDGEMENTS

I would like to acknowledge the support of my parents throughout my graduate years and their encouragement in the writing of this thesis. I extend my thanks to my advisor, Mr. Leo Pettipas, and the members of my committee: Mr. C. Amsden, Mr. L. Steen, and formerly Dr. C. T. Shay, for their guidance. The analysis of the non-archaeological material was done by D. Delorme, J. Elson, S. Macauley, J. McAndrews, N. Rutter, and M. Wilson. Credit for the cartographic work in this thesis goes to Mr. Peter Lockett, while Mr. Lorne Smith did the photography.

TABLE OF CONTENTS

CHAPTER | Page

LIST OF TABLES

Table		Page

LIST OF ILLUSTRATIONS

Figure Page

LIST OF PLATES

INTRODUCTION

Purpose of the Thesis

It is intended that this thesis will take the form of a site report on FbMi-5, an Archaic site in the Swan River Valley of Manitoba, Canada. Included are a description of the location of the site, a description of the artifacts, spatial and temporal comparisons with similar sites, and such paleoenvironmental reconstruction as is possible. Information gained from an examination of FbMi-5 will provide data about the prehistoric occupants of the site; may help to generate ideas about the early inhabitants of the Swan River Valley; and will add to what is known about the prehistory of the province and adjacent regions.

History of the Site

FbMi-5, as it is designated in the files of the Saskatchewan Museum, was discovered in the spring of 1961 by Mr. Eugene Gryba, a local amateur archaeologist. In 1960, following two dry years, a road had been constructed through a small spruce swamp, exposing the site. Gryba had then picked up artifacts and chipping detritus along the road cut the following spring.

In 1961 T. F. Kehoe, then Provincial Archaeologist for Saskatchewan, visited the site and excavated a hearth that had been partially destroyed during the road construction. The present writer was unable to obtain a report of the excavation done by Kehoe, and it is unclear as to whether or not the hearth was contemporaneous with the Archaic occupation of the site.

In 1965 and 1966 attempts were made by the Glacial Lake Agassiz Survey teams from the University of Manitoba to examine the site, but wet conditions at that time precluded excavation.

Subsequently, Gryba published a paper entitled "A Possible Paleo-Indian and Archaic Site in the Swan Valley, Manitoba" in Plains Anthropologist, in which he gave a report on the surface finds and speculated upon the temporal cultural relationships of the site with those in Saskatchewan and elsewhere on the northern plains (Gryba 1968).

The initial excavations at the site were conducted by Leo Pettipas in the summer of 1968. Funds for the work were provided by Dr. R. MacNeish, of the University of Calgary, from a grant from the National Research Council. During the summer Eugene Gryba served as an advisor and assistant to Pettipas. Katherine Pettipas and Angeline

Gryba made up the remainder of the crew.

The following summer of 1969 Gryba and his sister Angeline continued the excavation of FbMi-5 under a grant from Dr. W. J. Mayer-Oakes of the Department of Anthropology at the University of Manitoba. A wet summer, coupled with the poor natural drainage of the site, hampered work but a further artifact sample was obtained.

CHAPTER I

LOCATION AND PHYSICAL SETTING OF THE SITE

In this chapter the regional and local character of the Swan Valley will be described to provide a background for the description of the site itself. The following sections are not intended to serve as an exhaustive coverage and only pertinent points are summarily dealt with.

Location

The site is situated at 50°12' North Latitude and 101°25' West Longitude, in the NW ¼ of Sec. 18, Tp. 37, Range 28, West of the Principal Meridian. It stands at an elevation of 1160 feet a.s.l. and at the base of the Manitoba Escarpment which separates the First and Second Prairie Levels.

Bedrock Geology

The Swan River Valley is located in the west central portion of Manitoba (Fig. 1). It is of Tertiary age and was cut from the Cretaceous escarpment which is formed in part by the Porcupine and Duck Mountains. Subsequent

LOCATION OF THE SWAN RIVER VALLEY

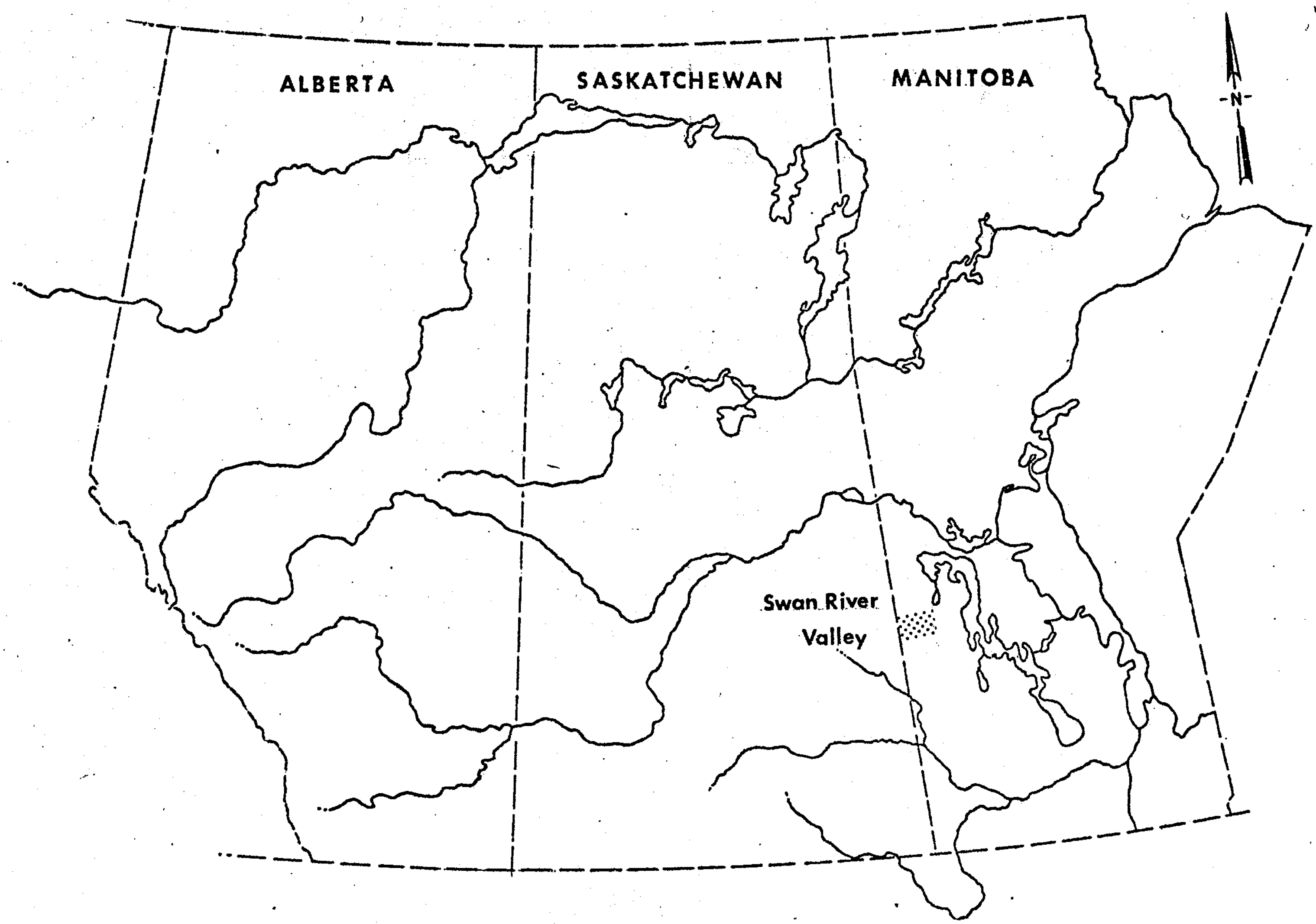


FIGURE 1

glaciation served to modify the relief of the valley, sharpening it along the escarpment and reducing it in adjacent areas with the deposition of glacial till (Rowe 1956:7). The Swan River area is primarily underlain by Cretaceous shales, except along Swan Lake where there is a narrow fringe of Devonian limestones and dolostones. The average depth of the valley below the escarpment is about 1,200 feet (Tyrell 1892:113) (Fig. 2).

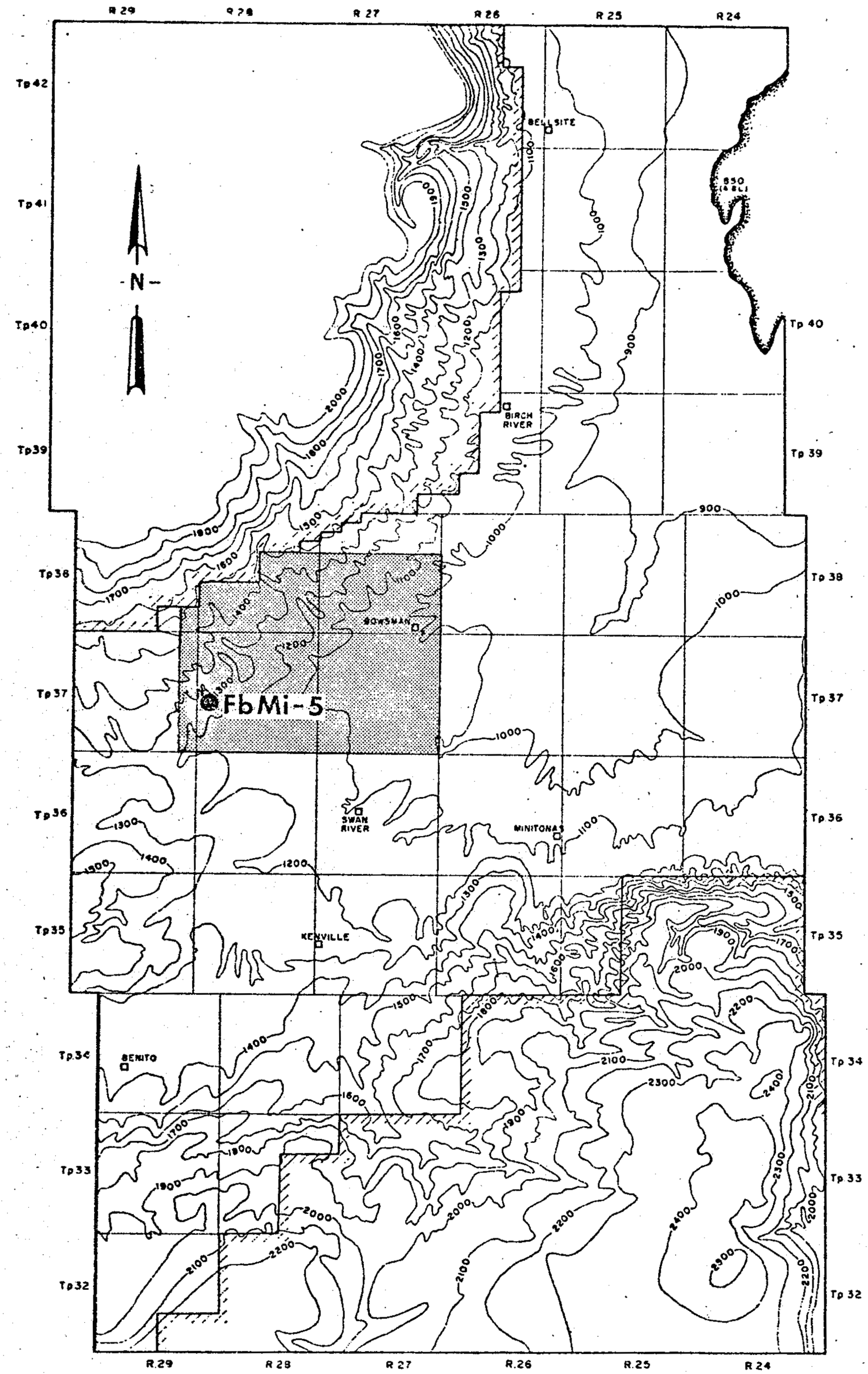
Surficial Geology

During the last glacial stage, the valley lay beneath the Laurentide ice sheet. As a result of glacial deposition, the bedrock is covered by a strongly calcareous glacial till. The glacial tills are made up of about equal portions of sand, silt, and clay, with smaller amounts of gravel, including metamorphic rocks from the Precambrian Shield, Cretaceous shales, and minor quartzite and chert pebbles (Klassen 1971:253). In some places the glacial till may occur as outcrops on ground moraines, while much of it has been further modified by glacial lake action. More recent surficial deposits include lacustral clays and sand, beaches, and alluvium (Fig. 3).

Glacial Lake Agassiz

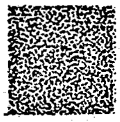
Concurrent with the recession of the last Wisconsin

CONTOUR MAP OF THE SWAN RIVER VALLEY

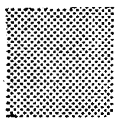


(After: Ehrlich, Pratt and LeClaire)

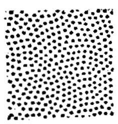
FIGURE 2



Beach Ridge

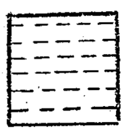


Ground Moraine

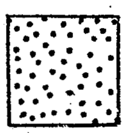


Hummocky Disintegration Moraine

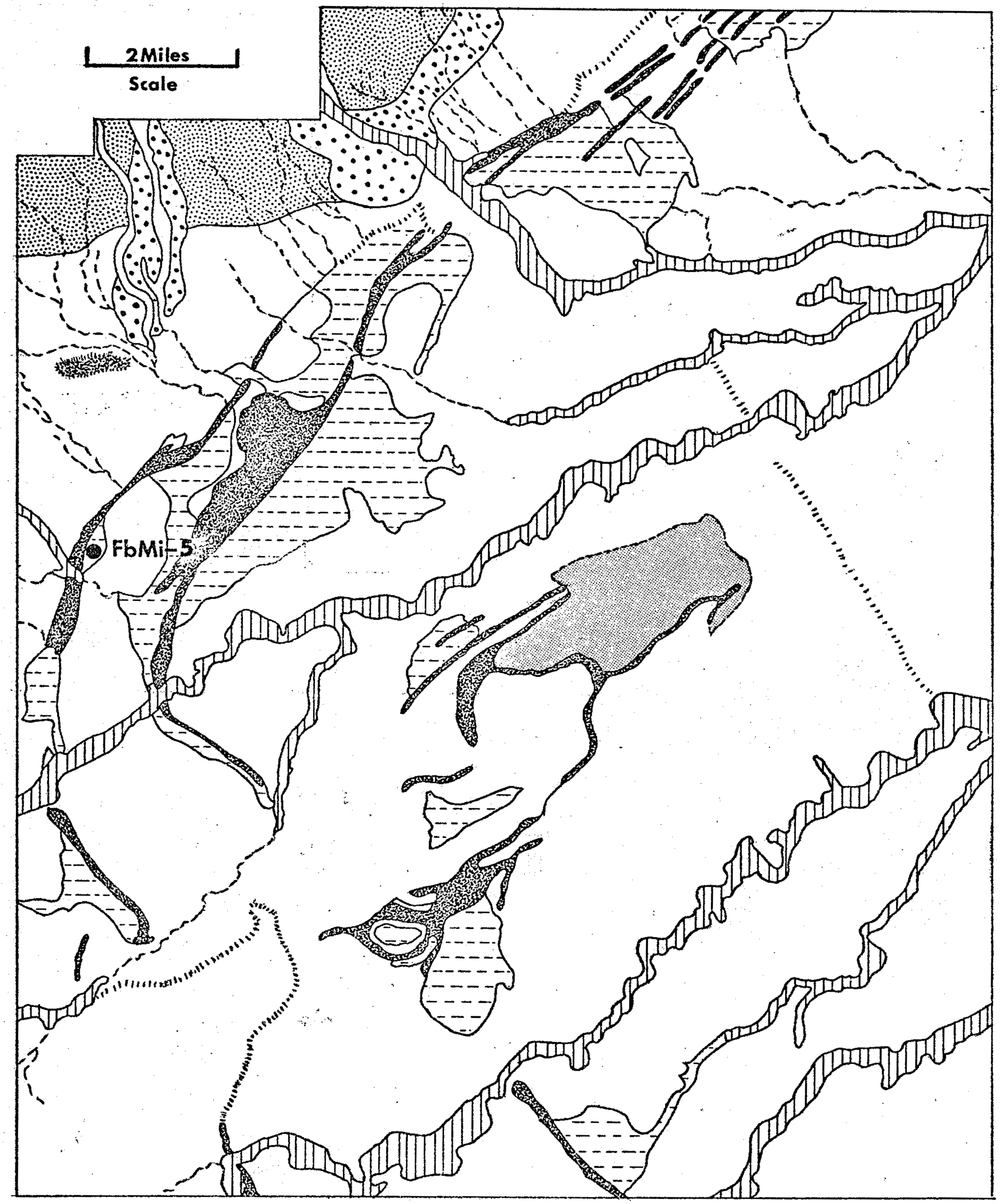
River Channel



Organic Soils



Outwash



SURFICIAL GEOLOGY MAP OF SHADED AREA ON FIGURE 2

FIGURE 3

ice sheet in Manitoba was the formation of Glacial Lake Agassiz. The lake formed from meltwater which was prevented from draining to the north by the presence of the diminishing ice front. Glacial Lake Agassiz lasted about 4,300 years and covered an area of about 200,000 square miles in the course of its various stages (Elson 1969:37, 1971:285). Today the area formerly covered by the lake is characterized by the presence of glacio-fluvial and lake features including beach ridges, deltas, relict spillways, and basin deposits of sand, silt, and clay.

The most important topographic feature in relation to FbMi-5 is the Campbell-phase beach ridge which is situated behind the site. Beach ridges such as this were formed by the wave action of the glacial lake on the unconsolidated glacial till overlying the bedrock (Tyrell 1890:405, Upham 1896:3, Elson 1969:75, 1971:285). The Agassiz beach ridges run across the regional slope which descends from the highlands in the west to Lakes Winnipeg and Manitoba in the east. To quote Tyrell's (1890:405) description of the orientation of the beach ridges:

> Beyond the Valley river the ridges continue in a direction 15° west of north for sixty miles, to the northeast angle of the Duck Mountains, when they turn abruptly westward into the valley of the Swan River. Crossing this valley they are well marked on the eastern face of the Porcupine mountains. . . .

The dimensions of the beach ridges are variable. These "slightly rounded" ridges may rise from three to ten to twenty-five feet above the surrounding land surface (Tyrell 1890:405, Upham 1891:246). They vary from 150 to 500 feet in width (Elson 1969:75).

Elson's (1971:285) lithology of the Glacial Lake Agassiz beach pebbles of the western beaches in the eight to sixteen millimeter fraction revealed the distribution indicated in Table 1.

TABLE 1

AGASSIZ BEACH RIDGE LITHOLOGY

Rock Type	Percentage	Range
Limestone and dolomite	70%	45 to 90%
Coarse grained igneous	13%	4 to 30%
Fine grained or aphanitic (metamorphic rock)	13%	3 to 50%
Quartz and quartzite	3%	0 to 7%

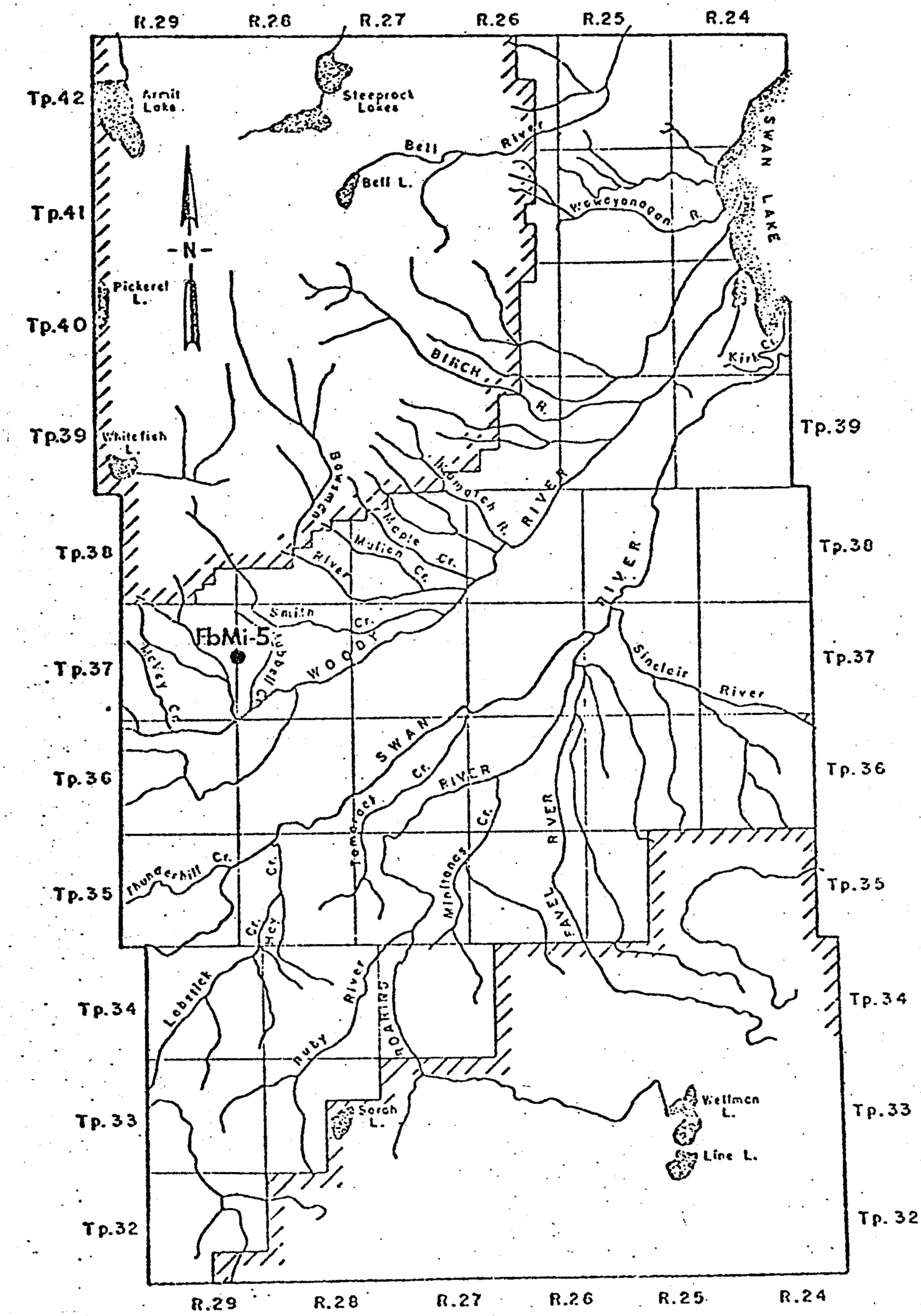
Drainage

The Swan River Valley lies within the Lake Winnipeg-Nelson River drainage basin. Drainage follows the general relief of the valley and runs from the escarpment in the west to the lowlands in the east (Fig. 4). The Swan and Woody Rivers are the two main fluvial channels in the valley, and are supplemented by numerous streams which drain the Duck and Porcupine Mountains. In areas of till deposits, the land is gently sloping, being more level in areas of lacustrine and alluvial deposition (Ehrlich, Pratt, and Leclaire 1962:19). Natural drainage patterns are impeded by the previously described beach ridges which run perpendicular to the slope. One of the results of the damming effect of the beach ridges is the formation of swamp land on the western slope of the beach. "On the western side of these beaches there is generally a strip of shallow peat or muck, and on the eastern side of the beaches there is generally a narrow strip of sand (Ellis 1959:29)." Another effect of the beach ridges is manifested at FbMi-5, namely the supply of sufficient quantities of ground water to adjacent low-lying situations to maintain peat growth.

Soils

A mechanical analysis of a soil column from FbMi-5 classified it as being an Organic Mesisol (Rutter,

DRAINAGE SYSTEM OF THE SWAN RIVER VALLEY



(After:Ehrlich, Pratt and LeClaire)

FIGURE 4

personal communication to Pettipas). These soils are composed of organic deposits and are characteristically saturated for most of the year, certainly true for this site. The depth of the organic soil varies throughout much of the site due to bulldozer activity, and where disturbed is not typical of the shallow peat designation given the area in the regional soils survey classification (Ehrlich, Pratt, and Leclaire 1962:66).

Peat development in the region is initiated when aquatic plants such as pond lilies, swamp grasses, sedges and reeds, convert shallow ponds into organic deposits. According to Ellis (1959:29), "these fen type peats, occupying the lower positions, are also under the influence of ground water." Dr. John Elson (personal communication to Pettipas) visited the site and made the following observations regarding the soil and its formation. The peat is alkaline and is maintained by the upward movement of groundwater from the beach behind the site. Aquatic snail shells present in the base of the peat suggest that conditions were wetter at one time and that a shallow pond existed at the site. Elson's views are substantiated in part by a bryological report which stated that basal peat submitted for radio-carbon dating was of aquatic derivation in the primary stages of production. The basal peat later decomposed under the influence of terrestrial growth and changed into muck.

Present Vegetation of the Swan River Valley

The vegetation of the Swan River area is characteristic of the southern Boreal Forest. There are two major vegetational subdivisions within the Swan River region; the Manitoba Lowlands or Swan River Plain, and the highlands and Kenville Plain.

On the Swan River Plain, aspen (*Populus tremuloides*) and balsam poplar (*P. balsamifera*) may be found in pure stands, or mixed with white spruce (*Picea glauca*) and white birch (*Betula papyrifera*). Jack pine (*Pinus banksiana*) and aspen associations occupy sand and gravel ridges. Peat bogs and poorly drained areas are characterized by black spruce (*Picea mariana*) and tamarack (*Larix laricina*).

Above the escarpment and in the hilly areas of the Duck and Porcupine Mountains, aspen, balsam poplar, white birch, and white spruce are found in varying associations. Once again, jack pine is found on the gravel ridges while black spruce and tamarack occupy the peat deposits and poorly drained areas (Ehrlich, Pratt, and Leclaire 1962:24).

Climate

The Swan River area falls within Köppen's Dfb classification, with temperatures that are higher in the summer and lower in the winter than the world average for the latitude. The area is sub-humid with most of the precipitation occurring during the summer months. The mean annual temperature in Swan River is 31°F, July being the warmest month with an average temperature of 64.1°F and January the coldest at -4.3°F. The average growing season is 160 days. June is the wettest month, averaging 3.11 inches of precipitation, while January is the driest with .63 inches. The summer precipitation ranges from under ten to over twenty inches, with an average of between ten and fifteen inches. The average precipitation from April to October is 13.7 inches, and from November to March there is an average of 4.4 inches of snow. The highlands are more humid than the plain and there is often three to five degrees difference in temperature between the mountains and the plain (Ehrlich, Pratt, and Leclaire 1962:21).

Physical Conditions and Grid Layout of the Site

FbMi-5 is situated in a spruce-tamarack swamp. Directly to the west lies a northeasterly-trending ridge of the Campbell strandline, while a road cuts through the eastern section of the site. Parallel to the road are a ditch, an upward-sloping section of bulldozed peat, and a windrow (Fig. 5). During both field seasons, the bottom of the ditch was filled with water (Plates 1 and 2). Vegetation in the ditch consisted of willow and bullrushes; the sloping strip of peat and windrow were overgrown with willow, while the area west of the windrow was dominated by undisturbed spruce, tamarack, and willow (Pettipas, personal communication).

The datum line for the site was established in the bulldozed area and oriented along a north-south axis, using magnetic north as the point of reference. A datum point for the site was arbitrarily selected on the datum line, and the southwest peg served as datum for the individual excavation units. Adjoining units were separated by twenty-centimeter balks; the only exceptions were 20N0E-20N1W and 20N2W-20N3W. In all, fifty-two two-meter squares were opened. Of these, nine were located within the spruce-tamarack area west of the windrow (Fig. 6, shaded units), one (N16E) was in the ditch, and the rest were in the bulldozed peat and windrow.

CROSS-SECTION OF THE FbMi-5 SITE

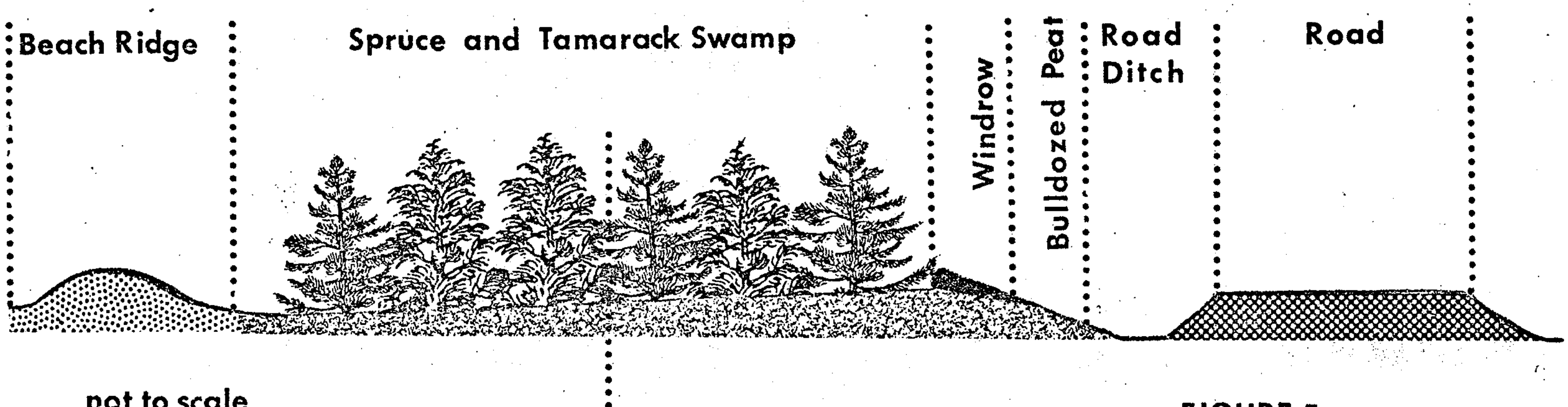


FIGURE 5

GRID LAYOUT AND EXCAVATION SCHEDULE, FbMi-5

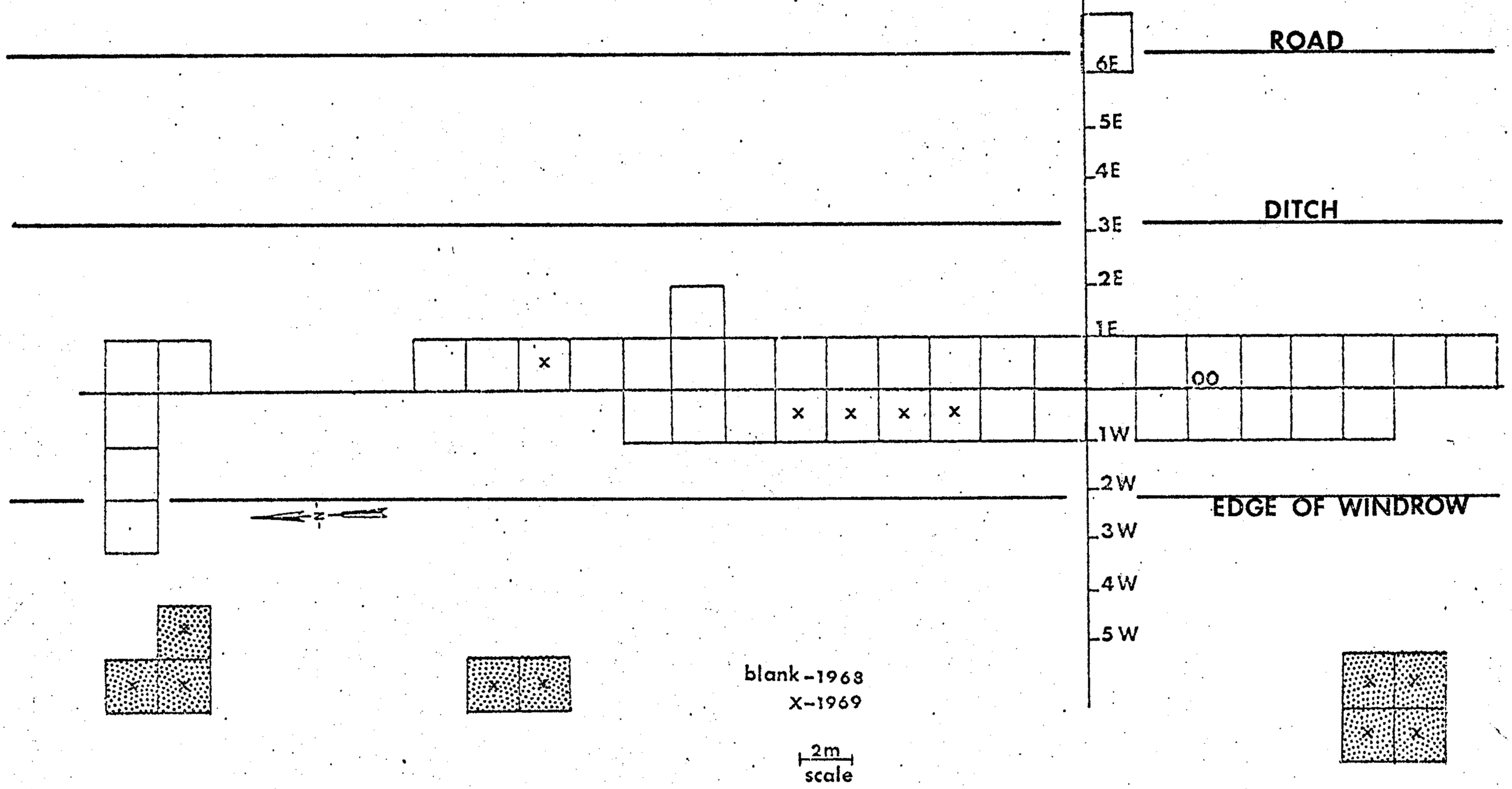


FIGURE 6

Conditions of Excavation

The excavation of the site was hampered by the dense vegetation west of the windrow, the overburden of sterile peat in the bulldozed area and windrow, and the excessive moisture that typifies swampy, depressional areas. Shovels were utilized to remove the sterile peat and trowels were used to excavate the occupation zone. Artifacts were recovered within and below the basal peat and occasionally within the underlying sand and clay. Water seepage became a problem in the lower levels and in some cases impeded the recovery of artifacts from the "soupy" matrix. The presence of flakes at the base of the peat and in the first few centimeters of the mineral substrate indicated that natural disturbance had occurred, with solufluction, tree roots, and, under drier conditions, rodent activity contributing to some vertical redistribution of cultural materials (Pettipas, personal communication). As a consequence, many of the artifacts and waste flakes were found lying at varying angles of repose.

CHAPTER II

THE ARTIFACT SAMPLE

The artifact sample from FbMi-5 consists of material surface collected by Gryba, and that which was excavated in the summers of 1968 and 1969. For the statistical description of the collection, the artifacts were dichotomised on the basis of whether or not they had been excavated. This initial division was made because there remains the possibility that the surface artifacts were not from the same occupation as were those that were excavated. The results of the comparison of the two groups of artifacts may indicate that they came from one population, although sample limitations must be kept in mind.

A cursory report on the surface finds was published after the initial discovery of the site (Gryba 1968). This report included photographs and selected measurements of the projectile points and point fragments, the range of biface lengths, and a brief description of the scrapers and drawings of same. In the present writer's opinion the artifacts were not adequately described, nor were sufficient data presented to make comparisons with the excavated material possible. Accordingly, a further description of the artifacts has been made in order that a comparison of the two groups of artifacts may be made.

Limitations Imposed by the Sample

Any attempted analysis of the artifacts recovered at the site must of necessity operate under certain inherent limitations. First, and most importantly, the artifacts cannot be considered to be representative of the site *in toto* as they probably do not comprise a random sample (a random sample being one in which each member of the parent population has an equal probability of being chosen for the sample). The collection of the artifacts in question was not random in that the perimeter of the site was not determined, and those areas of the site that could be excavated were limited by the road and ditch running through the site, the windrow transecting the site, and the generally boggy nature of the soil coupled with the forest cover. The artifact sample would accordingly be classified as a grab sample, and as such cannot be considered truly representative of the site or of the population of artifacts from which it has been derived.

An additional limitation is that of size, that is, the sample size of any one artifact class is small and hence imposes further restrictions on what conclusions can be drawn from any statistical analysis of the material. Accordingly, the most appropriate use of statistics for this sample would be for descriptive purposes only, in that any typology based on the sample might not be representative of the original artifact population of the site.

The flake technology represented by the lithic debitage from FbMi-5 has not been analysed. There are two reasons for this omission: 1) the expertise required for such an examination; 2) the lack of agreement on the utility of such an analysis (Mewhinney 1964, Schneider 1972). It has been found that a variety of manufacturing techniques may produce similar flake forms which makes the association of flake morphology and specific flaking techniques problematical (Schneider 1972:92). The present writer is not familiar with refinements in lithic technology and would therefore hesitate to undertake such an analysis.

The surface and excavated samples are not entirely comparable, and it should be noted that no quartzite, granite, or basaltic artifacts were included in the surface finds.

The Variables

It is generally recognized that the range of variables or attributes within a given artifact grouping is constrained by templates or precepts in the maker's mind. At the same time, variation is inevitable due to differences in the quality of the raw material employed, motor ability of the maker, and so on.

At FbMi-5 the artifact sample itself imposes many limitations on the variables utilized as many of the tools were incomplete or fragmentary. Continuous variables such as length, width, thickness, and weight cannot be obtained for the incomplete artifacts, nor can discrete variables such as shape or basal treatment be discerned.

The variables employed are discussed at the beginning of each artifact class. Tables are provided to indicate absolute dimensions.

Terminology

The following section is included to provide definitions for the terminology used throughout this paper in the hope that it will prevent ambiguity in the interpretation of the data presented. Both the flake and the retouch definitions are patterned after those presented by White (1963).

Decortication Flakes

Decortication flakes are struck from a naturally occurring irregularity of a nodule or pebble and are usually detached transversely from one of the narrow ends (White et al., 1963:5). Decortication flakes may be divided into two types:

1) Primary Decortication Flakes

These flakes are characterized by the presence of cortex on the entire outer surface of the flake. These flakes were usually discarded (White 1963:5).

2) Secondary Decortication Flakes

Cortex is only present on a portion of the outer surface. These flakes were retouched to produce a tool with a natural backing and did not require hafting or further modification to protect the hand of the person using the artifact.

Flake Shape

The basis for the description of flake shape is the orientation of the lateral edges to the longitudinal axis using the proximal or bulbar end of the flake as the major point of reference. The basic outlines of the flake tools will be designated as follows:

1) Expanding

   For this type of flake the lateral edges diverge towards the distal portion of the flake, that is, the width of the flake is greatest at the distal end.

2) Converging

   The lateral edges converge towards the distal end of the flake giving it a triangular outline.

3) Parallel Sided

   This type of flake is characterized by lateral edges that are roughly parallel to each other with no major divergence or convergence. Often there is a central ridge running down the dorsal surface of the flake.

4) Amorphous

   This term will be used to designate those flakes which have an irregular outline which precludes their inclusion in any of the previous categories, or which are too fragmentary to be assigned an overall shape.

Retouch

The term "retouch" will be used to designate deliberate subtractive modifications made on flakes or utilized portions of lithic material excluding utilized flakes. The so-called "use" retouch is not included within the context of this paper because of the inherent difficulty in identifying the different degrees of usage.

1) Marginal Retouch

   Marginal retouch will refer to any trimming that is restricted to the edges of the artifact, whether unifacial or bifacial (White 1963:9).

2) Invasive Retouch

   This type of retouch may be unifacial or bifacial and covers the dorsal and/or ventral surface of the artifact.

3) Bifacial Retouch

   Bifacial retouch will be used to refer to retouching that is present on both surfaces of the artifact (White 1963:9).

Unifaces

The term uniface will be used to designate artifacts exhibiting retouch on one surface only, either the ventral or dorsal. The ventral surface is characterized by the presence of a bulb of percussion, and the dorsal being the opposite surface. Unifaces will be categorized according to the orientation of their working edge.

1) Transverse

   The working edge is located at the distal end of the flake at right angles to the longitudinal axis. Artifacts of this type will be referred to as "end scrapers."

2) Lateral

   This type of uniface has its working edge along the lateral margin of the flake, usually parallel to the longitudinal axis of the flake. These artifacts will be termed "side scrapers" for want of a better term.

Bifaces

This artifact category includes those tools that exhibit marginal retouching on both the ventral and dorsal surfaces. The bifacial retouch may be limited to one or more of the lateral edges or may be invasive whereby the entire surface area of the artifact is modified. The biface category has been subdivided as follows:

1) Projectile Points

Projectile points are distinguished from the other two biface categories by their relatively finer invasive bifacial retouching and their symmetry. They are basically triangular in outline and have basal, corner, or side notching. It is assumed that these artifacts functioned primarily as projectile points while it is recognized that they may have performed other functions as well (Ahler 1971, Evans 1957, Frison 1968, and Wilmsen 1968).

2) Knives

The term "knife" will be used to designate bifacially retouched artifacts with finer retouching restricted to the margin of the working edge.

3) Choppers

These artifacts are crudely bifacially retouched and lack the finer marginal retouch found on projectile points and knives. Often choppers exhibit crushing or heavy use wear along their working edges.

Cores

Cores are the parent nodules or cobbles from which flakes have been removed for the manufacture of tools. At FbMi-5 the cores appear to be unprepared, that is, there is no systematic shaping of the lateral edges, only the preparation of a rudimentary striking platform.

General Measurements

Artifact measurements for continuous variables were determined as follows:

1) Maximum Length

   This measurement was taken at the two most distant points on the longitudinal axis.

2) Maximum Width

   The maximum width was taken at the two most distant points on the axis perpendicular to the longitudinal axis.

3) Length of Working Edge

   This measurement was taken in order to include that length of the artifact that had been marginally retouched to function as a tool (i.e. the chord measurement and not the continuous edge).

4) Height of Working Edge

This measurement included the distance from the ventral base to the highest portion of the marginal retouch on the working edge. The end scraper category was measured for this variable.

5) Maximum thickness

The maximum thickness was taken at the point on the artifact where the ventral and dorsal surfaces were most distant from one another.

6) Angle of Working Edge

The ventral transverse edge of the end scraper was positioned along a straight line so that the angle of the working edge fell along lines of the designated angles of a protractor.

Discussion of the Artifacts by Class

Projectile Points

A total of twenty-one projectile points and fragments was recovered at the site. Of the eleven which were surface finds, five may be considered complete. The sample of ten excavated points consisted of only three whole specimens. In this artifact class the following continuous variables were examined:

1) the length of complete points
2) maximum width
3) maximum thickness
4) base width
5) width of neck between notches (where applicable)
6) notch depth
7) notch width

The following four discrete variables were noted:

1) the position of the notching
2) shape of the base
3) presence or absence of basal grinding
4) shape of lateral edge of base below notch

The incomplete nature of the majority of the projectile points recovered at the site precluded the use of additional continuous and discrete variables. Tables 2 to 5 summarize the data and Tables 6 to 9 list the variables for the individual points. Plates 11 and 12 illustrate the points found at the site. Figure 7 shows the distribution of the projectile points and fragments at the site.

Bifaces

The biface category includes those artifacts that have been bifacially retouched. The artifacts included

TABLE 2

EXCAVATED PROJECTILE POINTS: SUMMARY
OF CONTINUOUS VARIABLES

Variable	Sample Size	Range	Mean	Median
Length	4	34.0mm.	39.12mm.	34.7mm.
Width	6	13.7mm.	20.25mm.	20.7mm.
Thickness	7	3.2mm.	5.78mm.	6.2mm.
Base Width	6	8.6mm.	19.50mm.	21.8mm.
Notch Width	7	3.5mm.	6.42mm.	6.0mm.
Notch Depth	7	2.0mm.	2.57mm.	2.5mm.
Neck Width	9	9.0mm.	15.37mm.	16.0mm.

TABLE 3

EXCAVATED PROJECTILE POINTS: SUMMARY OF DISCRETE VARIABLES

Variable		Sample Size	Percentage	Actual Number
Notching	side	10	80%	8
	corner	10	10%	1
	basal	10	10%	1
Base	concave	10	50%	5
	straight	10	50%	5
Basal edges	rounded	8	50%	4
	square	8	50%	4
Basal grinding	present	8	75%	6
	absent	8	75%	2

TABLE 4

SURFACE PROJECTILE POINTS: SUMMARY OF CONTINUOUS VARIABLES

Variable	Sample Size	Range	Mean	Median
Length	5	14.7mm.	36.66mm.	37.5mm.
Width	7	13.0mm.	22.57mm.	20.0mm.
Thickness	9	14.5mm.	7.22mm.	5.5mm.
Base Width	8	19.2mm.	20.35mm.	19.75mm.
Notch Width	6	5.0mm.	6.83mm.	6.5mm.
Notch Depth	8	4.0mm.	2.81mm.	2.0mm.
Neck Width	5	10.0mm.	14.60mm.	14.0mm.

TABLE 5

SURFACE PROJECTILE POINTS: SUMMARY OF DISCRETE VARIABLES

Variable		Sample Size	Percentage	Actual Number
Notching	side	11	63.6%	7
	corner	11	18.18%	2
	basal	11	18.18%	2
Base	concave	11	27.28%	3
	straight	11	63.63%	7
	convex	11	9.09%	1
Basal edges	rounded	8	37.50%	3
	square	8	62.50%	5
Basal grinding	present	10	30.00%	3
	absent	10	70.00%	7

TABLE 6

EXCAVATED PROJECTILE POINTS:

CONTINUOUS VARIABLES

Catalogue Number	Length	Width	Point Thickness	Base Width	Notch		Neck Width
					Width	Depth	
21	N/A*	N/A	N/A	21.6mm.	6.0mm.	4.0mm.	17.0mm.
50	N/A	N/A	N/A	22.0mm.	6.0mm.	2.0mm.	17.0mm.
70	39.5mm.	23.0mm.	6.3mm.	N/A	5.5mm.	2.0mm.	19.0mm.
207	N/A	N/A	4.7mm.	N/A	N/A	N/A	N/A
259	N/A	22.5mm.	6.2mm.	N/A	5.5mm.	2.0mm.	16.0mm.
262	N/A	N/A	N/A	23.0mm.	N/A	N/A	16.0mm.
324	60.5mm.	27.6mm.	7.0mm.	22.5mm.	N/A	N/A	18.4mm.
371	30.0mm.	15.5mm.	6.0mm.	14.0mm.	9.0mm.	2.5mm.	11.0mm.
372	N/A	19.0mm.	6.5mm.	N/A	7.0mm.	2.5mm.	14.0mm.
443	26.5mm.	13.9mm.	3.8mm.	13.9mm.	6.0mm.	3.0mm.	10.0mm.

*N/A designates those measurements that could not be taken because of the fragmentary nature of the projectile points.

TABLE 7

EXCAVATED PROJECTILE POINTS:

DISCRETE VARIABLES

Catalogue Number	Position of Notching	Shape of Base	Shape of Basal Edges	Basal Grinding
21	side	concave	square	present
50	side	concave	square	present
70	side	concave	N/A	N/A
207	basal	concave	N/A	N/A
259	side	straight	square	present
262	side	concave	round	present
324	corner	straight	rounded	present
371	side	straight	rounded	present
372	side	straight	square	absent
443	side	concave	rounded	absent

TABLE 8

SURFACE PROJECTILE POINTS:

CONTINUOUS VARIABLES

Catalogue Number	Length	Point Width	Thickness	Base Width	Notch Width	Notch Depth	Neck Width
S-1	N/A	N/A	5.5mm.	19.2mm.	5.0mm.	3.0mm.	12.5mm.
S-2	29.8mm.	20.0mm.	5.5mm.	20.0mm.	6.0mm.	2.5mm.	14.5mm.
S-3	32.0mm.	19.5mm.	5.5mm.	19.5mm.	7.0mm.	3.0mm.	14.0mm.
S-4	37.5mm.	19.5mm.	5.0mm.	N/A	N/A	N/A	N/A
S-5	N/A	32.5mm.	19.5mm.	31.7mm.	10.0mm.	6.0mm.	21.0mm.
S-8	39.5mm.	20.0mm.	5.5mm.	12.5mm.	N/A	N/A	N/A
S-9	44.5mm.	23.5mm.	7.5mm.	20.4mm.	N/A	N/A	N/A
S-10	N/A	23.0mm.	5.0mm.	21.0mm.	N/A	N/A	N/A
S-11	N/A	N/A	N/A	N/A	8.0mm.	2.0mm.	N/A
S-12	N/A	N/A	N/A	N/A	N/A	N/A	N/A
S-13	N/A	N/A	6.0mm.	N/A	5.0mm.	2.0mm.	11.0mm.

TABLE 9

SURFACE PROJECTILE POINTS:

DISCRETE VARIABLES

Catalogue Number	Position of Notching	Shape of Base	Shape of Basal Edges	Basal Grinding
S-1	side	straight	square	present
S-2	side	straight	square	present
S-3	side	straight	square	present
S-4	side	straight	N/A	N/A
S-5	side	straight	rounded	absent
S-8	corner	convex	N/A	present
S-9	base	concave	rounded	absent
S-10	base	concave	rounded	present
S-11	side	concave	square	present
S-12	corner	straight	N/A	present
S-13	side	straight	square	absent

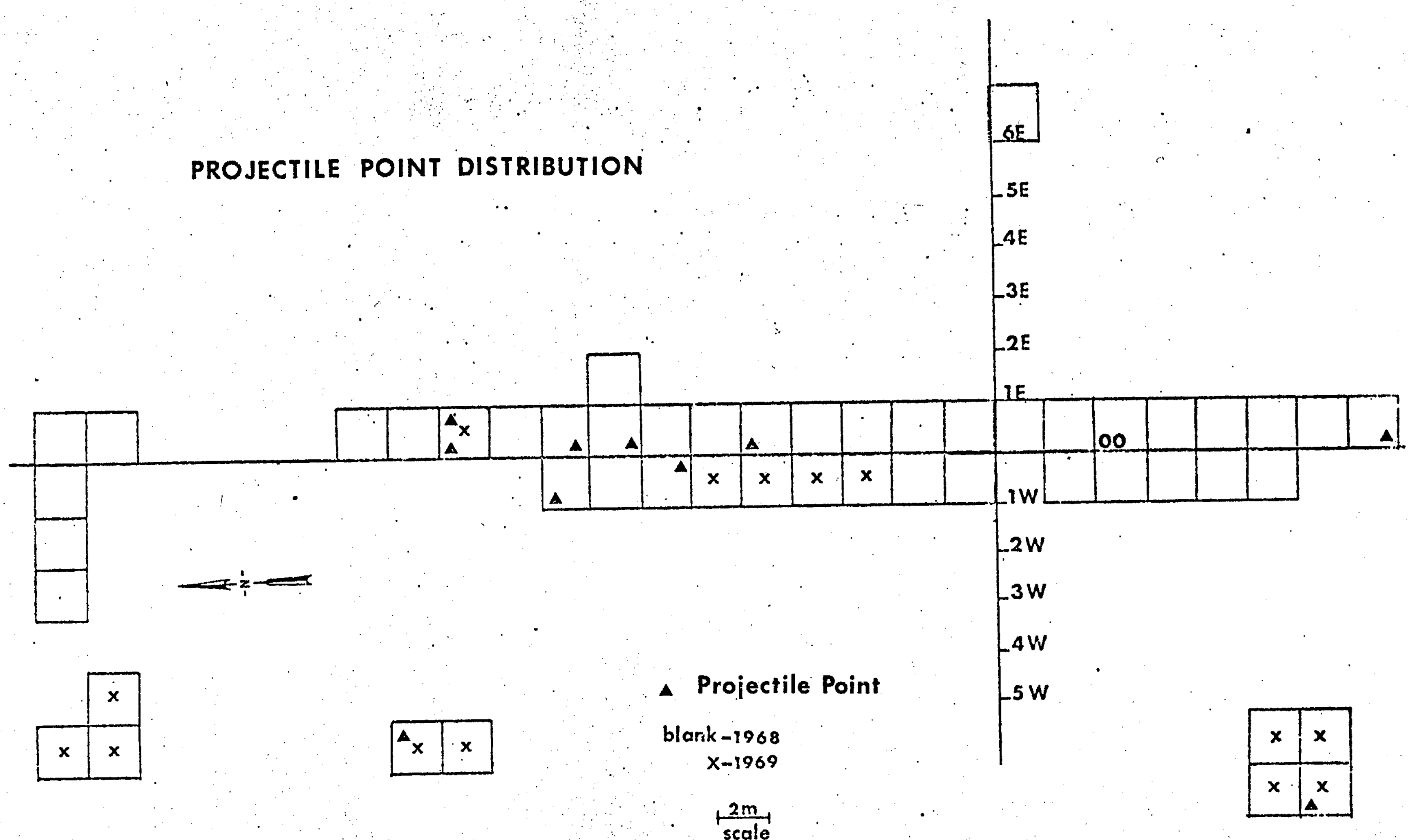

PROJECTILE POINT DISTRIBUTION
6E
5E
4E
3E
2E
1E
00
1W
2W
3W
4W
5W
N
Projectile Point
blank-1968
X-1969
2m
scale

FIGURE 7

here most likely functioned as knives or general purpose cutting tools. Only the complete knives, six of which were found on the surface and thirteen of which were excavated, were examined.

The following continuous variables were noted:

1) length of the knife;

2) maximum width of the knife;

3) maximum thickness of the knife.

In addition, the following discrete variables were examined for:

1) raw material used;

2) the presence or absence of cortex;

3) the general shape or outline of the knife.

The variables for this group of artifacts are presented in Tables 14 and 15, and a summary of same in Tables 10 to 13. A representative sample of the artifacts is shown in Plates 15 and 16. The distribution of bifaces at the site is illustrated in Fig. 8.

<u>End Scrapers</u>

There was a total of thirty-seven end scrapers found at the site, twenty-four of which were excavated (Plates 13 and 14).

In this artifact class, the following continuous

BIFACE DISTRIBUTION

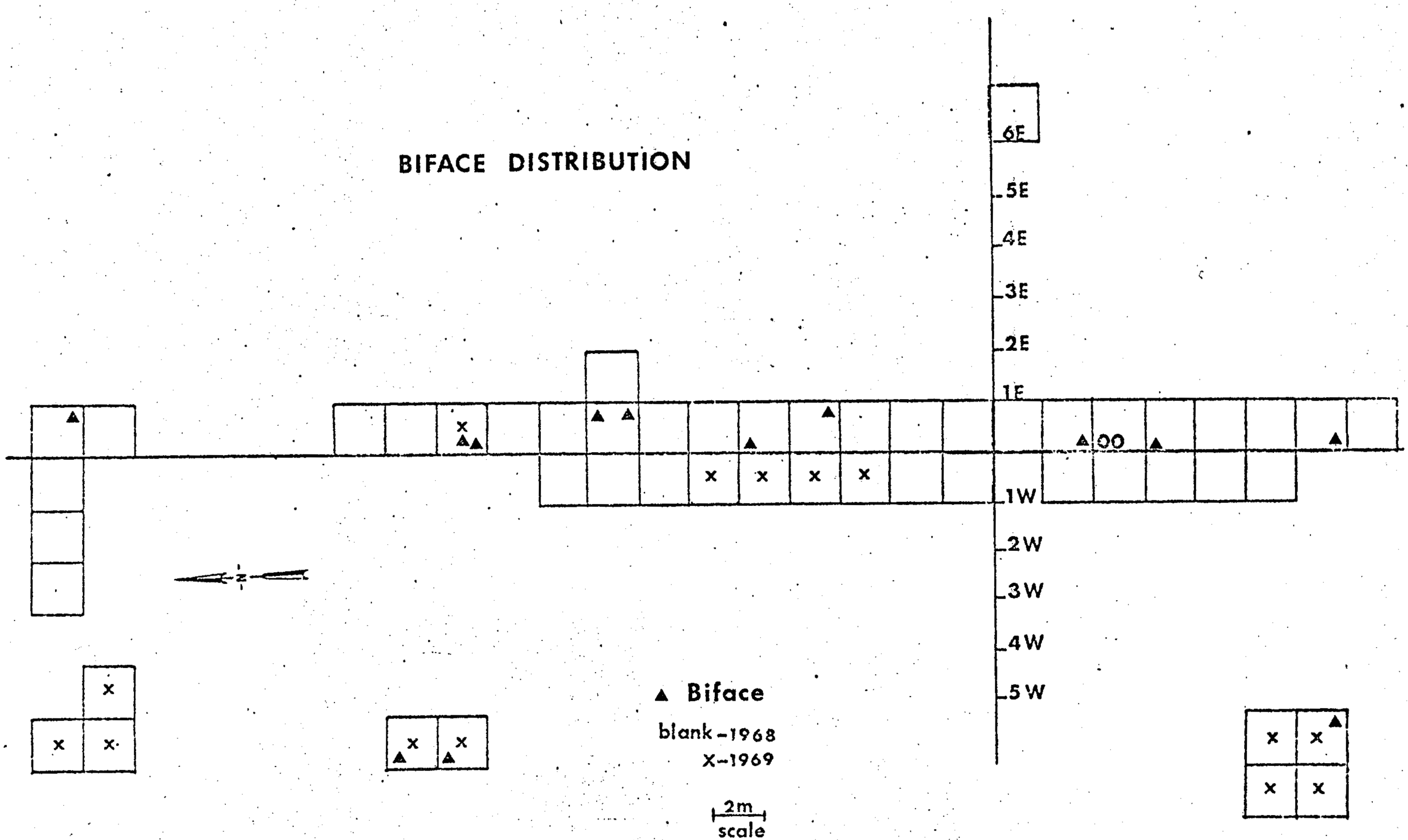


FIGURE 8

TABLE 10

SURFACE BIFACES: SUMMARY
OF CONTINUOUS VARIABLES

Variable	Sample Size	Range	Mean	Median
Length	6	81.0mm.	63.3mm.	53.0mm.
Width	6	37.0mm.	41.08mm.	35.25mm.
Thickness	6	14.5mm.	12.75mm.	10.5mm.

TABLE 11

SURFACE BIFACES: SUMMARY
OF DISCRETE VARIABLES

Variable		Sample Size	Percentage	Actual Number
Material	chert	6	100%	6
Cortex	present	6	16.7%	1
	absent	6	83.3%	5
Shape	ovate	6	50.0%	3
	larmate	6	33.3%	2
	round	6	16.7%	1

TABLE 12

EXCAVATED BIFACES: SUMMARY
OF CONTINUOUS VARIABLES

Variable	Sample Size	Range	Mean	Median
Length	13	81.0mm.	70.61mm.	63.0mm.
Width	13	69.0mm.	45.11mm.	45.0mm.
Thickness	13	21.0mm.	23.81mm.	17.0mm.

TABLE 13

EXCAVATED BIFACES: SUMMARY
OF DISCRETE VARIABLES

Variable		Sample Size	Percentage	Actual Number
Material	chert	13	84.62%	11
	quartzite	13	15.38%	2
Cortex	present	13	76.92%	10
	absent	13	23.07%	3
Shape	ovate	13	61.53%	8
	larmate	13	30.77%	4
	amorphous	13	7.69%	1

TABLE 14

SURFACE BIFACES: LIST OF VARIABLES

Catalogue Number	Length	Width	Thickness	Material	Cortex	Shape
S-1	117.0mm.	62.0mm.	17.0mm.	chert	absent	ovate
S-2	70.0mm.	55.0mm.	22.0mm.	chert	absent	amorphous
S-3	51.0mm.	34.0mm.	9.0mm.	chert	absent	ovate
S-12	47.0mm.	34.5mm.	10.5mm.	chert	absent	ovate
S-20	36.0mm.	25.0mm.	7.5mm.	chert	present	larmate
S-21	59.0mm.	36.0mm.	10.5mm.	chert	absent	larmate

Table 15

EXCAVATED BIFACES: LIST OF VARIABLES

Catalogue Number	Length	Width	Thickness	Material	Cortex	Shape
8	72.0mm.	47.0mm.	17.0mm.	chert	present	ovate
53	63.0mm.	46.0mm.	22.0mm.	chert	present	amorphous
75	37.0mm.	25.0mm.	9.5mm.	chert	present	larmate
94	108.0mm.	61.5mm.	20.5mm.	quartzite	present	ovate
155	56.0mm.	30.0mm.	13.5mm.	chert	present	larmate
161	54.0mm.	35.0mm.	12.5mm.	chert	present	ovate
210	78.0mm.	62.0mm.	14.5mm.	quartzite	present	ovate
236*	38.5mm.	15.0mm.	5.0mm.	chert	present	larmate
315	54.0mm.	41.0mm.	17.5mm.	chert	present	ovate
369	106.5mm.	45.0mm.	17.5mm.	chert	absent	larmate
370	78.0mm.	54.0mm.	16.0mm.	chert	absent	ovate
412	118.0mm.	84.0mm.	26.0mm.	chert	absent	ovate
423	55.0mm.	41.0mm.	18.0mm.	chert	present	ovate

*hafted knife

variables were examined:

1) width of working edge;

2) height of working edge;

3) angle of working edge;

4) length of entire artifact.

Additionally, four discrete variables were noted:

1) raw material;

2) general outline of scraper;

3) presence of lateral retouch;

4) outline of transverse cross-section.

The scrapers were classed as being either chert or chalcedony according to the definitions of the raw materials as presented. Most of the end scrapers are triangular in outline, and those that were of the "snub-nosed" variety were included in this category. Some of the scrapers were not regular in shape, that is they were worked only along the distal end of the flake, and were termed irregular. Most of the end scrapers exhibited some degree of lateral retouch along at least one side, while the others did not, and these were classified accordingly. The scrapers were then examined to determine their outline in transverse cross-section. Four transverse outlines could be distinguished: triangular, concave, convex, and flat. These outlines are self-explanatory, except that the convex differed from the triangular in its rounded as opposed to ridged dorsal peak.

Tables 16 and 17 summarize the variables for the excavated end scrapers, and Tables 20 and 21 the data for each scraper. Tables 18 and 19 give the distribution of the same variables for the surface finds, and Tables 22 and 23 the raw data for this group of artifacts.

The end scrapers are included with the side scrapers for purposes of plotting a distribution map (Fig. 9) because both types of artifacts could have been used for similar purposes.

Side Scrapers

A sample of sixty-five complete side scrapers was recovered at the site. Forty-two were excavated and the remaining twenty-three were surface finds. Of all the scrapers found, only two were made of chalcedony (both incomplete), the remainder being manufactured from chert.

For this artifact class the following continuous variables were examined:

1) lenth of working edge;

2) width of flake;

3) thickness of flake

The following discrete variables were noted:

TABLE 16

EXCAVATED END SCRAPERS: SUMMARY
OF CONTINUOUS VARIABLES

Variable	Sample Size	Range	Mean	Median
Width of working edge	24	10.0mm.	17.95mm.	17.4mm.
Height of working edge	24	8.9mm.	4.74mm.	4.5mm.
Angle of working edge	24	30°	56.87°	55°
Length of artifact	16	22.8mm.	26.53mm.	25.5mm.

TABLE 17

EXCAVATED END SCRAPERS: SUMMARY
OF DISCRETE VARIABLES

Variable		Sample Size	Percentage	Actual Number
Raw material	chert	24	91.66	22
	chalcedony	24	8.34	2
Outline of scraper	triangular	24	62.50	15
	irregular	24	37.59	9
Lateral retouch	present	24	70.83	17
	absent	24	29.16	7
Cross-section	triangular	24	41.66	10
	concave	24	4.16	1
	convex	24	37.51	9
	flat	24	16.66	4

TABLE 18

SURFACE END SCRAPERS: SUMMARY OF CONTINUOUS VARIABLES

Variable	Sample Size	Range	Mean	Median
Width of working edge	13	20.6mm.	23.29mm.	20.8mm.
Height of working edge	13	8.0mm.	6.24mm.	6.0mm.
Angle of working edge	13	25°	58.84°	60°
Length of artifact	13	33.0mm.	29.60mm.	28.0mm.

TABLE 19

SURFACE END SCRAPERS: SUMMARY
OF DISCRETE VARIABLES

Variable		Sample Size	Percentage	Actual Number
Raw material	chert	13	84.62	11
	chalcedony	13	15.38	2
Outline of scraper	triangular	13	84.62	11
	irregular	13	15.38	2
Lateral retouch	present	13	69.23	9
	absent	13	30.76	4
Cross-section	triangular	13	53.84	7
	concave	13	7.69	1
	convex	13	15.38	2
	flat	13	23.07	3

TABLE 20

EXCAVATED END SCRAPERS: CONTINUOUS VARIABLES

Catalogue Number	Length	Width	Height	Angle	Material
6	38.6	15.3	1.5	45	chert
29	18.3	14.5	3.5	55	chert
55	32.5	24.0	3.0	50	chalcedony
56	N/A	15.5	4.5	60	chert
62	25.6	22.5	5.5	50	chert
180	27.7	12.4	3.0	45	chert
233	24.0	20.5	10.4	75	chert
245	27.2	19.0	7.0	50	chert
292	N/A	17.0	5.3	70	chert
293	N/A	18.5	4.8	45	chert
294	21.0	11.0	3.4	65	chert

(cont'd)

Table 20 (cont'd)

Catalogue Number	Length	Width	Height	Angle	Material
295	N/A	22.5	3.0	50	chert
318	15.8	15.0	3.0	45	chert
356	22.0	16.5	5.5	50	chert
357	34.3	16.2	3.8	55	chert
365	37.7	20.5	7.5	75	chert
366	18.5	17.4	4.5	50	chert
368	N/A	22.0	2.7	45	chert
378	N/A	23.5	5.0	65	chert
410	25.4	16.0	3.5	60	chert
431	N/A	17.5	3.5	65	chalcedony
432	23.2	23.0	8.8	65	chert
446	N/A	10.0	4.3	70	chert
459	32.7	20.5	6.8	60	chert

TABLE 21

EXCAVATED END SCRAPERS: DISCRETE VARIABLES

Catalogue Number	Outline	Lateral Retouch	Transverse Cross-section
6	irregular	absent	flat
29	irregular	absent	convex
55	irregular	present	convex
56	triangular	present	triangular
62	irregular	absent	concave
180	irregular	absent	convex
233	snub	present	triangular
245	triangular	present	convex
292	triangular	present	convex
293	irregular	present	convex
294	triangular	absent	triangular
295	irregular	present	flat
318	triangular	absent	triangular

(cont'd)

Table 21 (cont'd)

Catalogue Number	Outline	Lateral Retouch	Transverse Cross-section
256	irregular	present	triangular
357	triangular	present	convex
365	triangular	present	triangular
366	triangular	present	convex
368	triangular	present	triangular
378	triangular	present	flat
410	triangular	present	triangular
431	irregular	absent	triangular
432	snub	present	convex
446	triangular	present	flat
459	triangular	present	triangular

TABLE 22

SURFACE END SCRAPERS:
CONTINUOUS VARIABLES

Catalogue Number	Length	Width***	Height*	Angle**	Material
S-1	28.0	18.5	5.0	70	chert
S-2	21.5	27.4	4.0	55	chert
S-3	23.5	26.5	3.5	45	chalcedony
S-4	26.5	19.7	5.0	60	chalcedony
S-5	23.5	19.5	6.0	65	chert
S-6	18.0	19.0	5.0	70	chert
S-7	26.0	17.4	7.5	55	chert
S-8	29.0	20.8	10.0	70	chert
S-9	28.5	24.0	6.0	70	chert
S-11	36.5	22.5	5.7	45	chert
S-12	N/A	19.5	6.0	60	chert
S-13	44.0	30.0	6.0	45	chert
S-14	51.0	38.0	11.5	55	chert

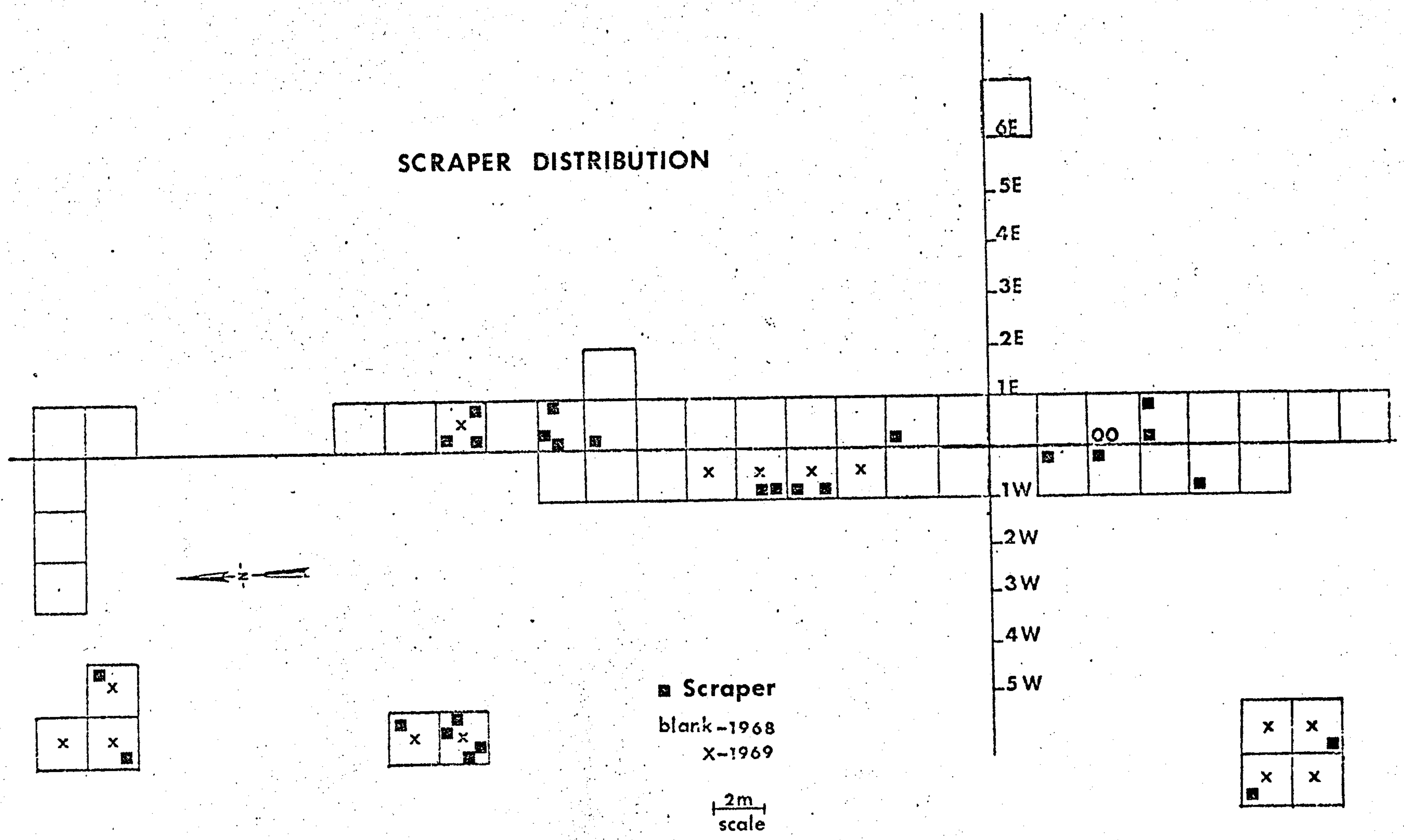
*this measurement is the maximum height of the working edge in millimeters
**this is the angle of the working edge in degrees
***this is the width of the working edge in millimeters

TABLE 23

SURFACE END SCRAPERS:
DISCRETE VARIABLES

Catalogue Number		Lateral Retouch	Transverse Cross-section
S-1	triangular	present	plano-convex
S-2	triangular	present	triangular
S-3	triangular	present	triangular
S-4	triangular	present	flat
S-5	triangular	present	concave
S-6	tear drop	absent	triangular
S-7	irregular	absent	triangular
S-8	triangular	present	triangular
S-9	triangular	absent	triangular
S-11	triangular	present	flat
S-12	triangular	present	flat
S-12	irregular	absent	triangular
S-13	triangular	present	convex
S-14	triangular	present	flat

62



SCRAPER DISTRIBUTION
6E
5E
4E
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00
1W
2W
3W
4W
5W
N
Scraper
blank-1968
X-1969
2m
scale

FIGURE 9

1) shape of the working edge;

2) number of working edges

3) shape of the flake

4) presence or absence of cortex.

The variables for the excavated portion of the sample are summarized in Tables 24 and 25, and for the surface collection in Tables 26 and 27. Plate 19 shows an assortment of these artifacts.

Hammerstones

A total of eight probable hammerstones was excavated at FbMi-5. Six were granite cobbles while the other two were basalt. All of the hammerstones are rounded and would appear to have been waterworn. The amount of wear on the hammerstones varies from slight with only localized crushing, to heavy wear with gouges out of the cobble.

The average length of the hammerstones is 96.32mm., the average width 69.37mm., the average thickness 42.11mm., and an average weight of 496.86 grams. These mean measurements are deceptive because of the small sample size and the range of variation within the artifact class. Table 28 gives the individual measurements of the hammerstones.

Six of the cobbles are oval and the other two are

TABLE 24

EXCAVATED SIDE SCRAPERS: SUMMARY OF
CONTINUOUS VARIABLES

Variable	Sample Size	Range	Mean	Median
Length	42	54.0mm.	41.15mm.	39.75mm.
Width	42	41.0mm.	29.28mm.	27.75mm.
Thickness	42	17.5mm.	9.85mm.	7.50mm.

TABLE 25

EXCAVATED SIDE SCRAPERS: SUMMARY OF DISCRETE VARIABLES

Variable		Sample Size	Percentage	Actual Number
Shape of working edge	straight	42	33.33%	14
	convex	42	54.76%	23
	concave	42	21.42%	9
Number of working edges	one	42	80.95%	34
	two	42	19.04%	8
Flake shape	expanding	42	33.33%	14
	converging	42	2.38%	1
	parallel	42	33.33%	14
	amorphous	42	30.96%	13
Cortex	present	42	30.96%	13
	absent	42	69.04%	29

TABLE 26

SURFACE SIDE SCRAPERS: SUMMARY OF CONTINUOUS VARIABLES

Variable	Sample Size	Range	Mean	Median
Length	23	43.0mm.	41.13mm.	38.0mm.
Width	23	42.0mm.	27.52mm.	25.0mm.
Thickness	23	20.5mm.	8.13mm.	7.0mm.

TABLE 27

SURFACE SIDE SCRAPERS: SUMMARY OF DISCRETE VARIABLES

Variable		Sample Size	Percentage	Actual Number
Shape of working edge	straight	23	39.13%	9
	convex	23	52.17%	12
	concave	23	8.69%	2
Number of working edges	one	23	95.65%	22
	two	23	4.34%	1
Flake shape	expanding	23	39.13%	9
	converging	23	4.34%	1
	parallel	23	30.43%	7
	amorphous	23	26.08%	6
Cortex	present	23	34.78%	8
	absent	23	65.21%	15

TABLE 28

HAMMERSTONES: EXCAVATED
LIST OF VARIABLES

Catalogue Number	Length	Width	Thickness	Weight*	Material	Shape
181	105.00mm.	86.5mm.	51.0mm	715.5	granite	flat
220	83.30mm.	73.5mm.	38.4mm.	348.4	granite	flat
225	121.50mm.	88.0mm.	55.0mm.	877.0	basalt	oval
234	122.50mm.	79.0mm.	40.5mm.	608.8	granite	oval
325	118.00mm.	84.0mm.	45.5mm.	739.0	granite	oval
353	42.00mm.	32.5mm.	27.5mm.	55.0	granite	oval
358	107.80mm.	68.5mm.	55.0mm.	619.0	granite	oval
392	70.00mm.	43.0mm.	24.0mm.	12.3	basalt	oval

*weight is given in grams

round and flat. The exact functions of these hammerstones is not known, but they could well have been used to smash the bone at the site, for the production of vegetable or animal foods, or for the production of tools.

Figure 10 shows the distribution of the hammerstones at the site, most of which seem clustered in 5N1W. Several rocks and cores were found in this unit which may indicate that stone working was carried out there.

Miscellaneous

Plate 20 pictures what appears to be the midsection of a Paleo-Indian point. Along one of the lateral edges there is a burin-like facet caused by the removal of a portion of the blade. The problem here is to decide whether or not a burin was intentionally struck from the blade. One study (Epstein 1963) has concluded that when a spear or dart hits a relatively hard object the impact can remove one or more burin spalls along one or both sides of the point. Ahler (1971:120) in his experimental testing of projectile point use wear found that "a variety of burin-like fractures are easily produced by accident. . . ."

Epstein (1963:191) states that in Texas the frequency of Paleo-Indian projectile points with burin spalls is higher than for the Archaic period. This difference is attributed to the persistence of the Paleo-Indian practice

HAMMERSTONE DISTRIBUTION

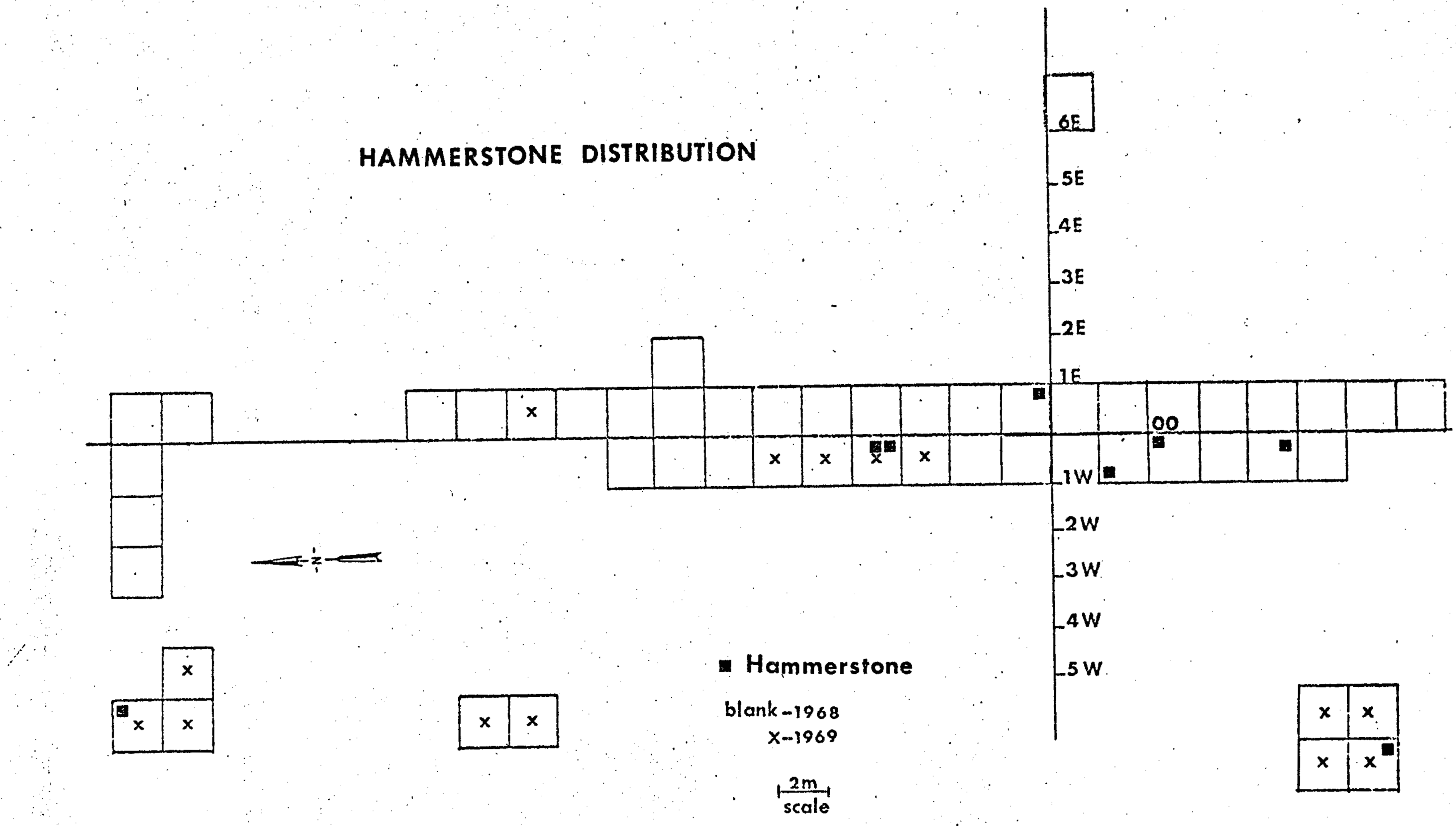

FIGURE 10

of striking off burins into the Archaic period. The occurrence of burin-faceted projectile points is not fully understood, but they have been found in Mexico, Texas, New Mexico, Arizona, Colorado, Nebraska, Alabama, Michigan, Alaska, and the Northwest Territories.

As the specimen in question was part of the surface collection made by Gryba, and no other instances of burin-faceted points or burins were found at the site, it may be assumed that this midsection was picked up and taken to the site prehistorically, perhaps to be used as a knife or to be reworked. The sampling problem, however, must be borne in mind here. The specimen may alternatively represent a persistent Paleo-Indian form.

Raw Materials

In choosing lithic materials for the manufacture of artifacts, prehistoric peoples sought at least three basic qualities: hardness, low tenacity, and homogeneity (Bordaz 1959:9). Hardness is a quality found in siliceous rocks and minerals such as chalcedony, chert, and quartzite, and is valued because it enables an artifact to hold its edge. Low tenacity simply refers to rocks that are not very difficult to fracture. Homogeneity is important as the lack of cleavage planes enables the worker to break the stone along ". . . planes of fracture whose position can be more or less theoretically determined by manipulative skill alone (ibid.:12)."

Experimentation with various types of lithic materials has demonstrated that once a technique of stone-working has been mastered, it may be applied to the working of different types of rock with minimal change:

> Slight modifications of basic techniques may be necessary, depending on whether the material being used is fine-grained and homogeneous like flint, or coarse-grained with relatively poor fracture, like some forms of quartzite or lava (Leakey 1960:31).

Although the quality of the rock does not drastically alter stone-working techniques, it does place limitations on the types of tools that can be made, and as a result "fine" and "crude" working may occur within the same cultural assemblage and not necessarily result from two or more groups (Semenov 1964:39).

This last point is pertinent to the discussion of the lithic materials recovered at FbMi-5 in that they represent a range of textures, from a very fine-grained brown chalcedony to a coarse quartzite. A subjective division of the tools into those that were finely made and those that are comparatively cruder could mistakenly be considered to be a result of cultural diversity rather than a function of the raw material.

The main difficulty in dealing adequately with the lithic composition of the site is that there does not appear to be a general consensus among archaeologists regarding the exact constitution of designations such as "chert" or "Knife River Flint." Accordingly, descriptions of lithic types will be rather cursory and detailed chemical considerations will be omitted. The following materials are represented at the site: chert, brown chalcedony or Knife River Flint, quartzite, granite, basalt, and limestone.

Chert

This term will be used to designate lithic materials exhibiting a regular conchoidal fracture, a coarse crystalline to cryptocrystalline texture, and a wide variety of colors ranging from cream white to grey, pink to deep rust, and pale yellow to orange (Leonoff 1969:12). The rock is hard and dense and consists of cryptocrystalline chalcedony, opal, and crystalline quartz (Simpson 1969:212).

A large majority of the artifacts recovered at FbMi-5 is manufactured from various qualities of chert, ranging from a fine-grained material to a coarse, inclusion-filled type which verges on quartzite and is locally referred to as "Swan River Chert." The finer quality chert appears to have been used for the manufacture of scrapers, projectile points, and the smaller bifaces or knives. It is likely that the finer-grained chert was in short supply as secondary decortication flakes of this type were retouched and used as side scrapers (Plate 19, #4, 82).

In his survey of the lithic materials from surface sites in Manitoba, Leonoff (1969:12) found that the so-called Swan River Chert is very common in archaeological contexts in the west-central part of the province, and that north of Dauphin it may form seventy percent of the lithic remains at a site.

Although no bedrock source of Swan River chert has been found in Manitoba, the place of origin must be nearby, as is evidenced by its relative abundance in archeological sites within the province. One concentration of Swan River chert has been found in an area 200 miles west of the Manitoba Saskatchewan border and 100 miles north of the Red Deer River. According to Leonoff (1969:29) the greatest concentration of Swan River chert is in the Swan River Valley between the Porcupine and Duck Mountains, a natural land or water transportation route from the Saskatchewan prairies into the Manitoba lowland. The use of the Swan

River chert in this region is so great as to preclude the use of other materials on a similar scale. "Only small quantities of other material types occur at all in the Swan River region (Leonoff 1969:54)."

Brown Chalcedony/Knife River Flint

Brown chalcedony will be defined as being a fine-grained quartz which is translucent, non-porous, has a conchoidal fracture, and is dark brown in color. Layers of light and darker material give a mottled appearance in some cases (Clayton, Bickley, and Stone 1970:287).

Weathered surfaces exhibit a white to light grey calcareous patination (Leonoff 1969:8). Chalcedony is a siliceous deposit composed of quartz and opal (Simpson 1969a:211).

Four brown chalcedony end scrapers were recovered at the site, two of which were surface finds. Two fragments of brown chalcedony side scrapers were also excavated at FbMi-5. The presence of the chalcedony artifacts is of special interest because brown chalcedony is not known to be native to the area.

There are two known sources of brown chalcedony or Knife River flint, one in North Dakota, and the other in the Souris River gravels. The flint quarries of the Knife

River Valley of the Dunn and Mercier counties of North Dakota have been well documented (Clayton, Bickley, and Stone 1970). The Knife River flint from North Dakota was used extensively by the prehistoric inhabitants of the plains and Midwest because of its conchoidal fracture and superior falking qualities.

Hlady (1965:6) has reported the occurrence of brown chalcedony in the Souris gravels and is of the opinion that it is within the range of variation in color and texture found at the quarry sites in North Dakota. Although there have been reports of brown chalcedony cobbles weighing up to ten pounds in the Souris gravels, these reported finds have not been substantiated to the writer's knowledge.

In Leonoff's (1969:22) opinion, the Knife River flint used by the prehistoric peoples of Manitoba likely originated in North Dakota because of its superior flaking quality which corresponds to the good quality of the brown chalcedony found in Manitoban archaeological contexts; the discovery of a cache of "blanks" near Treherne, and the poor quality of the chalcedony in the Souris gravels. Additionally, to the present writer's knowledge, Hlady has not satisfactorily demonstrated that the brown chalcedony present in the Souris gravels was exploited by the early inhabitants of Manitoba. Brown chalcedony has been found in the glacial drift of Minnesota (Bleed 1969: 13) and it is possible that it is present in moraine deposits in Manitoba as well. If the brown chalcedony occurs in the beach ridge behind the site, all of the raw materials could have been obtained locally.

Quartzite

Quartzite is a hard, granular, metamorphosed sandstone, ranging in color from a cream white to a light grey.

Large pieces of quartzite were excavated at FbMi-5, most of these in the form of split, water-worn cobbles. The ovoid shape of the cobbles from which the halves originated produced a plano-convex edge-profile which when unifacially retouched resulted in an edge which could have functioned as a biface. The tools shaped from the cobble fragments appear to have served as a chopper, bifaces, and scrapers. None of these quartzite artifacts show heavy wear along the working edge and the writer would conclude that they were made at the site and discarded or abandoned because of their bulk or because of the difficulty of sharpening them or modifying the edge once it was no longer functional. It is likely that the quartzite was locally acquired as it is heavy and fractures irregularly and accordingly would not likely be valued enough to be transported long distances, in contradistinction to the chalcedony and possibly some of the cherts. In all likelihood, the quartzite cobbles were collected along the beach ridge behind the site or in one of the nearby fluvial channels.

Basalt

The term basalt will be used to refer to a fine-grained igneous rock ranging from black to greenish black in color (Simpson 1969:127).

Nine pieces of basalt were recovered during the excavation of the site. These include three choppers, two hammerstones, one possible scraper, one pebble, and two waste fragments.

As was the case with the quartzite, most of the basalt appears to have been gathered in the form of water-worn cobbles, probably from the same source as the former.

Granite

The term granite denotes a granular crystalline rock composed of varying amounts of quartz, orthoclase feldspar, and a ferromagnesian mineral (Simpson 1969:103). The color and texture of the granite is fairly uniform in the sample, and the granite was probably gathered from the same source as the basalt and quartzite.

Thirteen pieces of granite were recovered from the excavations at FbMi-5, including six large and small water-worn cobbles which appear to have served as hammerstones, one pebble, one core fragment, and five amorphous pieces.

Limestone

Limestone is a dense, coarsely crystalline sedimentary rock consisting chiefly of calcium carbonate, and is relatively soft and buff in color. Several pieces of limestone were excavated at the site, but their function is not apparent (Plate 7).

Lithic Summary

With the exception of the six chalcedony or Knife River flint artifacts, all of the tools were manufactured from materials that were available locally. No quarrying would have been required, and the water-worn condition of the cortex of the chert, quartzite, basalt, and granite bespeak an eroded beach ridge for their origin. The method of entry of the brown chalcedony or Knife River flint remains problematical but may indicate that some trade was carried on in the region to supplement local lithic materials.

The utilization of locally occurring materials is typical of the Archaic adaptation to local conditions and resources as noted in other areas (Byers 1959:232, Jennings 1968:110).

TABLE 29

TABLE OF LITHIC COMPOSITION OF FbMi-5 RECOVERIES

Excavated Lithic	Chert	Quartzite	Granite	Basalt	Chalcedony
Projectile Points	10	0	0	0	0
End Scrapers	22	0	0	0	2
Side Scrapers	43	0	0	0	2
Bifaces	40	1	0	0	0
Choppers	3	0	0	0	0
Hammerstones	0	0	4	2	0
Cores	19	1	1	0	0
Flakes	7173	33	53	25	6
Miscellaneous	100	13	6	8	0
Associated Limestone	(15)				
Totals	7410	48	64	35	10
Percentages	97.92%	.63%	.84%	.46%	.13%
Surface Finds					
Projectile Points	12	0	0	0	0
End Scrapers	11	0	0	0	2
Side Scrapers	23	0	0	0	0
Bifaces	23	0	0	0	0
Flakes	459	4	4	0	0
Miscellaneous	0	0	0	0	0
Associated Limestone	(5)				
Totals	528	4	4	0	2
Percentage Totals	98.14%	.74%	.74%		.37%

CHAPTER III

THE FAUNAL REMAINS

A large number of bone fragments, exceeding 4,870, were excavated at the site. The majority of the osteological remains from FbMi-5 are *Bison bison*, with limited representation of *Lupus americanus* and possibly *Canis lupus* (Table 30). The fragmentary nature of the material precludes the determination of the exact number of individuals present, but at least one bison, two rabbits, and one wolf appear to be represented. These species are not especially indicative of seasonality in that they may be hunted throughout the year. Given the territorial range for these animals, their presence at the site does not indicate that there has been marked environmental change at the site since the prehistoric occupation.

The fragmentary nature of the bone would appear to be the result of cultural practices continuous with the historic period and indicate maximum utilization of food resources. This point will be discussed further in the concluding chapter of this thesis.

The presence of the bison foot bones and skull fragments suggests that the bison kill occurred near the site,

TABLE 30

IDENTIFIABLE BONE FRAGMENTS OF *BISON BISON*

Bone Fragment	Position		
	Right	Left	Unassignable
Radius	1	-	-
Sesamoid	-	-	1
Tibial Tarsal	6	4	-
Metatarsal	3	1	2
First Phalanx	1	3	1
Second Phalanx	2	3	1
Radial Carpal	-	2	-
Intermediate Carpal	-	1	-
Accessory Carpal	-	1	-
Ulnar Carpal	1	-	-
Metacarpal	-	-	1
Second-third Carpal	2	1	-
Third Carpal	-	1	-
Fourth Carpal	3	1	-

if not at the site, as the feet and skull were usually left at the butchering area; they were not a valuable source of meat and were not worth the expenditure of energy required to transport them to the habitation site:

> As has been pointed out numerous times, the head, as a whole, is a heavy unwieldly part of the animal and is covered at the most with a minimum amount of usable meat; hence it was not usually transported from the kill to the village (Miller 1964:235).

This statement has been supported by various authorities including White (1953, 1954) in his work on butchering techniques.

Burnt bone present in the sample may demonstrate that the people occupying FbMi-5 had the use of fire, probably for cooking and heating. Fire from a natural cause such as lightning would likely char all of the bone whereas this is not the case at the site.

It should be emphasized that the quantities of bone in Table 19 represent fragmentary remains and not whole bones. The faunal remains are extremely fragmentary, which hinders identification and the estimation of the numbers of individuals present.

Bison bone submitted for carbon dating included assorted tooth fragments, two astragalus fragments, fragments of carpals and tarsals, two phalange fragments, and one tibia fragment.

Lepus americanus is represented by the distal end of the left humerus, a proximal fragment of the right tibia, one complete left mandible, and two midsection fragments of the left mandible. One upper molar was submitted for carbon-14 dating.

Remains of *Canis lupus* found in the sample include a proximal fragment of the right tibia and a molar fragment. The articular facet of the right mandible was used in the radiocarbon dating of the site.

CHAPTER IV

POLLEN SAMPLES AND CARBON-14 DATING

One of the best tools in paleoenvironmental reconstruction is palynology in that the ancient floral components, and hence paleo-climates, may be inferred through pollen identification and interpretation. The following outline of the vegetational sequences in Manitoba, as indicated by regional pollen studies to date, will serve as a context in which to view the pollen data recovered at FbMi-5.

Vegetational Sequence in Manitoba: 8050 B.C. to 50 B.C.

The Wisconsin Ice Age destroyed all of the flora that had existed in the province prior to its advance. The following discussion is restricted to the vegetational sequence following the retreat of the Wisconsin ice sheet, and will be based on research done in the province by Ritchie (1969, 1969a) and Rowe (1956).

The first portion of the province invaded by flora was the southwest. In the southern areas prior to 8550 B.C., the dominant vegetation was a spruce, soapberry, and sagebrush association, with mesic sites hosting a spruce-soapberry community, willow and poplar occupying the moister areas, and juniper growing in the driest sites (Ritchie 1969a:1343, 1969:229). Rowe (1956:30) is of the opinion that the original boreal forest migrated into the region from the west:

> It seems fairly certain that the lowlands east of the Cretaceous scarp in Manitoba and North Dakota provided an effective barrier to plant migrations from the east throughout much of the last glacial age, since it must have been successively occupied by ice, water, or swamp and marsh, depending on the phase of glacial advance or retreat.

As the ice retreated northeast and northward across the prairies west of the Escarpment, an area open for plant colonization existed to the west before it existed to the east. Additionally, both the drainage patterns and prevailing winds facilitated plant migration from the west, while hampering similar movement from the opposite direction (Rowe:32).

About 8050 B.C. there was a decrease in the amount of spruce, which was succeeded by a largely treeless assemblage dominated by grasses and forbs, along with willows, juniper, and *Shepherdia argentia*. The increase in chenopods, ragweed, *Artemesia*, and other composites was likely due to a warmer and drier climate.

About 4550 B.C. *Corylus* began to appear in increasing amounts which may indicate that there was a greater amount of Populus present than is apparent from the pollen diagrams. Ritchie (1969a:1348) suggests the poplar may have been present in an association similar to the present day Aspen Parkland. Concurrent with the rise in hazelnut was the decline of juniper, grass, and herb pollen, and Shepherdia argentea disappeared.

According to the pollen diagrams from Riding Mountain, located one hundred miles south of Swan River, there was a marked change in vegetation around 550 B.C. At this time Pinus, Picea, Larix, Betula, Quercus, Alnus, and some Abies were well represented. The immigration of the boreal trees and shrubs was probably in response to cooler and moister conditions. The present vegetation of the region is similar to that of this period (Ritchie 1969:251). Basal peat dates from various parts of Canada coincide with Ritchie's date of 550 B.C. for the expansion of the boreal forest into west-central Manitoba (Table 31).

The Pollen Data for FbMi-5

Given this brief summary of the vegetational, and by inference the climatic, sequence for the province, the pollen data from FbMi-5 may now be examined. A total of nine peat samples was taken in vertical sequence one meter east of the N5 peg for pollen analysis. Table 30 gives the percentages of the pollen of the different plant genera that were represented in the samples.

The pollen in the samples was poorly preserved and sparse throughout the column collected. As can be seen from Table 30, the pollen in all of the samples in and above the contact (occupation) zone reflects the peat-forming vegetation presently found at the site. The lower samples from the mineral context have diminished quantities of _Picea mariana_ and _Larix_, and a higher percentage of _Pinus_ and _Graminae_. In the lowest sample, from ten centimeters below the Contact/Occupation Zone, there is a high Cyperaceae count, making it possible to surmise that a grassland predated the peat-forming forest. McAndrews (written communication to Pettipas) is of the opinion that a cooling trend accompanied by reduced evaporation caused the southward expansion of the boreal conifers, including _Larix_ and _Picea mariana_, between 50 B.C. and 1050 B.C. Concurrent with the southward migration of the boreal forest was the initiation of peat accumulation.

The build-up of the sphagnum in the moist depressional area along the relict beach ridge encouraged the growth of the _Larix_ and _Picea_ mariana at the site, and may have been able to maintain their growth through drier

TABLE 31

POLLEN PERCENTAGES FROM FbMi-5

Pollen Genera	*AC-30	AC-25	AC-20	AC-15	AC-10	AC-5	C-0	BC-5	BC-10
PICEA	19.6	37.0	52.6	38.9	21.5	18.3	19.0	7.6	3.8
ABIES	-	-	0.4	-	-	-	-	1.1	-
LARIX	13.5	11.1	6.1	5.5	4.8	3.2	3.8	-	1.0
THUJA/JUNIPERUS	-	-	-	0.4	-	-	-	-	-
PINUS	38.2	29.8	26.1	48.1	57.5	59.7	61.5	59.8	62.9
BETULA	3.0	3.7	2.4	2.2	1.8	2.0	3.4	3.3	2.9
POPULUS	0.7	-	-	-	-	-	-	-	-
ULMUS	-	-	-	-	-	-	0.4	-	-
SALIX	0.7	0.9	-	0.4	0.9	0.4	0.4	1.1	1.0
ALNUS	6.8	5.5	3.7	6.2	5.6	5.7	3.4	5.4	4.8
ELAEAGNUS	0.3	-	-	-	0.4	-	-	-	-
CORYLUS	0.7	-	-	0.4	-	-	-	-	-

(cont'd)

TABLE 31 (cont'd)

Pollen Genera	AC-30	AC-25	AC-20	AC-15	AC-10	AC-5	C-0	BC-5	BC-10
SHEPHERDIA CANADENSIS	0.3	0.4	-	1.5	0.9	-	0.4	-	-
ERICACAE	-	0.4	-	-	-	-	-	-	-
GRAMINEAE	1.7	0.9	0.8	1.5	1.3	2.0	1.3	7.6	6.8
ARTEMISIA	1.7	2.6	2.0	2.2	0.4	0.8	-	3.3	1.9
AMBROSIA	-	-	-	1.1	-	-	-	2.2	-
TUBLIFLORAE	-	1.3	1.2	1.1	0.4	2.0	0.8	1.1	1.9
LIGULIFLORAE	-	-	-	-	-	-	-	1.1	-
CHENOPODIIINEAE	0.3	-	0.4	0.7	-	0.4	0.4	1.1	-
CAROPHYLLACEAE	0.3	0.4	-	-	0.4	-	-	-	-
ONAGRACEAE	-	-	-	-	-	-	-	-	1.0
LYCOPODIUM	0.3	0.4	-	-	0.4	0.4	-	-	-
SPHAGNUM	6.4	3.0	3.3	3.3	3.1	4.1	3.4	4.3	6.8
EQUISETUM	1.7	0.4	-	-	-	-	-	-	-

(cont'd)

TABLE 31 (cont'd)

Pollen Genera	AC-30	AC-25	AC-20	AC-15	AC-10	AC-5	C-0	BC-5	BC-10
CYPERACEAE	3.4	2.1	1.2	2.9	0.4	1.2	1.7	1.1	5.7
TYPHA SATIFOLIA	0.3	-	-	-	0.4	-	-	-	-
INDETERMINABLE	7.1	3.4	6.1	7.3	11.4	13.0	16.0	28.2	24.8
UNKNOWN	0.7	0.4	-	-	0.4	0.4	-	-	-
PRE-QUATERNARY	-	-	-	-	-	-		3.3	1.0

* AC designates those zones above the occupation level

C designates the occupation zone (between peat and the underlying mineral deposit)

BC designates those zones below the organic-mineral contact periods.

The pollen contents of the spectrum above the Contact Zone appear to coincide with the regional dominance of boreal species that was established in the area about 550 B.C. and which has essentially remained intact ever since. There remains the possibility that shorter climatic episodes might have changed too rapidly to be reflected in pollen sequence, one of several problems associated with the interpretation of pollen diagrams.

Macrofloral Remains

A number of small seeds was recovered during excavation. All were found in the contact zone at the northern end of the site (7N 1W, 8N 1W, 9N 0E, 10N 0E, 10N 1W), but appear to have been scattered rather than concentrated at any one locus. These seeds have been identified as pin-cherry (*Prunus pennsylvanica*) by Mr. S. Macauley (personal communication to Pettipas). Their presence may indicate that the accupants of FbMi-5 were exploiting the flora as a food resource, although there also exists the possibility that the seeds were intrusive, having been carried into the immediate area as the local environment became increasingly moist.

Dating of FbMi-5

Two samples from FbMi-5 were submitted for radiocarbon dating. The first consisted of 525 grams of bone which had been collected from the cultural horizon in 1968. The bone, which had not originally been intended for carbon dating, had been washed and handled prior to being submitted. Therefore it may have been contaminated. This first sample yielded a date of 2320 ± 130 B.P. (GSC #1219) or 370 ± 130 B.C. (Lowden, Wilmeth, and Blake 1970: 475).

The second sample submitted for dating was basal peat from beneath about two feet of overlying woody peat (Unit 20N 6W). The count obtained for this sample was 2330 ± 130 before present (GSC # 1308) or 380 ± 130 B.C., which date marks the initiation of the peat formation at the site.

In view of the relationship of the two samples to each other stratigraphically and their methods of collection, it is surprising that the two dates differed by so little. Considering the fact that the bone had not been intended for radiocarbon dating to begin with, it was probably contaminated and the date should be regarded as suspect. Furthermore, samples from shallow peat can be contaminated by the inclusion of roots from recent generations of bog plants. Additionally, there is the possibility that humic materials in solution may move from one level to another (Polach and Golson 1966:31). Be that as it may, the aforementioned review of basal peat dates in Canada demonstrates that between 1050 and 550 B.C., a cooler, wetter period initiated the accumulation of peat deposits (Nichols 1969:63). The following are basal peat deposit carbon dates along with their location as found in Nichols' report (1969:63) and the date obtained at FbMi-5. These data would appear to indicate that the radiocarbon count on the basal peat from the site is accurate and in line with similar deposits elsewhere:

TABLE 32

RELATED BASAL PEAT DATES

Date Before Christ				
380±130	(GSC #1308)	52°10'N	101°31'W	FbMi-5
380±150	(GSC #300)	66°32'N	103°15'W	MacKenzie District
400±200	(Lamont #219)	51°28'N	78°45'W	Quebec
430± 90	(WIS #1)	54°07'N	101°17'W	Manitoba
460± 60	(WIS #269)	53°55'N	106°03'W	Saskatchewan

The amount of time that elapsed between the occupation of the site and the beginning of the peat growth is not known, and the relationship between the two events is difficult to assess. At best, the date obtained from the peat places an upper limit on the date of the occupation of the site.

It should be noted that the pollen data and the peat date complement one another. This fact would further support the validity of the peat data and indicate that the site was occupied prior to 380 ± 140 B.C. during the suggested drier grassland phase which preceded the more moist peat-forming stage.

CHAPTER V

THE ARCHAIC STAGE AND FbMi-5

On the basis of the projectile point styles present, the carbon-14 date from the basal peat, and the absence of pottery in the excavated area, FbMi-5 has been designated an "Archaic" occupation. There are, however, inherent problems surrounding this concept and its use at FbMi-5. These are discussed below.

The Archaic Stage

The primary problem confronting those dealing with the Archaic stage is that it has never been adequately defined, despite numerous attempts to do so by various archaeologists (Byers 1959, Willey and Phillips 1958). Ritchie is usually cited as having coined the term "Archaic" in 1932 in reference to a particular northeastern cultural stage (Willey and Phillips 1958:105). Subsequently, this term was used to refer to cultures falling within the second stage of North American prehistory, preceded by the Paleo-Indian, and followed by the Formative or Woodland stage.

The Archaic stage in the Eastern United States and Canada began about 7,000 or 8,000 years before Christ and lasted in some areas up to historic times (Jennings 1968: 110, Mayer-Oakes 1960:102, Ritchie 1965:32, Willey 1966: 102). According to Wedel (1964:20), the Archaic stage did not begin on the plains until 2000 to 5000 B.C., about the same time as the Altithermal.

The development of the Archaic stage is generally attributed to changing subsistence modes brought on by changing climatic patterns which resulted in new floral and faunal assemblages. Archaic peoples were adapting to changing environments. They no longer depended overwhelmingly on the big game animals as had the Paleo-Indians, but became much more diversified in their subsistence activities. In the eastern areas of North America, with which FbMi-5 shares certain material traits, small game hunting, fishing, and gathering was practised and thus the environment could be exploited more fully (Willey 1966:60, Willey and Phillips 1958:107, Spencer and Jennings 1965: 39).

The definitive emphasis on the readaptive nature of the Archaic cultures permitted the inclusion of a great many prehistoric groups under the one term by allowing for regional differentiation:

> . . . divergences among sites and regional variations of Archaic cultures might be resolved by

> regarding the Archaic as a cultural stage, spread across the continent and modified by environmental conditions to which response was made in a way best suited to meeting local problems of subsistence (Byers 1959:232).

This lumping in turn confused or blurred the definition of the culture stage itself. In an attempt to clarify variations in different areas, subdivisions were set up to include only those material cultural manifestations particular to a given region. The result is a series of divisions such as "Shield Archaic," "Desert Archaic," "Boreal Archaic," and "Plains Archaic."

Another major problem is that there are relatively few sites of the Archaic stage which have been excavated in the northeastern plains of the United States, and even fewer in Canada. The resulting lack of comparative data on temporal sequences within the Archaic introduces further limitations on the interpretation of Archaic material.

There are indications that differences in subsistence bases existed between the Archaic people occupying the southern plains (Willey and Phillips 1958:127) and their contemporaries found on the northern plains' periphery. Wormington and Forbis (1965:192) point out that in Prairie Canada there is nothing to indicate that "Archaic" peoples were foragers:

> . . . there are virtually none of the grinding implements characteristically used by plant collectors; animal bones from sites in southern Alberta and Saskatchewan are always predominantly of buffalo, no matter how insignificant the site may be.

This statement appears to hold true for FbMi-5 and the Steep Rock Lake site in west-central Manitoba, situated to the north of FbMi-5 (Simpson 1970). No grinding stones, characteristic of the Archaic assemblages to the south, were recovered at FbMi-5. It is possible that the occupants of the site did exploit floral resources of the region, but artifactual proof is lacking at present. The chance that some of the hammerstones recovered in excavation were used to process vegetable foods must remain conjectural.

It would appear that FbMi-5 does not readily lend itself to categorization with respect to the existing historical-developmental schemes. The subsistence refuse from the site points toward a big game hunting emphasis rather than a highly diversified economy of the sort generally attributed elsewhere to the Archaic stage of culture. Additionally, the projectile point assemblage argues against close Paleo-Indian affiliations, while the absence of pottery in the artifact sample precludes a Woodland context. The carbon-14 date from the peat serves to place the material in an intermediate, pre-ceramic time level.

Perhaps the most realistic manner of handling data such as that from FbMi-5 is that suggested by Forbis (1968: 7-9), who has argued against "importing" schemes from elsewhere to give order to the prehistory of the Canadian Plains. Forbis (1968:40) has made the following statement:

> It is far more realistic, in reconstructing human history on the Northwestern Plains, to emphasize the concept of tradition rather than to break the continuity into a series of successive stages. . . . the tradition is there from Folsom times to the protohistoric; it is the tradition of wandering foot nomads almost wholly dependent on buffalo for food, clothing and shelter. . . . there appear to be few changes in the basic tool assemblages from the beginning to the end of the tradition. The odd grinding slab does not an Archaic make; . . .

If there is anything "Archaic" at all about the FbMi-5 assemblage <u>per se</u>, it is the projectile points. They exhibit stylistic similarities with a point tradition those origins apparently lie in the forested region to the south and east.

Temporal and Cultural Comparisons

The most diagnostic artifacts excavated at FbMi-5 were the projectile points; therefore, temporal and spatial comparisons are of necessity based on morphological similarities between the points found at this site and others on the Plains.

The majority of the projectile points are side-notched, with some corner-notched and basally-notched points being present (Plates 11 and 12). Most of the side-notched points have their closest stylistic affinities with those found at Logan Creek, Turin, Simonsen and the Hill sites of Nebraska and Iowa (Fig. 11).

The convex-based side-notched points found in level A at the Logan Creek site in Nebraska are similar in outline to those from FbMi-5 and fall within the same size range. In level B, straight-based side-notched points similar to those from FbMi-5 were found to date at 4683 ± 300 B.C. (M-837). Kivett (1962:5) thought that the point from the Turin burial, dated at 2770 ± 250 B.C. (M-932), had some relationship with the Logan Creek Complex. The point associated with the Turin burial is side-notched with a concave base. The projections at the basal corners are rounded and basal thinning is present (Frankforter and Agogino 1959:487).

Kivett further stated that the Logan Creek points have similarities in style with those recovered at the Simonsen site dated at 6480 ± 520 B.C. (UW-79). The points recovered at the Simonsen site in Iowa are triangular, side-

ARCHAIC SITES DISCUSSED IN THE TEXT

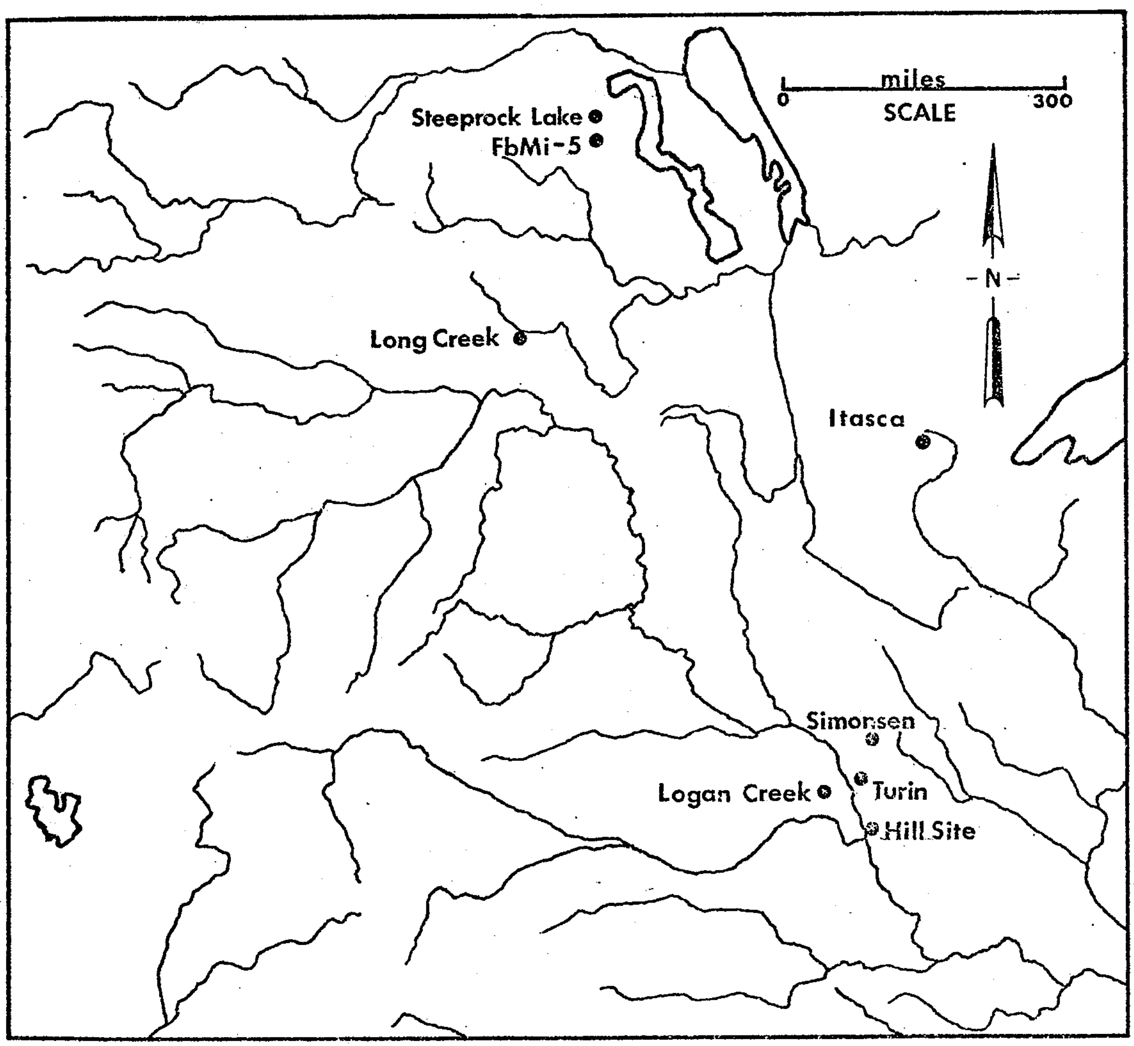

FIGURE 11

notched, and concave-based. Agogino and Frankforter (1960:415) are of the opinion that the points at this site are similar to the previously mentioned Turin and Logan Creek sites, and to the Hill site.

The Hill site in Iowa dates to 5300 ± 300 B.C. The projectile points at this site are side-notched with convex edges and concave bases. Bison bone found at this site was badly smashed and some of it was burned, as was the case at FbMi-5.

Shay (1971:19) recovered side-notched points similar to those mentioned thus far at the Itasca Bison Kill in Minnesota in levels dated between 6420 ± 250 B.C. (I-3085) and 80 ± 130 A.D. (M-1728). The Itasca side-notched points are not as well made as those from FbMi-5, although their general outline is similar (Shay 1971:55, Fig. 27).

Closer to the Swan River area is the Long Creek Site in Saskatchewan. Mayer-Oakes (1960:103) stated that the side-notched concave-based points from Long Creek were "practically indistinguishable" from those found at Logan Creek in Nebraska. The Long Creek site is located southwest of FbMi-5 and north of Logan Creek, Simonsen, Hill and Turin (Fig. 11). The level in which these side-notched points were found dated at 2693 ± 150 B.C., much closer temporally to FbMi-5 than any of the American sites.

A Manitoba site with similar point styles is found at Steeprock Lake, to the north of FbMi-5, in the Porcupine Mountains. A triangular, side-notched, concave-based point was recovered in level A, above level B dated at 1180-110 B.C. (NMC-272). Simpson (1970:40) compared his points with those found at the Logan Creek and the Simonsen site and considered his date too recent for the point styles he recovered. It is possible that both FbMi-5 and the Steeprock Lake site represent a late Archaic occupation of the North eastern Plains periphery, but again, the former has not been satisfactorily dated.

One of the bases excavated at FbMi-5 (Catalogue #272) resembles an Oxbow type with its rounded ears and concave base (Plate 11). The occurrence of an Oxbow point with other Archaic side-notched points has been noted in Saskatchewan by Kehoe and Kehoe (1968:23):

> Side-notched projectile points similar to Archaic points in the East, and particularly to the points in the Simonsen, Turin, and Logan Creek sites in the prairie midwest, occur in Saskatchewan in early contexts. The Oxbow Dam Site, radiocarbon dated 3250 ± 130 B.C. . . . is the type site for the earlier variety of these Saskatchewan "Prairie Archaic" points.

Interestingly enough, the Kehoes (ibid. 35) are of the opinion that a "Prairie Archaic" was adapted to bison hunting, in keeping with the observations made by Wormington and Forbis (1965:192). The Oxbow assemblages date about 2500 to 3000 B.C. and bison appears to have comprised their main subsistence base (Wormington and Forbis 1965: 116). In his discussion of the Long Creek site, Mayer-Oakes (1960:116) suggests that the Oxbow type developed out of the Eastern Archaic tradition, and Forbis (1970:17) has stated that points from the Simonsen site and Logan Creek are "generally comparable" to Oxbow although they are of an earlier age. Thus the occurrence of what appears to be the base of an Oxbow point (Plate 12) at FbMi-5 is in keeping with the other point styles present.

CHAPTER VI

SITE UTILIZATION AND LOCALIZED ACTIVITIES

Archaeölogical and ecological data recovered at FbMi-5 have been discussed in previous chapters and limited cultural and temporal comparisons have been made. At this point in the paper interpretive statements regarding the site proper will be presented. It must be kept in mind that these conclusions are of a tentative nature because of the sampling problems at the site and the general lack of comparative material problems all too common for the archaeologist in Manitoba.

The site, or at least that part of the site that was excavated, has been termed a campsite, partially on the basis of negative evidence; that is, there is no evidence to indicate that it was otherwise. There is nothing to indicate that the site was specialized to serve ceremonial needs, nor that it was specifically a quarry or a kill site, nor is there evidence of prolonged habitation at the site. There are, however, cultural manifestations indicating a group of people occupied the site for a short period and carried on a variety of activities at the locale.

The large amount of lithic detritus scattered throughout the site indicates that some tool manufacturing was carried out. Whether or not this tool manufacturing constituted a primary activity during the site's occupation is not clear. The large percentage of the raw materials represented at the site indicates that local sources of lithics suitable for tool manufacture were being exploited. All of the core material could have been gathered from the strandline directly behind the site.

In addition, local fluvial channels, both of glacial and post-glacial age, would have exposed local morainic deposits to aboriginal peoples who could then have easily exploited the crypto-crystalline materials.

Broken artifacts recovered at the site may indicate that tool manufacture was necessary to replace the tools broken at and away from the site. Some of the relatively smaller flakes present likely resulted from on-the-spot sharpening or modification of the stone tools being used in subsistence activities.

Hunting was likely carried on near the site as is evidenced by the presence of the bison skull fragments. The occurrence of bison foot bones would further indicate that the kill occurred near the site:

> Since the bison metapodials would materially increase the load, it would appear that the distance from the village would be the deciding

> factor on whether or not they were brought in (White 1954:256).

This weight consideration would be especially important in a small hunting band or family where manpower would be at a premium.

The majority of the bone recovered at the site was fragmented to an extent that cannot be considered to be accidental. The occurrence of smashed bone in archaeological contexts is not uncommon (White 1953:162, Kehoe 1967:70, Zierhut 1967:36) and it would seem logical to apply the principle of ethnographic analogy to explain the phenomenon, with the realization that there may have been other undocumented causes. Accordingly, it is suggested that the bones found at FbMi-5 were likely smashed to extract their marrow, and may have been boiled to extract bone grease. This theory is lent further support by the fact that only some of the bones were burnt, as would be expected in the production of bone grease (Zierhut 1967: 34).

A number of accounts of the production of bone grease are presented to indicate the widespread nature of this trait in the Plains areas, the methods employed, and the portions of the animals utilized. It is tempting to speculate that the ubiquity of this practice and possible evidence for it at FbMi-5 indicates that it is of some antiquity.

An account of the Omaha production of bone grease is as follows:

> The vertebrae and all the larger bones of the buffalo and other animals are used for making . . . bone grease, which serves as butter and lard. In recent times hatchets have been used to crush the bones, but formerly stone axes . . . were employed. . . . The fragments of the bones are boiled, and very soon the grease rises to the surface. This is skimmed off and placed in sacks for future use (Dorsey:1884:303).

The sacks referred to could have been the bladders of the dead buffalo which are known to have been employed for this purpose (Wheat 1972:113).

Robert Jefferson, an early immigrant on the Canadian plains, related the following custom among the Cree on the Saskatchewan River in connection with the butchering of bison: "The marrow-bones were set aside for the time being, to be eventually broken up between stones, and boiled for the fat they contained, a fat much prized (Jefferson 1929:68)." This account indicates that bison bones were being smashed by the Cree in the historic period for the production of bone grease.

Kehoe (1967:70) noted an instance of bone smashing among the Blood Indians who broke up the femur and humerus for the production of "bone butter." Rawhide-covered mauls or berry mashers were used to smash the bone to prevent the inclusion of stone chips. In this case, the fat was used in the production of pemmican. Snow was thrown into the pot of boiling bones during the winter to cake the fat and make it easier to remove with a wooden spoon or piece of horn.

The list of bones smashed appears to vary from group to group. At one site in Montana the humeri, radii, ulnae, femora and tibiae were "split and chopped up." In this instance the bone fragments were reduced to less than four inches in length (Kehoe and Kehoe 1960:422). A contemporary, detailed description of the breaking of moose and deer bones lists the following bones as being used for marrow: humerus, radius-ulna, metacarpals, femur, tibia, metatarsals, and the body of the mandible (Zierhut 1967: 34).

Both large and small mammals were exploited for bone grease, and Densmore (1929:44) noted that among the Chippewa, rabbit bones were processed to obtain bone grease.

> The meat was removed from the bones, roasted and pounded. The bones were then pounded with what meat remained on them. The pounded bones were boiled in a small kettle and the grease skimmed off and eaten with the pounded meat.

Not only were the rabbit bones boiled to extract fat, but the bones were also dried and then ground into a powder which could be mixed with the dried meat and fat (Densmore 1929:44). Such a practice would destroy small animal bones and skew dietary interpretations based on osteological remains.

It is possible that the people occupying FbMi-5 had a heavier reliance on small mammals as a food source than is evidenced by the paucity of such remains at the site. From Table 19 it will be noted that the only rabbit remains were the mandibles. Perhaps Densmore's observations among the Chippewa could explain the absence of additional skeletal remains. It is also possible that sampling problems have influenced the osteological sample, keeping in mind the conditions of excavation.

The tool assemblage itself is diversified and representative of technological and subsistence modes on the Plains up to historic times. Scrapers, both end and side, were the most abundant artifacts found at the site. As these tool types were multipurposed, being used for hide preparation, wood and bone working, and cutting, not much may be said of their exact function(s) at the site (Semenov 1964, Frison 1968). The projectile points recovered were likely used for killing game, although once again, they could have served many purposes (Ahler 1970). Bifaces and choppers present at the site indicate that some butchering and food preparation was carried on. The choppers and hammerstones could have been used to smash bone. Bone does not appear at the site in the form of artifacts, but this could be due to sampling problems as bone is known to have been used for tools in adjacent areas throughout prehistory.

In that FbMi-5 is located adjacent to the most dominant physiographic feature in the vicinity, namely the strandline, possible relationships between the people occupying the site and the beach ridge will be discussed at this point in the paper.

The juxtaposition of the site and the beach ridge may have occurred for one, if not all, of the following reasons: 1) it was a source of raw materials for people with a lithic technology; 2) it served as a migration route; and 3) it constituted a source of ground water that fed a pond that existed in the area of the site.

In addition to providing a local source of raw material, the beach ridges were important trails or "highways" for the early occupants of the region. The use of these ridges or beaches is well documented for the late 1800's by the first explorers and geographers in the area. Hine (in Warkentin 1969:211) mentions the use of a gravel ridge at the time of his visit in 1858: "In the rear of

Dauphin Lake, the next ridge in the ascending series occurs, it forms an excellent pitching track for Indians on the east flank of Riding Mountain." Tyrell (1892:6) states that he followed the "rounded gravel ridges, known to the Indians as 'Pitching Ridges,'" when he was doing his survey of the area.

There were two main reasons why these ridges were used as trails or transportation routes by the Indians and early Whites: they were well drained and often treeless. Tyrell (1892:8) found that some of the swampy land was "impassible for horses" and had to stay on the gravel ridges. He later described the ridge as being "devoid of timber and thinly grassed on top and on it the Indians have one of their main trails into the country to the north (Tyrell 1892:90)." Upham (1890:405) also realized the utility of the beach ridges:

> Where most conspicuously developed the beaches are covered, as a rule, with only a meagre growth of short grass. . . . They thus often form beautiful dry roads through country that would otherwise be an impenetrable forest.

The antiquity of the use of the beach ridges for transportation routes is not known, but it is likely that they were used in prehistoric times. This factor could in large part explain the occurrence of the site adjacent to the ridge.

Conclusions

On the basis of the data presented in this paper, it may be stated that FbMi-5 is a prehistoric campsite which likely represents an "Archaic" occupation predating 380 ± 130 B.C. The site may be representative of the undefined "Prairie Archaic" discussed by Kehoe and Kehoe (1968:23). The presence of the bison bone and the projectile point types that are morphologically similar to those found in the "Prairie Archaic" sites in Saskatchewan support this suggestion. The site may represent a nomadic incursion of people with affiliations with the south and east, but these relationships, based solely on projectile point similarities, are unclear and tenuous at present.

In that the major problem in assessing the value of the material recovered at FbMi-5 has been the sampling limitations, further work is required at the site to make it more useful in the study of Manitoba prehistory. A more randomly-oriented excavation, with the aid of pumping equipment to control seepage, would recover a further artifact sample and activity areas might be discerned which would greatly aid cultural reconstruction.

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PLATES

Plate 1. FbMi-5 facing west from the road showing the excavated squares and vegetation

Plate 2. Second view of the site from the road showing water in units

Plate 3. Unit 12N OW facing north showing tree cover

Plate 4. North wall unit 1N OE showing overlying humic layer, contact zone and clay

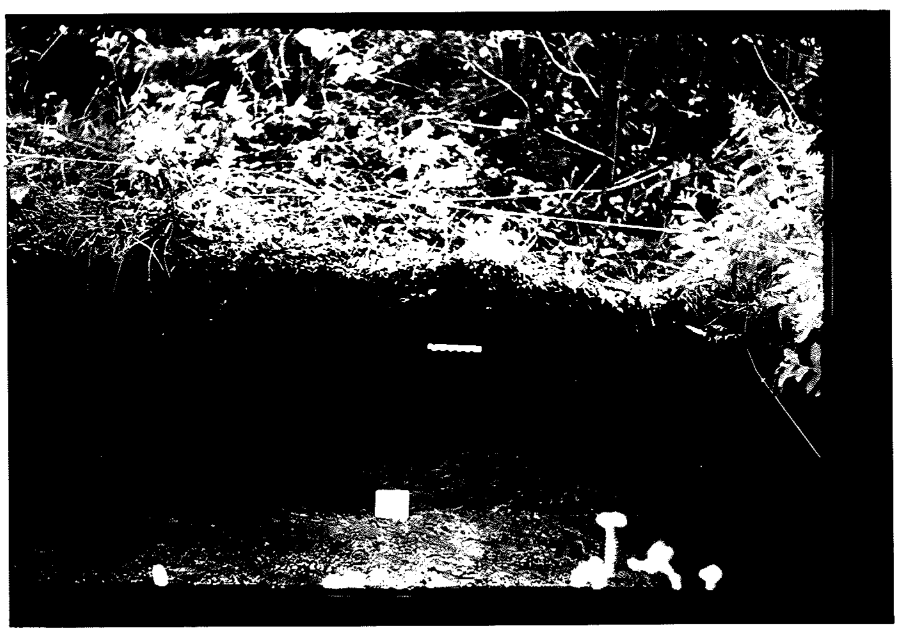
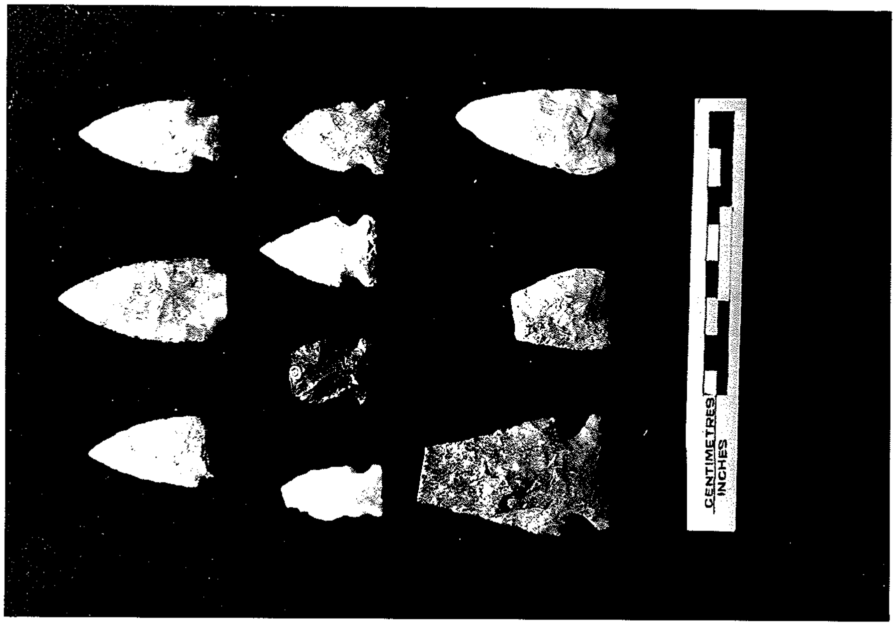


Plate 5. North wall 5N OE showing soil profile

Plate 6. South wall of unit 12N 6W showing natural disturbance (solifluction?)

Plate 7. Surface Projectile Points

Plate 8. Excavated Projectile Points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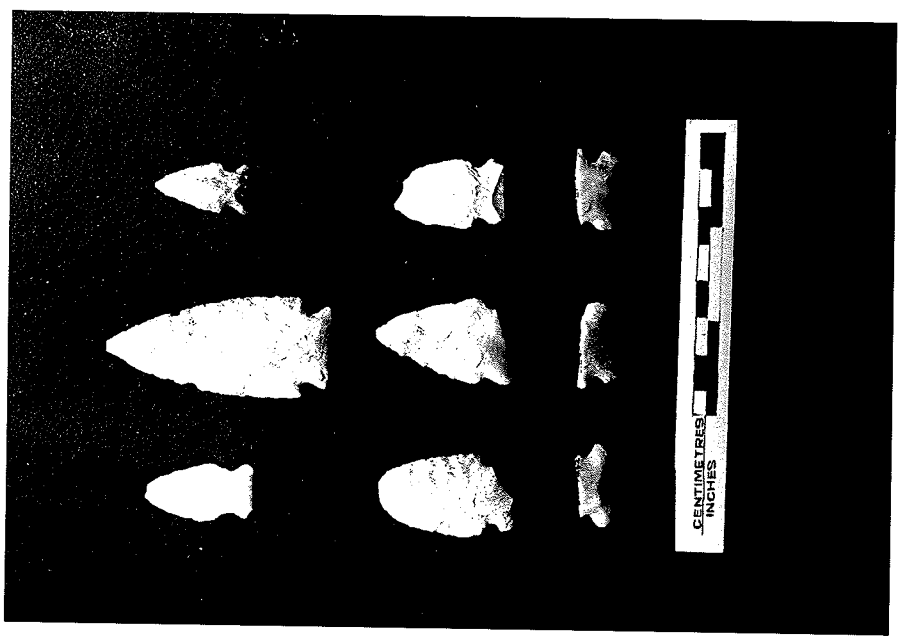
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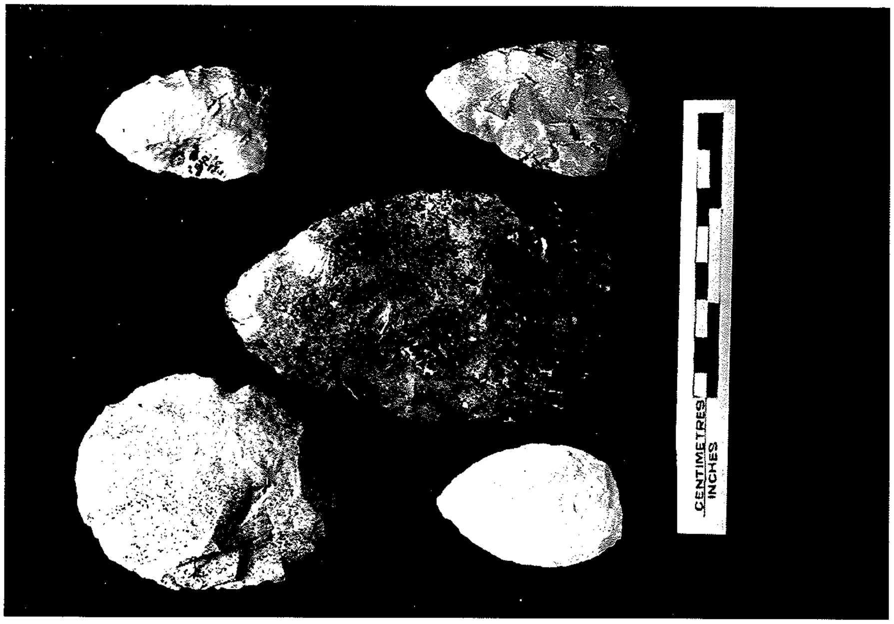
Plate 9. Surface Bifaces

Plate 10. Excavated Bifaces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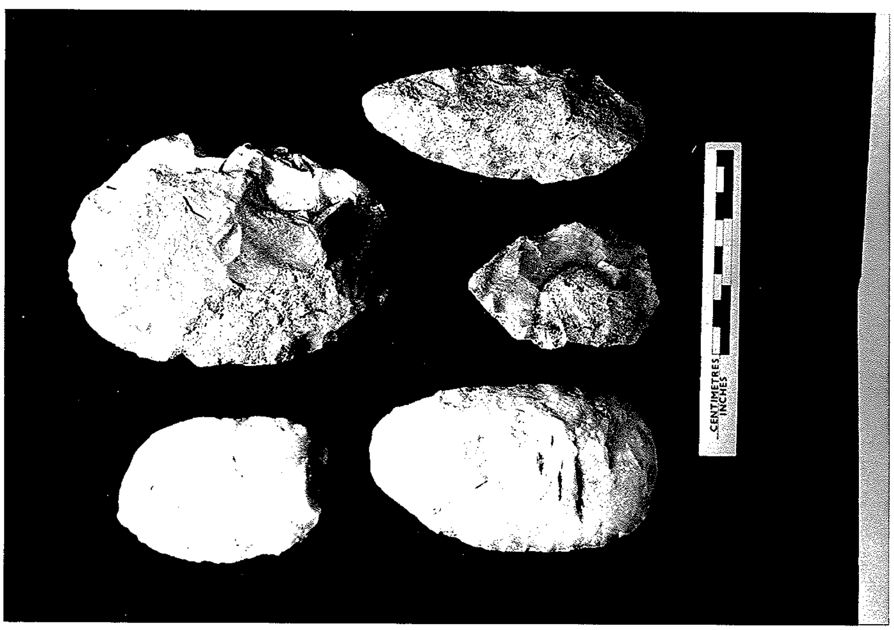
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Plate 11. Surface End Scrapers

Plate 12. Excavated End Scrapers


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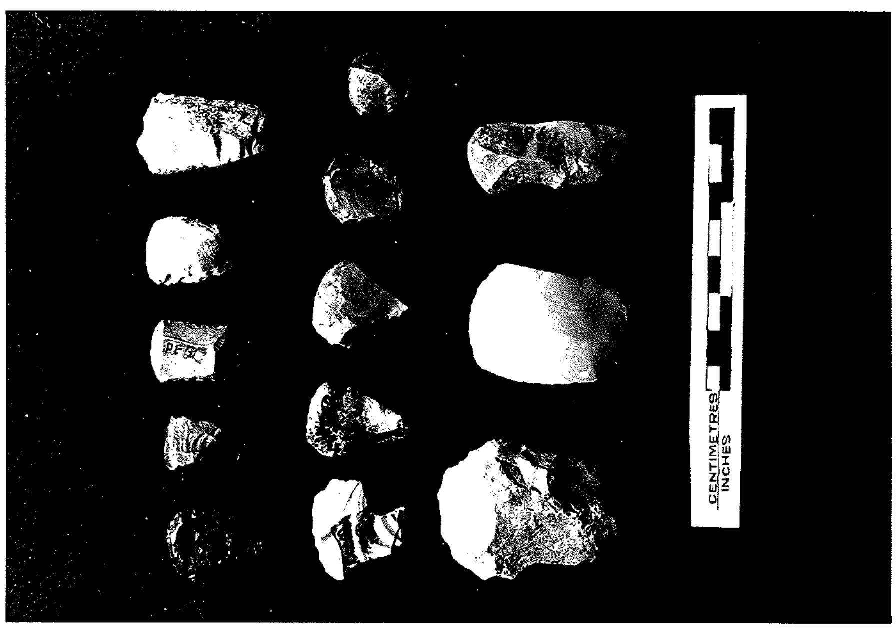
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Plate 13. Excavated Side Scrapers

Plate 14. Excavated Chopper


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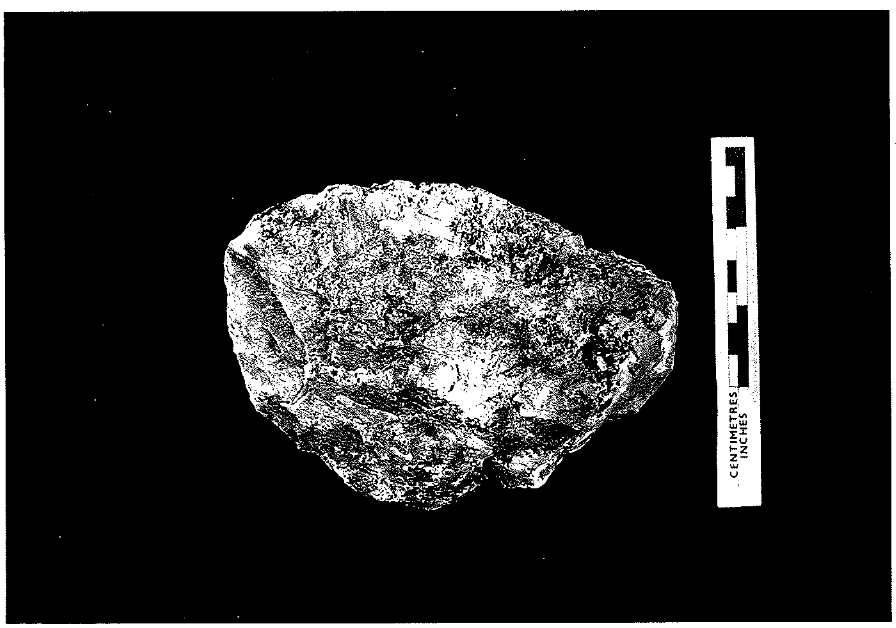
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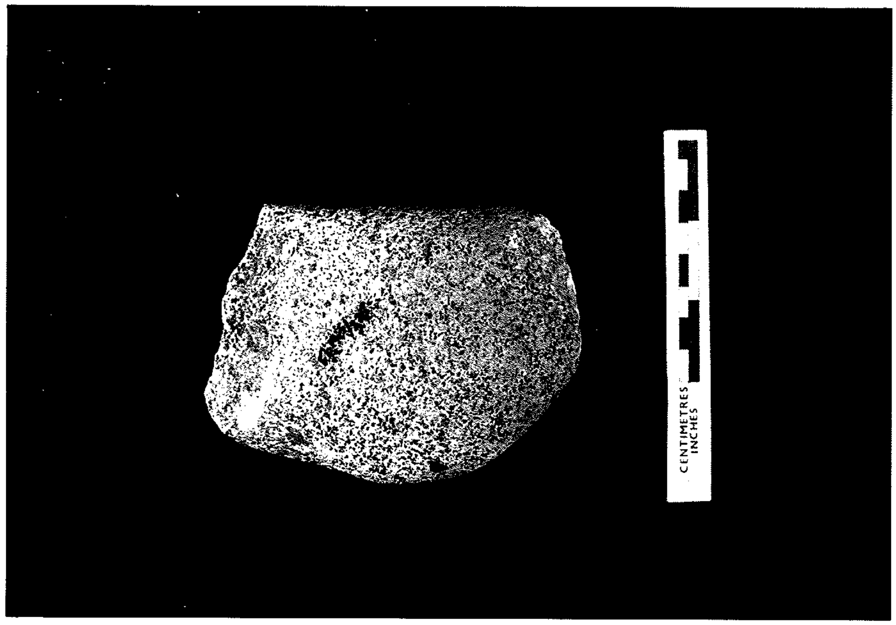
Plate 15. Excavated Maul or Hammerstone

Plate 16. Possible burin-facted blade section (upper left) and two possible gravers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