THE AVERY SITE AT ROCK LAKE:
A PREHISTORIC CAMPSITE IN
SOUTHWESTERN MANITOBA

by

Dennis C. Joyes

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF MASTER OF ARTS

Department of Anthropology

University of Manitoba

Winnipeg, Manitoba

February, 1969

ABSTRACT

The Avery site, in southwestern Manitoba, was first excavated between 1944 and 1948 by Chris Vickers and later, during 1966, by the University of Manitoba.

The artifacts recovered during the 1944-48 and the 1966 excavations were combined, sorted into function classes and subdivided into types according to clusters of attributes shown to have cultural-historical significance at other sites. The Avery material was compared to collections from stratified sites in adjacent regions. This resulted in the identification of artifacts representing at least six archaeological units at the Avery site. These units are thought to represent the major archaeological cultures of southwestern Manitoba during the last 3-4000 years. These are: the McKean-Duncan-Hanna phase (ca. 1500-1000 B.C.); the Pelican Lake phase (ca. 500 B.C.-0 A.D.); The Besant phase (ca. A.D. 300-500); the Avonlea phase (ca. A.D. 400-600); the Manitoba phase (ca. A.D. 900-1600) and the Selkirk phase (ca. A.D. 1350-1750). All of these archaeological units, except the Manitoba and Selkirk phases, are also known from other regions on the northern Plains.

It is predicted that, in the future, local variations in these units will be defined and that regional sequences will increase in complexity.

ACKNOWLEDGEMENTS

I would like to dedicate this thesis to Chris Vickers, who, along with Mrs. Vickers, son Ivan and daughter Betty, conducted the first and most extensive excavations at the Avery site. Chris Vickers also introduced me to a number of important sites and collections, conducted a series of lecture tours both in the field and on film, answered a multitude of questions and most of all, inspired me with his wisdom, wry humor and love for the parklands of Manitoba.

Both we, of the University of Manitoba, and Chris Vickers before us, were freely granted permission to conduct excavations at Rock Lake by Jeff, Elsie, Robert and Evelyn Avery. The Averys were also our warm and generous hosts while we were working at the site.

Many thanks for a job well done to the members of the 1966 field crew: Eugene Gryba, William Morgan, Leo Pettipas, Leigh Syms and our director Morgan Tamplin.

Special thanks are due Dr. William J. Mayer-Oakes for allowing the University of Manitoba's Glacial Lake Agassiz Survey crew to spend a third of the 1966 field session at the Avery site, for providing laboratory space in which to complete a long overdue project and for tolerating the 19,520 bone fragments which filled that space for so many months.

I am obligated to those who expended time and effort assisting in the identification of faunal, floral or lithic specimens. Dr. Ken Stuart and Dr. C. Lindsay, Department of Zoology, University of Manitoba, guided me past some initially perplexing problems in the identification of bones; Dr. E. J. Crossman, Department of Ichthyology and Herpetology, Royal Ontario Museum, identified the fish bones; Dr. Alan Cvancara, Department of Geology, University of North Dakota, identified the invertebrate faunal remains and Dr. Paul Lukens, Department of Biology, Wisconsin State University, assisted in the identification of a number of mammal and bird bones. Dr. E. Perem, Forest Products Laboratory, Ottawa, identified my samples of wood charcoal and Dr. D. Anderson, Department of Geology, University of Manitoba, identified some puzzling lithic materials.

For assistance of many kinds within the field of archeology, I hereby thank, and absolve from any responsibility for what I have said in this manuscript, Dr. Richard G. Forbis, Leslie B. Davis, Brian O. K. Reeves, Wilfred M. Husted, Roscoe Wilmeth, Thomas F. Kehoe, Stuart W. Conner and Gilbert Watson.

Virginia Gerelus, supervisor of the Laboratory of Anthropology at the University of Manitoba during the 1966-67 academic year, helped me find a way through a maze of technical difficulties and ran countless errands which must have, at times, seemed bizarre. Susan Foley's

editorial assistance saved a portion of the manuscript from certain disaster and Lynne Sussman measured, remeasured, counted or otherwise examined nearly every artifact in the collection and a good many of the pages in the manuscript. My thanks also to Donna Morgan and Caroline Maas for their help and advice in creating the illustrations.

Frank Wagner and Stuart Conner spent considerable time photographing the artifacts. Photography in the field was ably handled by Morgan Tamplin and Eugene Gryba.

Chris Vickers' work at the Avery site was supported, in part, by grants from the Historical and Scientific Society of Manitoba while the 1966 field work was carried out as a part of the University of Manitoba's Glacial Lake Agassiz Survey. The latter project is made possible by grants from the National Research Council and the National Museum of Canada and is administered through the Department of Anthropology at the University of Manitoba.

TABLE OF CONTENTS

TABLE OF CONTENTS--Continued

LIST OF TABLES

LIST OF TABLES--Continued

LIST OF FIGURES

LIST OF PLATES

LIST OF PLATES--Continued

INTRODUCTION

Archeological investigation at the Avery site began in the summer of 1944 when Chris Vickers, then of Baldur, Manitoba, followed up a promising test excavation with the completion of a major excavation unit. Vickers continued working at the site for the next four years until the conclusion of the project in 1948. With this work, the Avery site became the first prehistoric occupation site to be extensively excavated in the province of Manitoba.

Events leading to the discovery and excavation of the Avery site actually began ten years earlier, in 1934, when Vickers was appointed assessor of the municipality of Argyle in southwestern Manitoba and later of the adjacent municipality of Strathcona. This position provided opportunities for Vickers to become intimately acquainted with the archeological resources of these localities and he began locating and making collections from a number of sites. Some of the more important sites located were the Lowton, Kreiger, Lukiew-Sutton, Zeb Montroy, Paddock and Snart sites (Vickers 1948b, c, 1949a) and the Sykes, McKay and McLaren Mounds (Vickers 1945).

The Avery site was discovered as a result of Vickers finding artifacts on the northeast shore of Rock Lake; a discovery which prompted him to make a more intensive survey

of the locality. Artifacts and bone fragments were next found on the second terrace level above the lake shore near Avery's Hotel. On the third terrace level, a glade which served as a picnic area also yielded a surface collection of flakes, potsherds and bone fragments. Test excavations, however, were impractical at both of these locations.

Vickers then searched east of the picnic area, still on the third terrace level, and discovered a number of potsherds exposed on a bare patch of ground from which a small barn had recently been moved. This location, somewhat removed from the activities of weekend beachcombers and fishermen, seemed an ideal spot at which to conduct excavations and a test trench was dug in the hope of discovering further evidence of occupation. The results of the test excavation were promising, so promising in fact, that work on a larger scale was begun immediately. By the end of the season, a major excavation unit had been completed with the recovery of several hundred potsherds and lithic artifacts.

Beginning in 1945, Vickers submitted annual summary reports on the work at the Avery site to the Historical and Scientific Society of Manitoba (Vickers 1946a, 1948a, b, c, 1949a) and published elsewhere on aspects of Manitoba archeology relating to the work at the Avery site (Vickers 1945, 1946b, 1948d). MacNeish (1954: 45-7)

incorporated Vickers' observations on the Avery site collection into the comparative portions of the Stott Mound and Village report and Wedel (1961: 159, 236) briefly mentioned the Avery site and located it on his map of the Middle Missouri and Northeastern Periphery regions.

In 1954, Vickers arranged to have the Avery site collection stored in the Winnipeg Law Courts Building. This was accomplished through the courtesy of the provincial government and, partially as a result of the key to the storage room being lost, the collection remained there for the next eight years. In 1962 the Department of Anthropology was established at the University of Manitoba and Vickers was anxious to have his collection placed at the disposal of the new department. After finally extricating his collection from the aegis of government storage, he was able to formally turn it over to the University in December 1962.

During the 1965-66 academic year, I became interested in the collection from the Avery site and carried out a limited project involving the analysis and description of a sample of body sherds from the site. Through this exposure to the collection I became aware of the need for a more extensive report on the Avery site. There were several difficulties in the way of preparing a full site report, however. The first of these was the inadequate information available concerning the stratigraphy of the

site, the second was that Vickers was unable, because of storage problems, to collect an adequately large sample of the faunal remains, and third, I had no first-hand knowledge of either the locality or the site itself.

Satisfaction of the need for additional field work at the Avery site was made possible by Dr. William J. Mayer-Oakes who arranged for the University of Manitoba Glacial Lake Agassiz Survey crew to spend the first four weeks of the 1966 field season at the site. Field work began under the direction of Dr. Mayer-Oakes on June 1, 1966. Morgan Tamplin joined the project on the 21st of June and the work continued through June 30th under his direction.

The analysis of the material recovered in the 1966 excavations, as well as that collected by Vickers, was carried out during 1966, 1967 and 1968 in the Laboratory of Anthropology at the University of Manitoba.

Throughout this report both sets of data, that collected by the University of Manitoba and that collected by Vickers, are combined. Data concerning temporal and spatial distribution are provided for the projectile points and the pottery. These are considered to be the diagnostic artifacts at the Avery site and are the primary data upon which the concluding cultural sequence is based (Chapter XV).

CHAPTER I

THE NATURAL SETTING

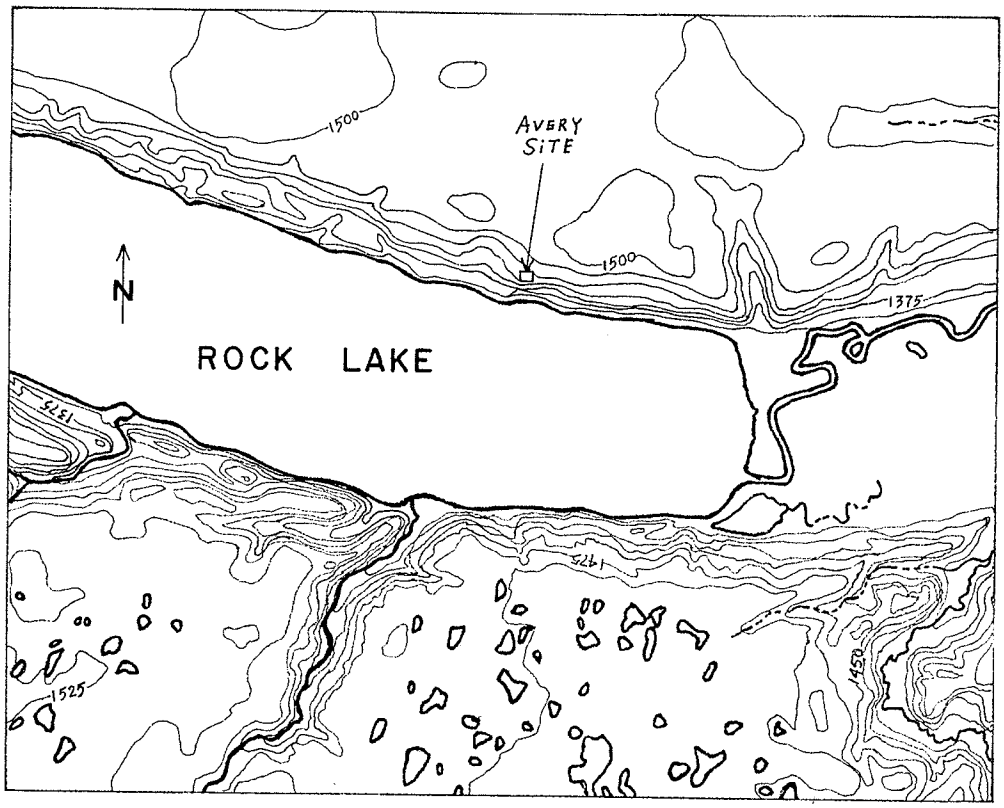
Location

The Avery site (DhLs-1), named for Jeff Avery, owner of the property, is located in the southwest quarter of Section 14, Township 3 North, Range 13 West, on a terrace above the northeastern shore of Rock Lake, about nine miles west of the town of Pilot Mound, Manitoba (Fig. 1). Rock Lake is one of a chain of shallow lakes which occur in the Pembina River Valley, a broad, steep-sided channel which formerly served to drain Glacial Lake Souris but which is now occupied by the Pembina River.

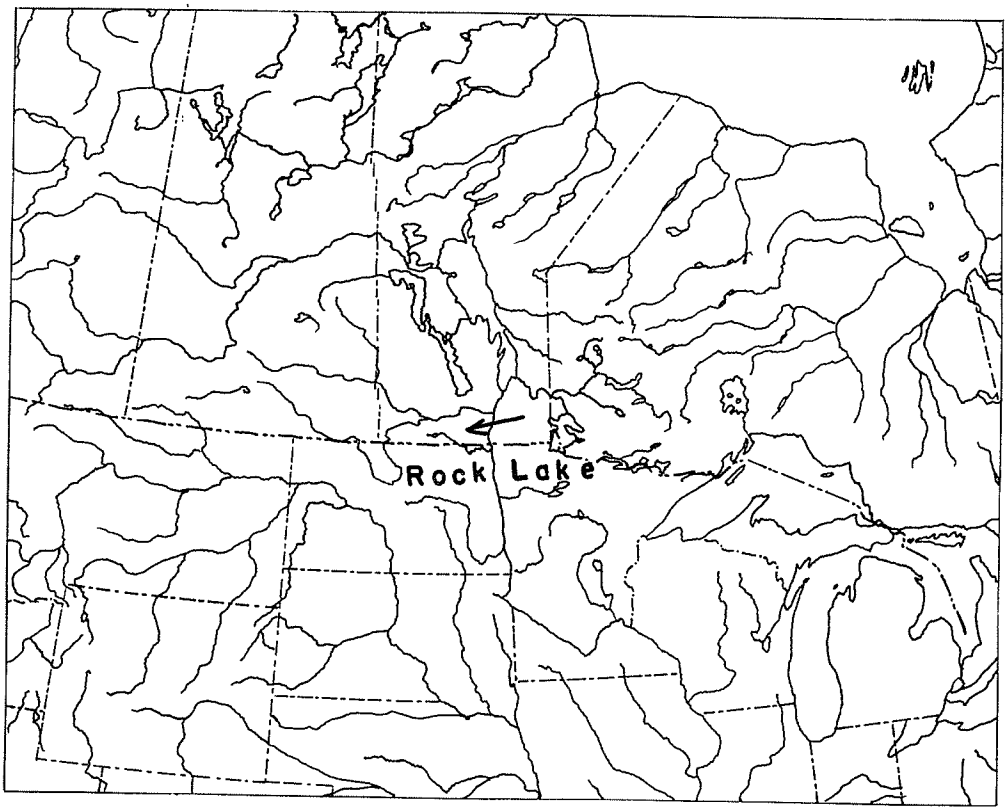
Topography

North of the Pembina River Valley lie the Tiger Hills, an end moraine consisting of hilly uplands dotted with lakes and sloughs. This moraine continues to the east where, with somewhat greater local relief, it becomes known as the Pembina Hills. North, beyond the Tiger and Pembina Hills moraine belt, is a broad area of sandy deltaic deposits laid down when the Assiniboine River emptied into Glacial Lake Agassiz.

West of the Tiger Hills area is the Souris Plain through which the Souris River flows northeastward to join



a



b

Figure 1. Location of the Avery site.

the Assiniboine. The area south of the Pembina and Souris River valleys is a gently undulating outwash plain containing numerous shallow lakes and sloughs. In the center of this area, straddling the International Boundary, the Turtle Mountains rise to 2500 feet, the highest elevation in southwestern Manitoba.

The entire physiographic division described above is a part of Manitoba's western upland or second prairie level. This division is set off from the Manitoba lowland, former bed of Glacial Lake Agassiz, by the southeast to northwest-trending Manitoba escarpment which lies about forty miles east of the Rock Lake locality (Halstead 1959: 3-4).

The Natural Communities

There are three types of natural communities in southwestern Manitoba, the woodlands, the grasslands and the aquatic communities, each of which consist of differing aggregations of plants and animals. The slopes of the Pembina River Valley around Rock Lake, including the immediate vicinity of the Avery site, consist of woodlands while the surrounding area, above the slopes of the Pembina Valley, consists of aspen parkland, that is, grassland interspersed with groves of aspen. The aquatic communities are represented, in the site locality, by Rock Lake and the Pembina River.

Bird (1961: 3-4) has presented evidence to show that in the aspen parkland the ratio of grassland to forest has

has fluctuated over the years according to the presence of ecological factors favoring the spread of one over the other. He says (1961: 3) that "the grassland may advance on the forest when the trees are unable to survive during dry periods and when there are repeated fires, or it may retreat as conditions become more favorable for forest growth."

This observation is supported by Henry Youle Hind's description, in 1858, of vast areas of open grassland west of the Souris River in areas that presently consist of aspen parkland (Bird 1961: 3). In addition, the reports of early homesteaders in the 1890's state that areas between Souris and Birtle, Manitoba, now dotted with aspen groves, were so devoid of forest that the only sources of firewood were in the River Valleys (Bird 1961: 4). A map compiled by Ernest Thomson Seton in 1905 also showed broad areas of grassland north and south of the Pembina River Valley where there is now aspen parkland (Bird 1961: facing 1).

The Woodland Communities

The biotic components of the woodlands in the Rock Lake section of the Pembina Valley include the bur oak (*Quercus macrocarpa*,[1] Manitoba maple (*Acer negundo*), trembling aspen (*Populus tremuloides*), balsam poplar

---

[1]All plant and animal nomenclature follows Bird (1961).

(Populus balsamifera), white birch (Betula papyrifera), American elm (Ulmus americana) and the green ash (Fraxinus pennsylvanica).

A dense shrub strata is present, consisting of hazlenut (Corylus americana), dogwood (Cornus stolonifera) and highbush cranberry (Viburnum opulus). Willows (Salix spp.) occur along the lake shore. Some of the more common herbs include wild sarsaparilla (Aralia nudicaulis), bedstraw (Galium triflorum), wild raspberry (Rubus idaeus) and red baneberry (Actaea rubra).

Along the forest edge, chokecherry (Prunus virginiana), pin cherry (Prunus pensylvanica), hawthorn (Crataegus spp.) and serviceberry (Amelanchier alnifolia) occur in association with rose (Rosa sp.) and snowberry (Symphoricarpos occidentalis).

The plant composition of the parkland groves above the river valleys is somewhat less complex than that described above for the valley slopes around Rock Lake. The dominant plants in the parkland groves are the trembling aspen and snowberry which grow in association with chokecherry, hazlenut and rose.

The snowshoe hare (Lepus americanus) is the dominant animal in the woodlands. Its major predators are the Great Horned Owl (Bubo virginianus) and the coyote (Canis latrans). The bobcat (Lynx rufus) was once common and also depended largely upon the snowshoe hare. Formerly the mule

deer (Odocoileus hemionus) was abundant, especially in hilly areas, but by the turn of the century was largely replaced by the whitetail deer (Odocoileus virginianus) which adapted more readily to conditions brought about by settlement (Bird 1930: 401).

The black bear (Ursus americanus) was once present but has been forced to retreat with increasing settlement, and the grizzly bear (Ursus horribilis), recorded by the younger Henry (Coues 1897: 121, 221, 259, 281) in southern Manitoba at the beginning of the 19th century, has long since disappeared. The mountain lion (Felis concolor) has occasionally been recorded in the parkland (Bird 1961: 67).

Both the elk and bison, formerly abundant in the grassland community, entered the woodlands for shelter. Bison especially, used trees for rubbing posts and in the process destroyed considerable areas of shrub growth. The younger Henry (Coues 1897: 119), who observed bison along the Red River in the early 19th century, described forest groves which had been completely denuded of vegetation save for the larger trees.

Common smaller mammals of the forest edge are the red squirrel (Tamiasciurus hudsonicus), least chipmunk (Eutamias minimus), Franklin ground squirrel (Citellus franklinii) and the striped skunk (Mephitis mephitis). The beaver (Castor canadensis), although greatly reduced from its former numbers, is still an influent in the woodlands

adjoining lakes and streams.

Numerous species of birds occur in the woodlands as summer residents and, in the spring and fall, flocks of juncos, sparrows and warblers pass through during migration. The Passenger Pigeon (Ectopistes migratorius) was extremely abundant in Manitoba until about 1880 but today is extinct. Important birds of prey in the parklands are the Great Horned Owl, the Goshawk (Accipiter gentilis) and Cooper's Hawk (Accipiter cooperi). The forest bird most likely to have figured directly and to any extent in an aboriginal economy was the Ruffed Grouse (Bonasa umbellus).

The Grassland Community

The grassland community consists of a number of plant associations which vary in species composition from locality to locality according to the types of soil present and the availability of moisture. The most common species of grass are wheatgrass (Agropyron spp.), Fescue (Festuca spp.), bluegrass (Poa spp.) and needlegrass (Stipa spp.). Sedge (Carex sp.) is common in moist areas and a variety of forbs are abundant including the Indian turnip (Psoralea esculenta). The snowberry is the most common grassland shrub.

The once dominant mammal on the grassland was the bison (Bison bison) which was found throughout the southern portions of Manitoba and which, in both bulk and numbers,

provided the single most important animal resource for the prehistoric hunters. The elk (Cervis canadensis), often mentioned as being abundant by early visitors to the region (Henry 1901: 304; Coues 1897: 224), grazed the grasslands but depended upon the forest groves for the shelter of its young (Bird 1930: 400). The pronghorned antelope (Antilocapra americana), although essentially a short grass species, is nevertheless well documented as having occured in the parkland (Seton 1909: 214-16).

The grey wolf (Canis lupus) and the swift fox (Vulpes velox) have both disappeared from the grasslands since settlement, however, the coyote and the red fox (Vulpes fulva) have survived as predators of small mammals such as the jackrabbit (Lepus townsendii), the thirteen-lined ground squirrel (Citellus tridecemlineatus), the Richardson ground squirrel (Citellus richardsonii) and the pocket gopher (Thomomys talpoides). The badger (Taxidea taxus) depends primarily upon ground squirrels and other small mammals.

About nine species of birds nest on the grassland and several other species stop over during migration. The largest permanent resident is the Sharptailed Grouse (Pediocetes phasianellus). Various hawks and owls hunt on the grassland for small rodents.

The Aquatic Communities

The aquatic communities of the parkland can be classified into three types according to the nature of the bodies of water involved. The three types of aquatic communities are: (1) sloughs, which are small, shallow ponds formed by meltwater in the spring; (2) lakes, which are larger, more permanent bodies of water having firm bottoms and (3) rivers.

Sloughs are most common in the hilly, morainic uplands where drainage is poorly developed. Characteristic vegetation is an offshore growth of bulrushes (*Scirpus* spp.) and cattails (*Typha latifolia*) with the deeper areas frequently choked with several species of pondweeds (*Potamogeton* spp.). The non-alkaline sloughs are surrounded by willows.

The dominant slough mammal is the muskrat (*Ondatra zibethica*) which subsists largely upon aquatic vegetation. The moose (*Alces americana*), although now much restricted in distribution, formerly could be found in swampy areas where willow and dogwood were present.

The sloughs support a large and varied resident population of birds. The Red-winged Blackbird (*Agelaius phoeniceus*), which nests along the edges of sloughs is, according to Bird (1961: 20), probably the single most abundant avian species in the parkland. A dozen species of ducks occur in large numbers as residents and several

others appear as regular migrants. The Canada Goose (Branta canadensis) nests around the sloughs and at least three other species of geese are common during the spring and fall migrations. In the past, the Whooping Crane (Grus americana) and the Trumpeter Swan (Olor buccinator) nested near the sloughs. The Sandhill Crane (Grus canadensis) and shorebirds such as the Killdeer (Charadrius vociferus) and Willet (Catoprophorus semipalmatus) remain abundant.

Lakes differ from sloughs in being larger and more permanent due to their being fed by springs and streams and in having generally firm bottoms composed of sand or gravel. Lakes with large areas of water over fourteen feet in depth, such as Rock Lake, contain fish. Three species of minnows commonly occur and the most abundant species of game fish are the northern pike (Esox lucius) and the white sucker (Catostomus commersoni).

Several fish-eating species of birds are found associated with the lake communities. Principal among them are the Loon (Gavia immer), the White Pelican (Pelecaus ezythrorhynchos), the Double Breasted Cormorant (Phalacrocorax auritus) and the Great Blue Heron (Ardea herodias).

Several species which are characteristic of a riverine environment occur at Rock Lake since it is part of

the Pembina River system. These include the beaver, muskrat, mink (Mustela vison) and racoon (Procyon lotor). A characteristic riverine bird is the Belted Kingfisher (Megacyrle alcyon). Several species of mollusca are present and crayfish (Cambarus spp.) are bottom scavangers which form an important element in the diet of fish, mink, racoons and kingfishers.

The invertebrate population numbers into the millions in all of the communities described above and provides an essential link in the food chain of many species. The only insects likely to have directly affected man to any extent were the mosquitoes, of which seven species occur in incalculable numbers, particularly around sloughs.

Climate

The humid continental climate of southern Manitoba is characterized by cold winters, and summers which range from warm in the south to cool in the north. The mean winter temperature from November to March is 6° F and the mean January temperature is about -3° F. The average summer temperature from May to September is 58° F and the mean for the warmest month in the southernmost part of the province is about 65° F. At the Brandon, Manitoba meteorological station the mean January and July temperatures over a thirty-six year period were -3° F and 65° F respectively (Kendrew and Currie 1955: 190).

The mean annual precipitation at the Brandon station over a thirty-six year period was 15.7 inches with a seasonal concentration in the summer months. Winds are prevalent the year around, particularly in the spring. There is an average of 96 frost-free days per year. The average annual wind speed at Winnipeg is 10 miles per hour, however, speeds have been recorded up to 56 miles per hour with gusts in thunderstorms occasionally approaching 100 miles per hour (Winnipeg International Airport Weather Information, 1967).

CHAPTER II

THE SITE AND THE EXCAVATIONS

The Site

The Avery site proper, where excavations were conducted by Chris Vickers, and later by the University of Manitoba, is situated on the third of four terraces above the northeastern shore of Rock Lake at an elevation of about 129 feet above the lake level. The 1450 foot contour line follows the third terrace level in the locality of the site (Fig. 1 a).

The site location is level to the east and west along the terrace except for a small depression cut by a weak but still active stream which flows past the western edge of the site. Farther to the west, and to the east, deep ravines have been cut through the terraces by still active streams which have their sources on the fourth terrace and drain into Rock Lake. The site is bounded on the south by the edge of the third terrace, below which an approximately 32° slope leads down to the second terrace level where Avery's Hotel is located. To the north, the topography begins to slope gently uphill for about 100 meters where an abrupt rise leads up to the fourth terrace level and out of the Pembina River Valley to the level prairie above.

Evidence of prehistoric occupation in the locality extends considerably beyond the station at which the excavations were conducted. Tests along the road leading down the valley slopes to Avery's Hotel, some 110 meters west of the datum for the 1966 excavations, indicated a heavy concentration of artifacts and bone fragments. Farther west, about one-fourth mile west of the 1966 datum but on the second terrace level, MacNeish and Capes (1958) conducted excavations at the United Church site. Flakes and bone fragments can be found on the surface for at least another one-fourth mile west of the United Church site, as far as Levi's Motel, a total of one-half mile west of the Avery site proper.

To the north, evidence of aboriginal occupation extends to the slopes of the fourth terrace, about 120 meters north of the Avery site. The most easterly evidence of occupation occurs along a roadcut near a playground on the first terrace level, one-fourth mile east of the Avery site. To the south, artifacts and bone fragments can be found on both the second and first terrace levels, from the Avery site proper to the lake shore, a horizontal distance of about 150 meters. Although it was impossible to determine whether evidence of prehistoric occupation occurred continuously over the larger area it is obvious that there was intensive occupation over a considerable area extending

for three-fourths of a mile east and west along the valley slopes and from the upper slopes of the Pembina Valley to the shore of Rock Lake. Both the Avery and United Church sites lie within this area.

The Excavations

Vickers selected the location at which he began his excavations, first, because it appeared to be an area of concentrated prehistoric occupation, and second, because, the locality is a resort area there were a limited number of places where extensive excavations were feasible. Since the objectives of the University of Manitoba crew were largely to attempt to corroborate the data collected by Vickers, our excavations were located adjacent to his.

Vickers' most extensive excavation project, known as Excavation 1, (Fig. 2) was begun on the third terrace level in an area about 140 meters east of the road leading down the valley slopes to Avery's Hotel located downslope from the north edge of Fig. 2. This was the area in which Vickers first discovered a number of sherds exposed on the surface and where he first placed a test pit. About 40 meters east of Excavation 1, on the west side of the small stream which flows past the site, Vickers carried out a second dig designated as Excavation 2. A short distance north of Excavation 1, a third location, known as Excavation 3, was also tested. Excavation 1 was the largest

and most productive of the three excavation projects while Excavation 3 was the most limited in extent and the least productive.

The first endeavor, when the University of Manitoba crew arrived at the site in 1966, was to clear the extremely heavy underbrush (Plate 1). This being done, a series of depressions became evident which roughly outlined the partially refilled trenches of Vickers' former Excavation 1, although the exact edges of the old excavation units were much too nebulous to detect.

About 30 meters west-northwest of the northwest edge of Vickers' old Excavation 1, the base of a tree was marked as a datum and a base line was staked running 60 meters due east from the datum point (Fig. 2). At 26 meters east of the datum, a line was staked from the base line to a point 16 meters south of the line. Along this north-south line, which extended along the western edge of Vickers' Excavation 1, three 2-meter excavation units were staked, one 2 meters south of the base line, and the others 10 and 16 meters south of the line. Each square was designated by the number of the stake in its southwest corner.

Forty-eight meters east of the datum point, two adjacent squares were staked, one 10 meters south of the base line and the other 12 meters south of the line. Both of these units were situated alongside the east edge of Vickers' former Excavation 1. A north-south trench, passing

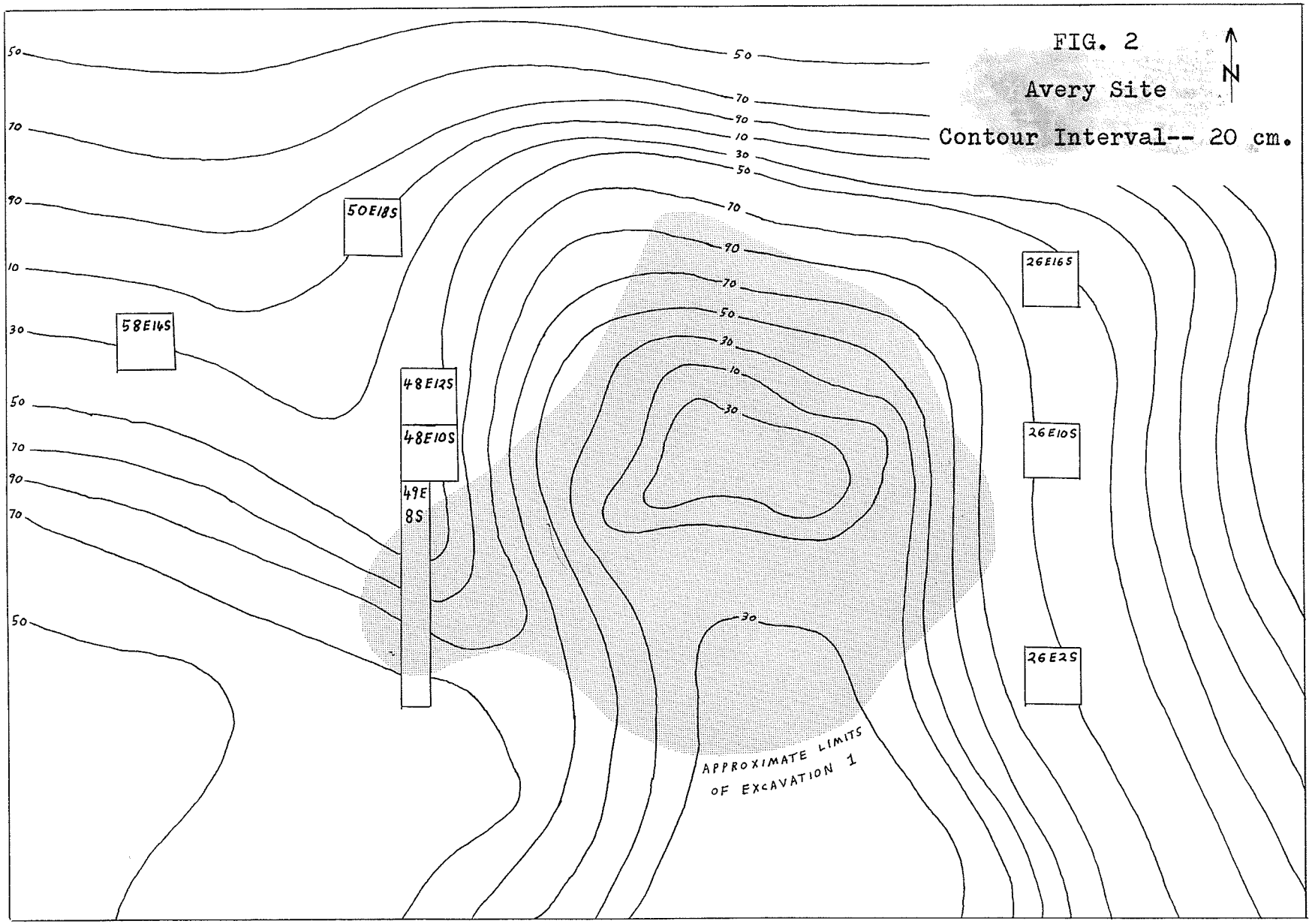


FIG. 2

Avery Site

Contour Interval-- 20 cm.

through a portion of old Excavation 1, later connected these units to the base line. Another excavation unit was located 50 meters east of the datum and 18 meters south of the line and the easternmost unit was situated 58 meters east and 14 meters south of the datum point. This made a total of seven 2-meter squares and one 1 by 8 meter trench or 36 square meters excavated at the site in 1966.

Since there was no evidence of stratigraphy at the site, other than the natural A and B soil horizons, the excavations were conducted using arbitrary 5 centimeter vertical control units. The squares were excavated to an average depth of 42 centimeters except for the northeast 1 meter of unit 58E14S which was excavated to a depth of 1.70 meters. Trowels were used throughout and the soil was sifted through screens of one-quarter inch mesh. Root cutters and small hand saws were essential tools since the soil was heavily interspersed with roots in all areas of the site. Artifacts were placed into sacks marked according to the unit and level in which they were found. All material, excepting some of the bone, was washed and catalogued in the field.

Soils and Stratigraphy

The soils comprising the slopes of the Pembina Valley are complex and difficult to classify since they have developed under a variety of microenvironmental conditions

including slope wash and locally differing patterns of erosion. The predominant soil type in the wooded portions of the valley is Pembina clay loam (Ellis and Shafer 1943: 64-5) although the soil at the site location has a higher humus content than is usual for woodland soils, probably as a result of cultural activities.

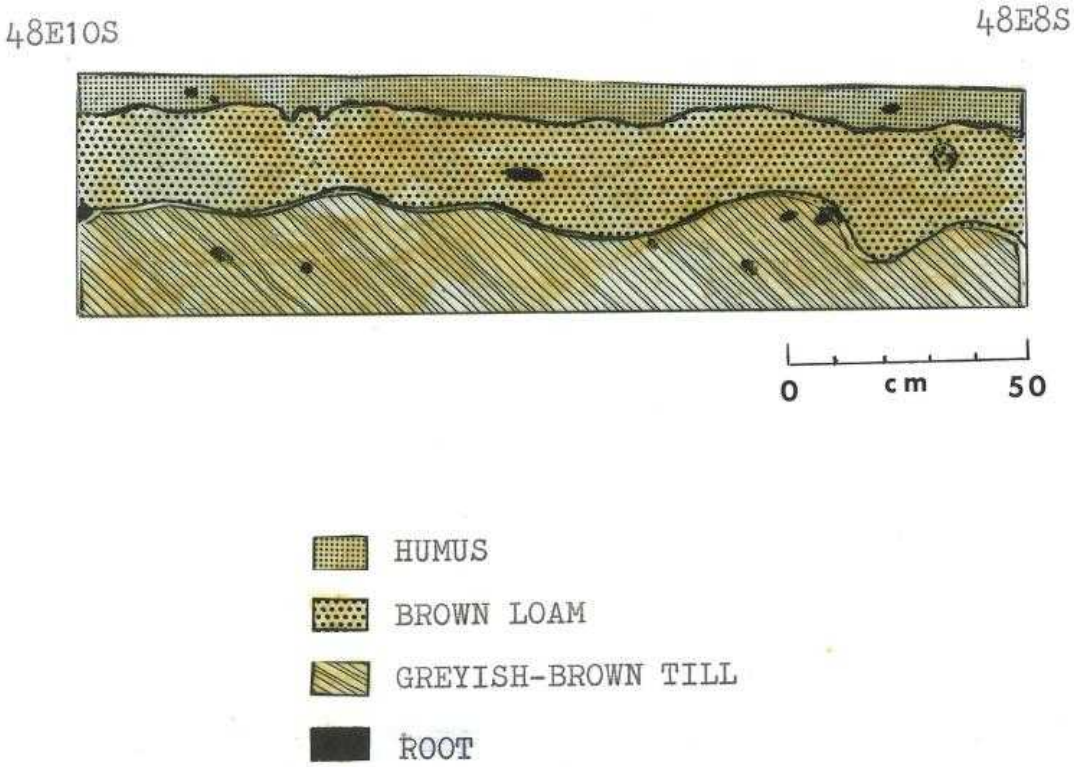
The soil profile at the site revealed an A horizon of friable, sandy loam ranging in color from very dark grey (Munsell 10YR 3/1 dry) to dark brown (10YR 3/3 dry). The depth of this horizon ranged from a mere 6 centimeters at the southwestern edge of the site (unit 26E16S) to a maximum of 48 centimeters in the central area of the site. The average depth of the A horizon was about 24 centimeters. This horizon was characterized, in all areas of the site, by up to 10 centimeters of humus consisting of a layer of undecomposed (Aoo horizon) and partially decomposed (Ao horizon) leaves, grass and other organic debris.

The B horizon, which contrasted quite sharply with the topsoil above, consisted of a greyish brown (Munsell 10YR 5/2 dry) calcareous boulder till which probably originated from the slopes above and was redeposited sometime during the geological history of the Pembina Valley (Fig. 3, Plate 2 a-b).

On the surface of the site and in the partially decomposed leaf mold, wire, broken glass and bottle caps were found which date from sometime since about 1900 when

FIGURE 3

UNIT 48E10S WEST WALL



the locality was first permanently settled by Whites. Also beginning in the upper portions of the A horizon were bone fragments, lithic artifacts and potsherds. The occurrence of prehistoric cultural material continued to an average depth of about 25 centimeters with a notable lack of artifact concentrations either vertically or horizontally within the deposit.

No evidence of stratification within the artifact-bearing A horizon could be detected either in the soils of the site or in the distribution of artifacts. Vickers, however, (1948a: 6-7) reported that certain artifact types, such as Blackduck pottery, occurred stratigraphically above others, such as Laurel ceramics, and on this basis separated the Avery assemblage into two major components. Avery 1, the most recent, was assigned to the Manitoba Focus of the Headwaters Lakes Aspect (Blackduck) and Avery 2 was assigned to the Rainy River Aspect (Laurel).

Although it is apparent that some vertical separation of materials did exist in the more heavily occupied portions of the site, the occupational history of the site is also considerably more complex than originally suspected and the data necessary to plot meaningful frequency distributions of the diagnostic artifacts are not available. Attempts to plot culturally significant frequency distributions for the artifacts recovered in the 1966 excavations proved fruitless because too few diagnostic artifacts were found

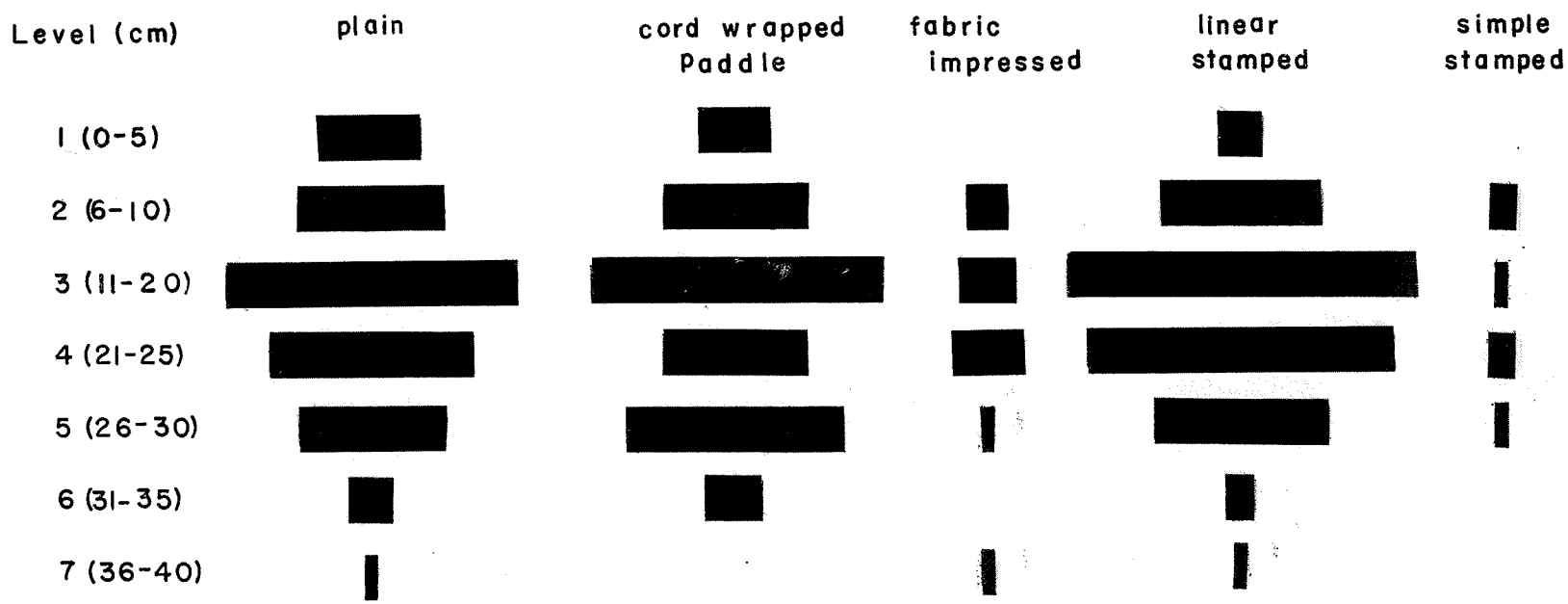
and no stratigraphic trends could be discovered (See, for example, Table 1).

The reasons for the apparent lack of cultural stratification in the deposits are the result of both cultural and geological factors. Most significant is the fact that the site is located on a high terrace which has not been subjected to alluvial deposition since early post-glacial times and that the slopes above this terrace are too gradual for slope wash to have occured in the recent geological past. This means that the soils of the higher terraces have been evolving slowly through a process of accumulation and weathering without major hydrological interruption for a considerable period of time.

In addition to these geological conditions the human occupation of the site has apparently been fairly continuous over the last 2-3000 years and has probably coincided with the physical development of the topsoil because the distribution of cultural material corresponded very closely with the A horizon of dark, sandy loam and there was very little cultural material in the calcareous till of the B horizon. Perhaps the occupations of the site were too closely spaced in time for the debris left by one group to be deeply covered before the next group arrived. With the camp debris of a preceding group still near the surface the activities of the next group would undoubtedly result in mixing the material. A large number of old rodent

TABLE I

Frequency Distribution of Body Sherds



burrows encountered in the excavations indicated that burrowing activity also contributed to mixing the deposits.

Cultural material was most abundant in levels 2 to 4 (6 to 20 centimeters) and tapered off sharply in the lower levels and near the surface (see, for example, Table 1). This regular pattern of artifact occurrence has probably resulted from trampling cultural material into the upper few centimeters of the B horizon, a period of maximum deposition of cultural material and finally the accumulation of soil over the top of the greatest concentration of cultural debris.

CHAPTER III

THE FEATURES

Vickers (personal communication, 1967) reported finding four hearths surrounded by rocks and filled with white ash in his Excavation 1. Small amounts of burned bone and charcoal were present in these features and there was a concentration of artifacts in the vicinity of each hearth.

No hearths were encountered by the University of Manitoba crew. Bits of charcoal and fragments of fire-broken rocks were scattered throughout the deposit and occasionally small concentrations of ash or charcoal appeared but nothing was found which indicated either an undisturbed hearth or a distinct occupational stratum.

Other than the hearths reported by Vickers only one other type of feature was encountered. This was the right distal half of a bison radius standing in a vertical position in unit 48E12S and extending from a depth of 5 centimeters to 25 centimeters. It was not possible to determine whether the bone had been thrust into a hole, and was thus intrusive into the upper levels of the site, or whether the upper part of the bone was covered by natural soil deposition. Vickers (personal communication 1967)

reported finding similar features at the site always consisting of a single vertical longbone and with no evidence of any meaningful arrangement.

Kehoe (1967: 33) reports finding similar features at the Boarding School and Rinehardt bison drive sites in northwestern Montana and from the Walter Felt site in Saskatchewan. Gruhn (1965: 4) reports the same phenomena from the Mulbach site in Alberta. The vertical bone features reported from these sites differ from those at the Avery site, however, in that at these sites several bones often occurred together in an upright position and they often formed a pattern, e.g., in parallel lines about 2 meters apart at the Mulbach site and in a row spaced about 4.5 feet apart at the Walter Felt site (Gruhn 1965: 4; Kehoe 1967: 33-4).

CHAPTER IV

LITHIC ANALYSIS

Over ten types of raw materials were used in the manufacture of chipped stone tools at the Avery site (Table 2). This includes the material collected by Vickers as well as that excavated as a part of the 1966 field work. Nearly all of these materials consist of some variety of cryptocrystalline silica. Brown chalcedony, chert, siliceous siltstone and rhyolite constituted 87% of the chipped stone while the remaining 13% included small amounts of crystalline quartz, flint, quartzite, jasper, obsidian and other materials.

Brown Chalcedony ("Knife River Flint")

The most abundant lithic material at the site was that variety of brown chalcedony commonly referred to as "Knife River Flint". Fifty-six per cent of all the chipped stone consisted of this material. "Knife River Flint" is a deep brown, translucent chalcedony which exhibits well developed conchoidal fractures and bulbar scars. Traditionally, the source of this material has been thought to be the aboriginal quarries in the White River formation along the Knife River in southwestern North Dakota although nearly

identical material has been found in the Yellowstone River drainage area of Montana (Ken Feyhl, personal communication, 1967). In Manitoba, small amounts of similar material, but of a somewhat poorer grade, have been reported from the gravels of the Souris River (Hlady 1965). The source of the brown chalcedony used at the Avery site is, unfortunately, a problem which cannot be resolved at present. The material, however, is of consistently high quality and may well have originated from a single source. In order to emphasize the distinctiveness of this material the term "Knife River Flint" will be used throughout this report in referring to the material described above.

Chert

Chert was second in abundance at the site, comprising 25.5% of the chipped stone. This is an opaque, coarse material which varies from white to charcoal grey or red, often within the same nodule. White and pink are perhaps the most frequently occurring colors. Much of the material within a nodule is dotted with tiny crystal-lined cavities which often reduces the chipping quality of the material. The quality of fracture which can be executed on the material varies from an uncontrollable splintering in the coarser material to fairly long but shallow conchoidal fractures in the better material. The varying quality of the material within a nodule makes it necessary to strike

a large number of waste flakes from a nodule before an area of suitable material is encountered. Chert occurs in irregularly shaped nodules, having pitted, variegated cortices, in the glacial till from Manitoba across southern Saskatchewan and in northern North Dakota and Montana. In Manitoba this material is particularly abundant in the Swan River Valley where it is known as "Swan River Chert" (Tamplin 1966: 17).

Siliceous Siltstone

Slightly over 3% of the chipped stone consisted of siliceous siltstone or metamorphosed shale. This material is most commonly grey in color and opaque with a dull luster. Lamination, revealing the sedimentary origin of the material, is often distinguishable although it is sufficiently metamorphosed to flake in shallow conchoidal fractures. A pungent clay odor is given off when the siltstone is dampened. This material occurs consistently, although generally in small amounts, in a broad area over the northern Plains region. Local sources for the material have not been determined in southern Manitoba although Wettlaufer (Wettlaufer and Mayer-Oakes 1960: 70) observed siltstone above burned out coal seams in the locality of the Long Creek site and Davis (1966: 109) reports occurrences in outcrops of the Kootenai formation in the Little Rocky Mountains.

TABLE 2

LITHIC MATERIALS FOUND AT THE AVERY SITE

Material	No. of Specimens	%
Brown Chalcedony	793	56.2
Chert	359	25.5
Siliceous siltstone	45	3.1
Rhyolite	35	2.5
Quartzite	13	.9
Jasper	8	.6
Obsidian	2	.2
Miscellaneous	157	11.1
Totals	1412	100.0

Rhyolite

A fine grained, reddish-brown rhyolite comprised 2.5% of the chipped stone material. Rhyolite is opaque with a dull luster and has a shallow conchoidal fracture. Under a glass, irregular quartz phenocrysts set in a very fine ground mass can be identified. Rhyolite occurs in small amounts in the glacial till throughout southern Manitoba.

Other Lithic Materials

The remaining 12.7% of the chipped stone material consisted of small amounts of crystalline quartz, flint, quartzite, jasper, basalt and obsidian. The source of the obsidian is unknown. Obsidian is extremely rare in Manitoba and its presence at the Avery site may indicate trade or contact with a distant source such as Yellowstone National Park. The other materials are probably all of local origin.

The smooth, waxy luster of many of the lithic materials, particularly "Knife River Flint" and chert, suggests that some of the materials may have been fired or "heat treated" before being worked. Smooth, waxy luster is characteristic of heat treated stone (Crabtree and Butler 1964).

The materials used in the manufacture of the heavy stone tools (Chapter VIII) consisted mostly of granite,

basalt and quartzite, all of which occur locally. Other minerals present at the Avery site include hematite, mica and a pipe fragment of catlinite (Chapter XI). Some of these materials, particularly catlinite, may not occur locally.

CHAPTER V

PROJECTILE POINTS

Excavations by Vickers and by the University of Manitoba produced a total of 212 projectile points. These were classified into six major types representing a time span of approximately 3000 years. The projectile points were compared to samples from stratified sites in southeastern Manitoba (MacNeish 1858), northern Ontario (Wright 1967) and the northwestern Plains (Wettlaufer 1955; Wettlaufer and Mayer-Oakes 1960; Mulloy 1958). Although general similarities were found with the projectile points from the eastern sites it was the sites on the northwestern Plains which consistently provided typological and temporal units within which the Avery site projectile points could be placed.

Classification of the projectile points was accomplished by sorting the sample into homogeneous groups according to clusters of attributes shown to have cultural-historical significance for specimens from other sites. These attributes are described for each type under the appropriate heading.

The metrical analysis of the projectile points follows

the system developed by Forbis (1962: 85-94) and Davis (1966: 110). Nine measurements were attempted on each projectile point using calipers, millimeter ruled graph paper and a scale weighing in grams (Fig. 4). Measurements were taken to the tenth of a millimeter and, in the case of weight, to the tenth of a gram. In addition to the direct measurements, the length/width and width/thickness ratios were calculated for each type.

The only measurement showing a minus reading is that of basal form. Projectile points with a straight base were given a basal form measurement of 0 while those with convex bases were given a positive reading according to the length the base extended beyond 0 (straight). Likewise, points with a concave base were assigned a negative reading, such as -1.5 mm., according to the depth of the concavity.

The base/body index and the height of basal edge/notch width index (HBE/NW) were also calculated for the Late Side-notched projectile points. The base/body index is determined by dividing the width of the body by the width of the base and multiplying by 100. An index less than 100 indicates that the width of the base is greater than the body whereas a reading over 100 indicates that the base is narrower than the body. The HBE/NW index is determined by dividing the height of the basal edge by the notch width and multiplying by 100. A figure greater than 100 indicates

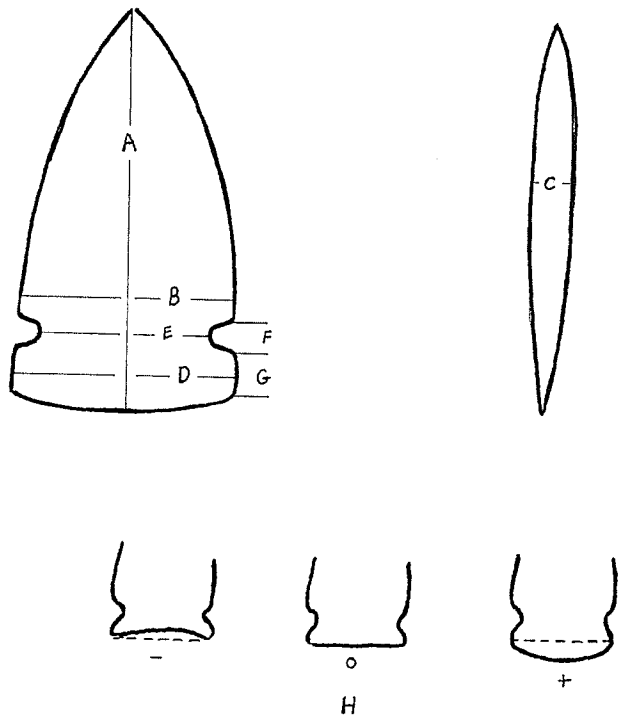


Figure 4. Measurements Taken on Projectile Points. a, length; b, body width; c, thickness; d, basal width; e, neck width; f, notch width; g, basal edge; h, basal form.

a basal edge less than the width of the notches.

The measurements for each projectile point type are summarized in Tables 3 through 10 which give the measurements taken and the range and mean. All measurements could not, of course, be taken on every point since many were incomplete nor were all the measurements applicable to each of the projectile point types. The notch width or height of basal edge were not applicable, for example, to the Duncan type since these attributes are not present on Duncan points. Incomplete points were not weighed.

Projectile Point Classification

Type 1: Duncan Points (Plate 3 a, b)

Sample: 5

Discrete Attributes: According to Wheeler (1954: 7) Duncan points are "characterized by a straight converging or bilaterally convex blade; insloping non-barbed shoulders; and a straight parallel-sided or slightly expanding stem with a shallowly notched base". The Avery specimens closely match Wheeler's (1954: 7) description. The flake scars are broad and deep, extending to, or across, the mid-point of the body. Grinding is present on the base and lateral edges of all the specimens. Four of the points are made of Knife River flint and 1 of siliceous siltstone.

Metrical Attributes: See Table 3.

TABLE 3

DUNCAN POINT METRICAL ANALYSIS

Dimension	N	Range	$\bar{X}$
Length (mm)	4	30.5 - 46.9	36.4
Body Width (mm)	4	19.0 - 20.8	19.2
Thickness (mm)	5	5.0 - 7.9	6.4
Base Width (mm)	5	14.5 - 21.1	18.3
Neck Width (mm)	5	13.0 - 18.4	16.1
Basal Form (mm)	5	-1.0 -(-)3.0	-1.9
Weight (gm)	4	4.0 - 8.4	5.5
Length/Width	4	1.5 - 2.3	1.8
Width/Thickness	4	2.6 - 3.8	3.3

Temporal and Spatial Distribution: Duncan points were found at the Lake Shore site, located on the first terrace level at Rock Lake, directly below the Avery site (Vickers 1949a). No date has been determined for this component, however, Vickers (1949a: 11) recognized it as the earliest archeological unit in the locality. MacNeish and Capes (1958: 120) reported McKean lanceolate points from the United Church site, one-fourth mile west of the Avery site although none were classified as Duncan points. In Saskatchewan, Duncan points were found in the earliest layer of the Mortlach site dated at 1445 B.C. ± 200 (Wettlaufer 1955: 71).

Over a broader geographical area Duncan points have been reported from the McKean site in Wyoming in a layer dated at earlier than 1333 B.C. ± 600 (Mulloy 1954: 446, 456) and from Levels II and III of Birdshead Cave, Wyoming (Bliss 1950), Hells Midden, Colorado (Lister 1951) and the Red Lodge, Lewis and Pictograph Cave sites in Montana (Mulloy 1943, 1958; Mulloy and Lewis 1943).

Type 2: Hanna Points (Plate 3 c, d)

Sample: 3 (Three Hanna points were observed in the Vickers collection when first examined. Later, however, when the points were being measured, only two could be found.)

Discrete Attributes: In form, Hanna points have

straight to slightly convex blades and broad, shallow corner notches which create an incipient tang or barb on the shoulders. The bases are concave (Wheeler 1954). Flake scars extend across the points, beyond the mid-point of the body, and several broad flakes have been removed from the base in an attempt to thin the specimens. Basal grinding is not present. Two points are made of "Knife River Flint" and 1 of chert.

Metrical Attributes: See Table 4.

Temporal and Spatial Distribution: MacNeish and Capes (1958: 122) report finding Hanna points in levels 1, 2 and 5 of the United Church site. At the Long Creek site in Saskatchewan a single Hanna point, closely resembling the Avery specimens, was found in Layer 5 dated at 1413 B.C. ± 115 and 1188 B.C. ± 170 (Wettlaufer and Mayer-Oakes 1960: 48, 109). Hanna points have also been found at Signal Butte I in Nebraska associated with McKean and Duncan points. Dates for the Signal Butte component range from 891 B.C. ± 350 to 2496 B.C. ± 220 (Olson and Broecker 1959: 22). The former date is probably in error and an accurate average is probably about 2000 B.C. The Gant site in South Dakota, another Hanna component, is dated at 2180 B.C. ± 130 (Hurt 1960).

Type 3: Pelican Lake Points (Plate 4 a-k)

Sample: 14

TABLE 4

HANNA POINT METRICAL ANALYSIS

Dimension	N	Range	$\bar{X}$
Length (mm)	1	39.0 -	--
Body Width (mm)	2	20.9 - 22.0	21.5
Thickness (mm)	2	5.8 - 5.9	5.85
Base Width (mm)	1	17.0 -	--
Neck Width (mm)	2	14.8 - 16.3	15.5
Notch Width (mm)	2	7.2 - 9.0	8.1
Basal Form (mm)	1	-3.1 -	--
Weight (gm)	2	3.1 - 4.4	3.8
Length/Width	1	1.8 -	--
Width/Thickness	2	3.6 - 4.2	3.9

Discrete Attributes: These specimens are triangular in outline with deep corner notches and barbed shoulders. The blades are convex to slightly concave and the bases are most commonly straight. In cross-section they range from biconvex to plano-convex to plano-triangular. The quality of the flaking is less striking on the Avery specimens than is usual on Pelican Lake points. Portions of the primary flake scar is often still visible and numerous small ridges and hinge fractures occur. Light basal grinding is present on 23% of the points. Knife River flint was used to manufacture 10 (75.9%) of the points, 2 (15.3%) were made of flint and 1 (7.7%) was made of chert.

Metrical Attributes: See Table 5.

Temporal and Spatial Distribution: The name "Pelican Lake" was first applied to the distinctive, corner-notched projectile points found in Layer 5A of the Mortlach site in Saskatchewan (Wettlaufer 1955: 54). Comparable specimens have been recognized in widely separated localities on the northern Plains and seem to be diagnostic of a phase, or more probably, a series of related phases, dating from about 500 B.C. to A.D. 300.

Besides the Mortlach site in Saskatchewan, Pelican Lake components have been reported from the Long Creek and Walter Felt sites (Wettlaufer and Mayer-Oakes 1960: 44;

TABLE 5

PELICAN LAKE POINT METRICAL ANALYSIS

Dimension	N	Range	$\bar{X}$
Length (mm)	10	16.0 - 37.0	28.4
Body Width (mm)	13	11.0 - 22.0	15.9
Thickness (mm)	13	3.0 - 5.5	4.2
Base Width (mm)	11	10.0 - 19.0	13.0
Neck Width (mm)	13	7.0 - 18.0	10.3
Notch Width (mm)	11	4.0 - 6.0	4.9
Basal Edge (mm)	11	1.0 - 3.0	1.8
Basal Form (mm)	11	-0.9 - 2.0	0.2
Weight (gm)	7	1.1 - 3.0	2.3
Length/Width	10	1.1 - 3.2	1.9
Width/Thickness	12	2.0 - 5.5	4.2

Watson 1966) and the Bracken Cairn may represent a Pelican Lake phase burial (King 1961). Other sites with Pelican Lake components include the Old Woman's Buffalo Jump (Forbis 1962) and the Head-Smashed-In Buffalo Kill (Reeves 1966b: 6) in Alberta and the Keaster, Pictograph Cave, Carter Ferry and Stark-Lewis sites in Montana (Davis and Stallcop 1965; Mulloy 1958; Shumate 1967; Stuart Conner, personal communication, 1967).

In Wyoming, Spring Creek Cave (Frison 1965) and Levels II and III of Wedding of the Waters Cave (Frison 1962) are Pelican Lake components. A date of A.D. 225 ± 200 was determined for Spring Creek Cave and Level 3 of Wedding of the Waters Cave dated at A.D. 342 ± 165 (Frison 1965: 93; 1962: 263).

Larter tanged points from southeastern Manitoba are corner notched and belong to a comparable time period but are much wider and thicker than Pelican Lake points from Saskatchewan (MacNeish 1958: 100-101).

Type 4: Besant Points (Plate 5 a-l)

Sample: 28

Discrete Attributes: In outline, these points have convex blades, straight to concave bases and broad, shallow corner notches which create rounded shoulders and bases only slightly narrower than the body. The flake scars are broad but nearly always extend to or across the mid-point

of the body so as to obliterate the primary flake scar. Basal grinding is present on slightly over 50% of the specimens. Twenty-two (77.5%) of the points are made of "Knife River Flint", 2 (7.5%) were made of quartzite, 2 (7.5%) of chert, 1 (3.5%) of siliceous siltstone and 1 (3.5%) of flint.

Metrical Attributes: See Table 6.

Temporal and Spatial Distribution: The Besant phase or phases, seem to have reached a climax on the northern plains in the fourth and fifth centuries A.D. Besant components include Layers 15-22 at the Old Woman's Buffalo Jump, with a central date of A.D. 310 ± 60 (Forbis 1962: 106-109) and Layers 6 and 8 of the Kenney site, dated at A. D. 490 ± 90 and A. D. 350 ± 115 respectively (Brian Reeves, personal communication, 1967).

Other important Besant components in Alberta include the Head-Smashed-In Buffalo Kill (Reeves 1966b) and the Muhlbach site (Gruhn 1965). In Saskatchewan, Layer 3 of the Long Creek site (Wettlaufer and Mayer-Oakes 1960: 41-42), Occupations 4a to 4d at the Mortlach site, with a date of A.D. 375 ± 325 on Layer 4b (Wettlaufer 1955: 39, 71), and Layer 13 of the Walter Felt site, dated at A.D. 354 ± 70 (Kehoe 1964: 52), are all Besant components.

Davis and Stallcop (1966) present data showing intensive Besant occupation on the north side of the Missouri River and the vicinity of Great Falls, Montana. Farther south,

TABLE 6

BESANT POINT METRICAL ANALYSIS

Dimension	N	Range	$\bar{X}$
Length (mm)	13	23.5 - 64.7	35.0
Body Width (mm)	24	14.0 - 26.5	21.5
Thickness (mm)	26	4.1 - 8.6	5.6
Base Width (mm)	20	15.2 - 23.4	20.0
Neck Width (mm)	25	9.5 - 20.4	15.4
Notch Width (mm)	26	4.0 - 9.0	6.5
Basal Form (mm)	24	-1.0 - 1.2	-1.5
Weight (gm)	12	2.6 - 7.0	4.3
Length/Width	13	1.3 - 2.8	1.7
Width/Thickness	24	2.9 - 5.3	3.8

evidence of Besant occupation is less common, however, the Emigrant Bison Drive north of Yellowstone National Park appears to contain a Besant component (Arthur 1966: 111-13).

In southwestern Manitoba, the Richards Kill site (Hlady 1967) and the Kreiger, Calf Mountain and Lukiew-Sutton sites have yielded impressive collections of Besant points. In southeastern Manitoba, Anderson Corner-notched and Whiteshell Side-notched points found in the Anderson and Nutimik phases resemble Besant points.

Type 5: Avonlea Points (Plate 6 a-y)

Sample: 39

Discrete Attributes: Kehoe and McCorquodale's (1961: 184) description of the Avonlea point can hardly be improved upon and is equally valid for the Avonlea points from the Avery site:

> The most distinguishing feature of the Avonlea point is its delicate aspect, produced by the thinness of the blank struck off for the point. Flaking on the Avonlea points is extraordinarily well-executed, contributing to the delicacy of the projectile point. Flake scars are very broad and shallow, usually parallel, and extending from the edge of the blade to the mid-point or beyond. Tiny lumps and hinge fractures may occur on the poorer minerals employed, but the flake scars as a rule are so shallow and well executed they can hardly be noticed. Even when irregular and conchoidal flaking occurs, it is evident that the workman had excellent over-all control of his method. It is indeed rare to find an Avonlea point on which both faces are less than entirely dressed.

> Small, shallow, but fairly wide side notches are placed extremely low on the blade of Avonlea points. . . . The edges of the triangular blade are very regular, and frequently exhibit fine serration. The base may be wider, equal to, or narrower than the proximal end of the blade; no preference is apparent. Usually, the corners of the base are rounded, rather than sharp, and since the bases are preponderately concave, small ears are typical, projecting at about a 65° angle to the longitudinal axis of the point.

Twenty-two (66.6%) of the Avonlea points from the Avery site are made of "Knife River Flint", 8 (24.2%) are made of chert, 2 (6.1%) are made of siliceous siltstone and 1 (3.1%) is made of white chalcedony.

Metrical Attributes: See Table 7.

Temporal and Spatial Distribution: Components of the Avonlea phase, or phases, are well known from southern Saskatchewan, southern Alberta and northern Montana but have not previously been reported from Manitoba. The Avonlea component at the Gull Lake site in Saskatchewan has been dated from A.D. 210 ± 60 to A.D. 730 ± 80 (Kehoe 1966: 829-30). At the Avonlea type site, also in Saskatchewan, a date of A.D. 460 ± 100 was determined (Kehoe and McCorquodale 1961: 186). Points from the Bighorn Canyon in Montana believed by Kehoe (1966: 830) to represent an Avonlea variant were dated at A.D. 880 ± 70. Davis (1966: 106) in a survey of Avonlea sites on the northern Plains determined obsidian hydration dates for points from three different Avonlea sites in northern Montana. An obsidian

TABLE 7

AVONLEA POINT METRICAL ANALYSIS

Dimension	N	Range	$\bar{X}$
Length (mm)	24	12.4 - 22.0	17.4
Body Width (mm)	28	10.4 - 17.4	13.9
Thickness (mm)	33	1.9 - 3.8	2.7
Base Width (mm)	29	9.4 - 16.2	12.5
Neck Width (mm)	32	7.2 - 14.0	10.3
Notch Width (mm)	33	1.8 - 4.0	2.9
Basal Edge (mm)	33	0.2 - 3.0	1.7
Basal Form (mm)	33	-1.0 - 2.0	-0.05
Weight (gm)	16	0.5 - 1.0	0.7
Length/Width	21	0.9 - 1.7	1.3
Width/Thickness	28	3.4 - 7.8	5.3

point from the Big Badger site yielded a date of A.D. 466 ± 250, two points from the Crawford site both produced a date of A.D. 266 ± 300 and the Timber Ridge site produced points dating A.D. 136 ± 130 and A. D. 786 ± 120. The mean of the Timber Ridge dates is A.D. 456 (Davis 1966: 103-104).

Type 6: Plains Triangular Points (Plate 7 a-l).

Sample: 40

Discrete Attributes: These points are triangular in outline without stems or notches. The blade edges are slightly concave, straight or slightly convex and the bases are either concave or convex. The quality of the flaking is variable. Some of the points have long, shallow flake scars extending over both faces while others are merely retouched flakes. Basal grinding is not present. Three varieties have been determined from from the Avery sample on the basis of blade and base shape:

Variety 1. (Plate 7 a-d)

Sample: 14

This variety is triangular in outline with straight blade edges and bases. Maximum width is at the base. Flaking is well executed with shallow, regular flake scars although portions of the primary flake scar remains on nearly half of the sample. Five of the points are made of "Knife River Flint", 7 of chert and 2 of siliceous siltstone.

Variety 2. (Plate 7 e-h)

Sample: 15

These have convex, lanceolate blade edges and straight bases so that the maximum width occurs above the base. Flaking is well executed except for 5 small specimens that are only laterally retouched. Ten of the points are made of "Knife River Flint", 4 of chert and 1 of rhyolite.

Variety 3. (Plate 7 i-l)

Sample: 11

This variety has straight to convex blade edges with convex bases creating a "teardrop" form. Maximum width occurs at or slightly above the base. The quality of flaking is poor as shown by the large irregular flake scars and uneven blade edges. Six of the points are made of chert, 2 of "Knife River Flint", 2 of rhyolite and 1 of basalt.

Metrical Attributes: See Table 8.

Temporal and Spatial Distribution: A single triangular point occurred in Level 2 of the United Church site (MacNeish and Capes 1958: 125) and comparable specimens were found in Layers 1, 3, 7 and 8 of the Long Creek site associated with Late Side-notched, Besant and Oxbow points (Wettlaufer and Mayer-Oakes 1960: 31, 42, 54, 56-7). At the Mortlach site the associations were also with Late Side-

TABLE 8

PLAINS TRIANGULAR POINT METRICAL ANALYSIS

Dimension	N	Range	$\bar{X}$
Variety 1			
Length (mm)	13	15.5 - 25.0	20.8
Body Width (mm)	12	11.1 - 17.6	15.0
Thickness (mm)	14	2.5 - 4.0	3.4
Basal Form (mm)	13	-0.5 - 0.5	0
Weight (gm)	8	0.5 - 2.4	1.0
Length/Width	11	1.0 - 1.6	1.3
Width/Thickness	12	3.2 - 6.8	4.6
Variety 2			
Length (mm)	12	14.2 - 41.1	24.2
Body Width (mm)	15	11.3 - 23.1	15.0
Thickness (mm)	15	1.9 - 6.6	3.6
Basal Form (mm)	15	0 - 1.0	0.1
Weight (gm)	11	0.5 - 6.0	1.7
Length/Width	12	1.1 - 2.7	1.6
Width/Thickness	15	2.6 - 6.3	3.9

TABLE 8--Continued

Dimension	N	Range	$\bar{X}$
Variety 3			
Length (mm)	11	15.8 - 45.0	24.3
Body Width (mm)	11	11.5 - 23.7	16.2
Thickness (mm)	11	2.0 - 6.9	4.8
Basal Form (mm)	7	1.0 - 3.0	2.2
Weight (gm)	6	0.6 - 4.0	2.9
Length/Width	11	1.3 - 2.2	1.6
Width/Thickness	11	2.6 - 6.6	5.6

notched points and with Besant points (Wettlaufer 1955: 22, 29, 46). In southeastern Manitoba MacNeish (1958: 103) found triangular, unnotched points in components of the Manitoba and Selkirk phases estimated to date from about A.D. 1000.

In Alberta, Plains triangular points appeared in Layers I, II and III of the Ross site, in the Upper and Lower Kill and in the Grassy Lake Cairn, all estimated to date from A.D. 1400-1500 (Forbis 1960: 136-38). Similar points were also found in Layer 4 of the Kenney site, dated at A.D. 1545 ± 60, and at the Head-Smashed-In Buffalo Kill (Reeves 1966a: 30, 77-8).

Plains triangular points may have had a long time span but appear to have been most popular in late prehistoric times. Some triangular points may simply be blanks or unfinished projectile points. This could explain their occurrence during widely separated time periods such as at the Long Creek site. On the other hand, the presence of triangular points at bison kill sites suggest that they were a discrete type, at least during the late prehistoric (Shumate 1950: 4; Forbis 1960: 136-38; Reeves 1966a: 30, 77-8).

Type 7: Late Side-notched Points (Plate 8 a-o)

Sample: 43

Discrete Attributes: The most distinguishing features of the Late Side-notched points are their generally small size and the notches, which are placed on the lateral edges of the points, often well up on the blade. In outline they are generally triangular with straight to convex blade edges and straight to slightly concave bases. The quality of the flaking ranges from mediocre to excellent.

Late Side-notched points are often classified into Prairie and Plains Side-notched types in order to distinguish those with rounded basal edges from those with angular basal edges (MacNeish 1958: 103-104; Kehoe 1966). This is a valid distinction considering that points with rounded basal edges (Prairie Side-notched) tend to cluster somewhat earlier in time than those with angular basal edges (Plains Side-notched), however, this system does not make allowance for the fact that both "types" are closely related and that they also overlap considerably in time. Here, I am regarding both Prairie and Plains Side-notched as a single type, Late Side-notched, within which I have determined seven varieties based largely on data from the Old Woman's Buffalo Jump in Alberta (Forbis 1962).

Variety 1 (Plate 8 a-b)

Sample: 2

This variety is triangular on outline, with straight to slightly concave bases and straight blade edges. The

notches are open and placed high on the edge of the blade so that the height of the basal edge is equal to the width of the notch. One of the most distinctive attributes is the flaring basal edge which results in the base being more than 1 mm. wider than the body. Basal grinding is present on one specimen. One point is made of "Knife River Flint" and the other of siliceous siltstone.

Variety 2. (Plate 8 c-d)

Sample: 2

These points have straight blade edges with straight to slightly concave bases. The notches are placed well up on the blade creating a basal edge greater than the width of the body by about 1 mm. The basal edges are not flaring and basal grinding is not present. Both points are made of chert.

Variety 3. (Plate 8 e-f)

Sample: 6

This variety is characterized by having the width of the base equal to that of the body and in having the height of the basal edge greater than the notch width. The blades are slightly convex and the bases are straight. Four of the 6 points have basal grinding. Four of the points are made of "Knife River Flint" and 2 are made of chert.

Variety 4. (Plate 8 g-h)

Sample: 5

The diagnostic features of this variety are a basal edge equal to, or greater than, the width of the notches and a base narrower than the body by at least 1 mm. The blade edges are straight to slightly convex with bases straight to concave. Basal grinding is present on all but 1 point. Three specimens are made of "Knife River Flint" and 2 are made of chert.

Variety 5. (Plate 8 i-j)

Sample: 18

Variety 5 points have a base at least 1 mm. narrower than the body and a rounded basal edge. Blades are either straight or convex and bases are straight, or rarely, convex or slightly concave. The quality of the flaking is generally mediocre compared to the varieties described above. Eight points are either unifacially flaked or have large areas of the primary flake scar remaining. Fourteen (77.8%) are made of "Knife River Flint", 2 (16.6%) of black flint and 1 (5.6%) of siliceous siltstone.

Variety 6. (Plate 8 k-l).

Sample: 5

This variety is distinguished by having a base equal to, or wider than, the body and a basal edge less than the

width of the notches. The blade edges are straight to convex and the bases are straight to slightly convex. Basal grinding is present on all but one of the specimens. Four are made of "Knife River Flint" and 1 of tan chalcedony.

Variety 7. (Plate 8 m-o)

Sample: 5 points.

These points are actually corner notched rather than side notched. The blade edges are straight to convex, the bases straight to concave and the basal width is at least 1 mm. less than the width of the body. The quality of the flaking is fair but varies with the material. Two are made of "Knife River Flint", 1 is made of tan chalcedony, 1 of rhyolite and 1 of siliceous siltstone.

Metrical Attributes: See Table 9.

Temporal and Spatial Distribution: Late Side-notched points are present in most late prehistoric components on the Plains and also over much of the continent. This type seems to have made its appearance on the northern Plains about A.D. 600-700 (Forbis 1962; Kehoe 1966) and to have lasted into protohistoric times when metal replaced the use of stone for projectile points. It is not known whether the varieties of Late Side-notched points was found at the Old Woman's Buffalo Jump in Alberta had the same life-spans or indicate close cultural relationships to those in Manitoba, however, for the present it can only be assumed that there are some correspondences between the two areas.

TABLE 9

LATE SIDE-NOTCHED POINT METRICAL ANALYSIS

Dimension	N	Range	$\bar{X}$
Variety 1			
Length (mm)	1	23.5 -	--
Body Width (mm)	2	15.2 - 15.5	15.3
Thickness (mm)	2	3.1 - 3.9	3.5
Base Width (mm)	2	16.6 - 17.9	17.6
Neck Width (mm)	2	12.0 - 12.8	12.4
Notch Width (mm)	2	3.2 - 4.0	3.6
Basal Edge (mm)	2	3.0 - 4.2	3.6
Basal Form (mm)	2	-0.9 - 0	0.4
Weight (gm)	1	1.6 -	--
Length/Width	1	1.5 -	--
Width/Thickness	2	4.0 - 4.9	1.5
Base/Body	2	87 - 92	89
HBE/NW	2	93 -100	96
Variety 2			
Length (mm)	2	14.8 - 25.0	19.9
Body Width (mm)	2	10.0 - 15.1	12.5
Thickness (mm)	2	2.7 - 3.9	3.3

TABLE 9--Continued

Dimension	N	Range	$\bar{X}$
Base Width (mm)	2	11.0 - 16.0	13.5
Neck Width (mm)	2	6.0 - 6.5	6.2
Notch Width (mm)	2	2.5 - 4.0	3.2
Basal Edge (mm)	2	3.5 - 5.0	4.2
Basal Form (mm)	2	-0.5 - 0	-0.2
Weight (gm)	1	0.5 -	--
Length/Width	2	1.5 - 1.7	1.6
Width/Thickness	2	3.7 - 5.2	4.4
Base/Body	2	91 - 94	92
HBE/NW	2	120 -140	130
Variety 3			
Length (mm)	4	20.0 - 25.5	22.9
Body Width (mm)	4	12.4 - 19.5	15.3
Thickness (mm)	6	2.1 - 4.9	3.2
Base Width (mm)	4	13.7 - 19.4	16.2
Neck Width (mm)	5	9.0 - 15.0	10.8
Notch Width (mm)	6	1.9 - 3.5	2.7
Basal Edge (mm)	6	2.5 - 5.5	4.1
Basal Form (mm)	5	0 - 0.9	0.2
Weight (gm)	3	0.9 - 1.4	1.1
Length/Width	3	1.6 - 1.7	1.6

TABLE 9--Continued

Dimension	N	Range	$\bar{X}$
Width/Thickness	4	4.0 - 6.6	4.7
Base/Body	3	91 - 110	103
HBE/NW	6	120 - 230	161
Variety 4			
Length (mm)	5	15.0 - 42.0	23.0
Body Width (mm)	5	11.2 - 15.2	12.8
Thickness (mm)	5	2.8 - 4.0	3.3
Base Width (mm)	5	9.7 - 13.6	11.3
Neck Width (mm)	5	5.9 - 9.1	7.5
Notch Width (mm)	5	2.8 - 3.1	2.9
Basal Edge (mm)	5	2.0 - 4.5	2.8
Basal Form (mm)	5	-0.8 - 0.8	-.04
Weight (gm)	5	0.5 - 2.3	1.0
Length/Width	5	1.2 - 2.8	1.8
Width/Thickness	5	3.4 - 4.0	3.9
Base/Body	5	110 - 120	114
HBE/NW	5	80 - 150	107
Variety 5			
Length (mm)	9	16.0 - 31.5	23.0
Body Width (mm)	18	10.5 - 20.3	14.0
Thickness (mm)	18	1.9 - 4.9	3.7

TABLE 9--Continued

Dimension	N	Range	$\bar{X}$
Base Width (mm)	14	8.4 - 17.8	11.9
Neck Width (mm)	18	6.8 - 14.5	9.6
Notch Width (mm)	18	3.0 - 6.0	3.9
Basal Edge (mm)	18	0 - 3.9	2.1
Basal Form (mm)	15	-0.9 - 1.0	0.2
Weight (gm)	12	0.5 - 1.8	1.1
Length/Width	9	1.3 - 2.8	1.8
Width/Thickness	18	2.8 - 6.0	3.9
Base/Body	14	97 - 140	118
HBE/NW	6	30 - 130	69
Variety 6			
Length (mm)	3	17.5 - 25.0	20.1
Body Width (mm)	4	12.0 - 23.3	16.4
Thickness (mm)	4	2.5 - 4.5	3.3
Base Width (mm)	5	10.1 - 15.5	12.9
Neck Width (mm)	4	7.2 - 11.2	9.0
Notch Width (mm)	5	2.7 - 4.7	3.7
Basal Edge (mm)	5	2.7 - 3.7	3.2
Basal Form (mm)	5	0 - 1.0	0.5
Weight (gm)	3	0.7 - 1.2	1.0
Length/Width	2	1.4 - 1.5	1.4

TABLE 9--Continued

Dimension	N	Range	$\bar{X}$
Width/Thickness	4	3.9 - 5.2	4.7
Base/Body	4	97 - 110	101
HBE/NW	5	97 - 110	97
Variety 7			
Length (mm)	3	21.0 - 27.4	23.6
Body Width (mm)	4	14.0 - 18.5	16.6
Thickness (mm)	5	4.1 - 6.0	4.9
Base Width (mm)	4	6.1 - 14.9	12.2
Neck Width (mm)	5	6.0 - 7.5	9.3
Notch Width (mm)	4	5.5 - 8.5	6.5
Basal Edge (mm)	5	1.0 - 2.0	1.6
Basal Form (mm)	4	0 - 1.0	0.2
Weight (gm)	3	1.1 - 2.5	1.8
Length/Width	3	1.5 -	1.5
Width/Thickness	4	3.0 - 3.7	3.7
Base/Body	3	120 - 140	120
HBE/NW	4	12 - 35	25

Variety 1 points are identical to Forbis' (1962: 96-7) Washita variety which occurred in Layers 1-4 at the Old Woman's Buffalo Jump with an estimated beginning date of about A. D. 1500. This variety has not been illustrated from published sites in southern Manitoba (MacNeish 1954, 1958; Capes 1963) and appear to be much less common in the Manitoba collections I have seen than on the northwestern Plains. Variety 1 points conform to specimens found at the Mortlach and Long Creek sites (Wettlaufer 1955: Plate 1, No. 8; Wettlaufer and Mayer-Oakes 1960: Plate 7, No. 2) and at Pictograph Cave III (Mulloy 1958: 33). They have also been reported from the upper layers of the Gull Lake and Walter Felt sites and above Layer 19 at the Boarding School Bison Drive site where a date of A.D. 1590 ± 150 was determined (Kehoe 1966: 834; 1967: 44). The Boarding School sample was contaminated by recent carbon and probably should be slightly earlier (Crane and Griffin 1961: 119-20).

Variety 2 points correspond to Pekisko points found in Layers 1-4 at the Old Woman's Buffalo Jump and estimated to have appeared about A.D. 1200 (Forbis 1962: 98). Comparable points are illustrated by MacNeish (1958: Plate VII, Nos. 4-6) and are reported to occur in the Selkirk and Manitoba phases of southeastern Manitoba.

Variety 3 points correspond to the Paskapoo points found in Layers 1-10 at the Old Woman's Buffalo Jump and

estimated to date from A.D. 1000 (Forbis 1962: 99). This variety is common in Manitoba collections I have seen although none were described by MacNeish (1954, 1958). Capes (1963: Plate IV, Nos. 11, 13, 17) illustrates three specimens from Lone Mound, a Manitoba phase component, located on the Assiniboine River north of Alexander, Manitoba.

Variety 4 points are comparable to Irvine points found in all layers of the Old Woman's Buffalo Jump but most common in Layers 9 to 14 estimated to date from A.D. 600 to A.D. 1200 (Forbis 1962: 102). In Manitoba two similar points are illustrated by Capes (1963: Plate IV, Nos. 10, 14), one from the South Antler locality and one from Lone Mound.

Variety 5 points resemble Forbis' (1962: 100) Lewis points for which he gives an estimated life span of A.D. 600 to A.D. 1600. MacNeish (1958: Plate VII, No. 3) illustrates a comparable point from southeastern Manitoba and the Stott Corner-notched type from the Stott Mound and Village appears to be similar (MacNeish 1954: 40). Comparable varieties from the Gull Lake site have a beginning date of A.D. 730 ± 830-31 (Kehoe 1966: 830-31).

Variety 6 points resemble Nanton points from the Old Woman's Buffalo Jump which have an estimated life span of A.D. 600 to A.D. 1700 (Forbis 1962: 99-100). MacNeish (1958: Plate VII, No. 5) illustrates a comparable specimen

from southeastern Manitoba and Capes (1963: Plate IV, Nos. 9, 15, 16, 18) illustrates points of this variety found at Elliot Village and Lone Mound.

Variety 7 points are identical to High River points from the Old Woman's Buffalo Jump except that they average about 3 mm. wider than the Alberta specimens. They were found in Layers 11 to 14 and are believed to have had a life span of A.D. 600 to A.D. 1350 (Forbis 1962: 102). Forbis (1962: 102) feels that MacNeish's (1954: 40) Stott Corner-notched points are comparable. At the Mortlach site comparable points occurred in both the Moose Jaw and Pelican Lake components (Wettlaufer 1955: Plate 3, No. 9, Plate 11, Nos. 4-5).

Miscellaneous Projectile Points (Plate 3 e-l)

The following points did not fit any of the foregoing categories. Six different forms are represented.

Form 1 (Plate 3 e, f)

Sample: 2

Discrete Attributes: These points are triangular in outline with straight blade edges and bases and have shallow corner notches with straight to sloping shoulders. Broad, shallow flake scars extend over both faces of the points. Basal grinding is absent and both points are made of "Knife River Flint". These points resemble the Pelican Lake type

but have shallower notches and wider necks.

Metrical Attributes: See Table 10.

Form 2 (Plate 3 g, h)

Sample: 2

Discrete Attributes: These are broad, short, corner notched points with convex blade edges, straight bases and sloping shoulders. The flaking is well executed with flake scars covering both faces of the points. Basal grinding is absent. One point is made of "Knife River Flint" and 1 is made of tan chalcedony. These are similar to Besant points except for their having incipiently barbed shoulders.

Metrical Attributes: See Table 10.

Form 3 (Plate 3 i)

Sample: 3

Discrete Attributes: These points appear to have been fairly long with convex blade edges and straight bases. Rather large side notches are placed low on the blade creating rounded basal edges and sloping shoulders. The flaking is carefully executed with the flake scars extending to the mid-point or beyond on both faces of the points. All are made of "Knife River Flint". These points resemble the Avonlea type but are larger and have much broader and deeper notches.

Metrical Attributes: See Table 10.

Form 4 (Plate 3 j)

Sample: 1

Discrete Attributes: This point is corner notched with straight shoulders, convex blade edges and a convex base. Except for the convex base it resembles Form 2 points. Flaking covers both faces of the artifact and light basal grinding is present. The point is made of grey chert.

Metrical Attributes: See Table 10.

Form 5 (Plate 3 k)

Sample: 1

Discrete Attributes: This point has straight blade edges and a straight base with corner notches so wide as to actually create a nearly straight stem. Flaking is unifacial with short, irregular flake scars. Basal grinding is absent. The specimen is made of basalt. If the notches were less wide this point would resemble the Pelican Lake type.

Metrical Attributes: See Table 10.

Form 6 (Plate 3 l)

Sample: 1

Discrete Attributes: This is the only artifact at the site made of obsidian. In outline it is very much like the Form 5 point with straight blade edges and a short, nearly straight stem. Flaking is bifacial and carefully

executed. Basal grinding is absent.

Metrical Attributes: See Table 10.

Fragmentary Projectile Points

In addition to the above projectile points, 30 unclassifiable point tips and midsections were found.

TABLE 10

MISCELLANEOUS POINT METRICAL ANALYSIS

Dimension	N	Range	$\bar{X}$
Form 1			
Length (mm)	1	41.0 -	--
Body Width (mm)	2	20.7 - 22.0	21.4
Thickness (mm)	2	4.9 - 5.1	5.0
Base Width (mm)	2	12.1 - 17.0	14.6
Neck Width (mm)	2	14.8 - 15.0	14.9
Notch Width (mm)	2	4.0 - 5.0	4.5
Basal Form (mm)	2	0 - 0	0
Weight (gm)	1	4.0 -	--
Length/Width	1	1.9 -	--
Width/Thickness	2	4.0 - 4.6	4.3
Form 2			
Length (mm)	2	25.8 - 27.8	26.8
Body Width (mm)	2	21.2 - 21.5	21.4
Thickness (mm)	2	5.6 - 6.8	6.2
Base Width (mm)	2	18.0 - 19.4	18.7
Neck Width (mm)	2	15.0 - 16.0	15.5
Notch Width (mm)	2	5.5 - 6.5	6.0

TABLE 10--Continued

Dimension	N	Range	$\bar{X}$
Basal Form (mm)	2	0 - 0	0
Weight (gm)	2	2.1 - 2.5	2.3
Length/Width	2	1.2 - 1.3	1.25
Width/Thickness	2	3.1 - 3.8	3.3
Form 3			
Length (mm)	0		
Body Width (mm)	3	15.0 - 19.1	17.2
Thickness (mm)	3	4.5 - 5.5	5.0
Base Width (mm)	2	14.5 - 18.0	16.3
Neck Width (mm)	2	11.0 - 12.6	11.8
Notch Width (mm)	3	5.0 - 6.0	5.6
Basal Form (mm)	3	0 - 0	0
Weight (gm)	1	2.3 -	--
Length/Width	0		
Width/Thickness	3	3.3 - 3.5	3.3
Form 4			
Length (mm)	1	30.8 -	--
Body Width (mm)	1	21.0	--
Thickness (mm)	1	5.2	--
Base Width (mm)	1	18.0	--
Neck Width (mm)	1	15.5	--

TABLE 10--Continued

Dimension	N	Range	$\bar{X}$
Notch Width (mm)	1	4.8 -	--
Basal Form (mm)	1	-3.0 -	--
Weight (gm)	1	3.1 -	--
Length/Width	1	1.5 -	--
Width/Thickness	1	4.0 -	--
Form 5			
Length (mm)	1	37.0 -	--
Body Width (mm)	1	15.5 -	--
Thickness (mm)	1	5.2 -	--
Base Width (mm)	1	9.5 -	--
Neck Width (mm)	1	9.3 -	--
Notch Width (mm)	1	3.9 -	--
Basal Form (mm)	1	0 -	--
Weight (gm)	1	1.9 -	--
Length/Width	1	2.4 -	--
Width/Thickness	1	4.2 -	--
Form 6			
Length (mm)	1	45.0 -	--
Body	1	227.5 -	--
Thickness (mm)	1	5.5	--

TABLE 10--Continued

Dimension	N	Range	$\bar{X}$
Base Width (mm)	1	7.0 -	--
Neck Width (mm)	0		
Notch Width (mm)	0		
Basal Form (mm)	1	1.5 -	--
Weight (gm)	1	3.3	--
Length/Width	1	1.6	--
Width/Thickness	1	4.1	--

CHAPTER VI

SCRAPING AND DRILLING TOOLS

Excavations by Vickers and by the University of Manitoba produced 113 end scrapers, 135 side scrapers, 8 large scraping tools and 7 drills. Scrapers are defined as unifacially flaked tools having one unworked surface, known as the ventral surface, and one worked surface, known as the dorsal surface. The primary function of these tools was probably to remove the hair and excess flesh from hides although they may also have been used in working wood and bone.

There were two major groups of scrapers found at the site; end scrapers and side scrapers. The end scrapers, except for 3 split pebble scrapers, were all made from blade-like flakes and have their primary working edge on the distal end of the flake opposite the bulb of percussion. Nine measurements, including weight, were attempted on each end scraper (Fig. 5).

The side scrapers were also made from blade-like flakes but differ in having the lateral edges as the primary working edge. Secondary flaking on the side scrapers was minimal leaving a number of flakes only slightly modified. In some cases, however, the flaking was so fine

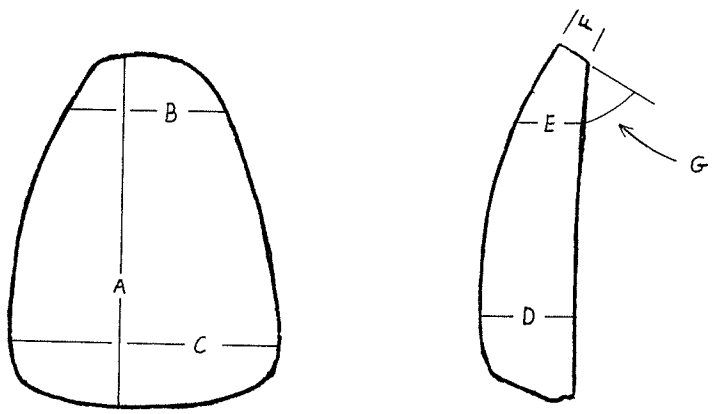


Figure 5. Measurements Taken on End Scrapers. a, length; b, proximal width; c, distal width; d, maximum thickness; e, distal thickness; f, striking platform; g, angle of striking platform.

that it was impossible to determine whether they were purposely retouched or whether the flaking resulted from their being handled and stored loosely together or from natural causes. In most cases, however, one or more edges are clearly worked. Seven measurements, including weight, were attempted on each side scraper (Fig. 6).

End Scrapers

Three types were distinguished within this group on the basis of (1) the shape of the flake from which they were made and (2) the presence or absence of working on the dorsal surface.

Type 1: Plano-Convex End Scrapers (Plate 9 a-d)

Sample: 36

Discrete Attributes: The most diagnostic feature of this type is that the entire dorsal surface has been worked creating a dome-like transverse section. Only 5 (1.3%) of the specimens have portions of the primary flake scar on the dorsal surface which have survived the secondary flaking. The ventral surface was never worked. The lateral edges are straight to slightly convex and are always retouched. The working edges of all but one specimen show moderate to heavy tertiary use retouch.

It is impossible to determine the type of flake from which the plano-convex scrapers were manufactured since the

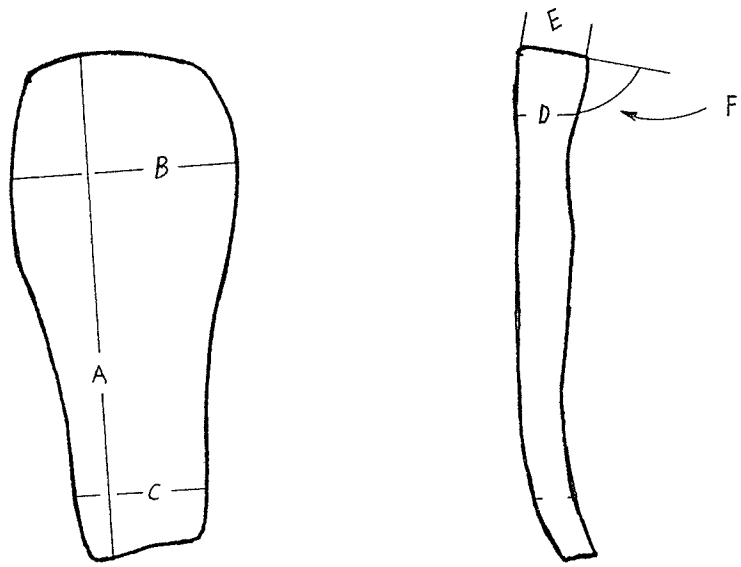


Figure 6. Measurements Taken on Side Scrapers. a, length; b, proximal width; c, distal width; d, thickness; e, width of striking platform; f, angle of striking platform.

primary flake scars on the dorsal surface have been completely obliterated. Striking platforms remain on the proximal ends of 15 (41.6%) of the scrapers and averaged 2.3 mm. in width. In 4 (27.7%) cases the natural surface of the nodule served as the striking platform and in 11 (73.6%) cases the striking platform appears to have been prepared by removing a flake from across the striking surface of the core. The angle between the ventral surface of the flake and the striking platform ranges from 45° to 90° and averages about 70°. Thirty-three (91.8%) of the plano-convex scrapers are made of "Knife River Flint", 2 (5.5%) are made of chert and 1(2.7%) is made of black flint.

Metrical Attributes: See Table 11.

Type 2: Prismatic End Scrapers (Plate 9 e-h)

Sample: 34

Discrete Attributes: Prismatic end scrapers were made from ridged or prismatic blade-like flakes. This type of flake was struck from the "peak" of a core, that is, the point left between the scars created by the removal of two adjacent flakes. This was an optimum point of impact from which to strike flakes from a core and resulted in flakes with a central ridge running down the dorsal surface. End scrapers were made from these flakes by working the distal end of the flake from the ventral surface but leaving the

TABLE 11

PLANO-CONVEX SCRAPER METRICAL ANALYSIS

Dimension	N	Range	$\bar{X}$
Length (mm)	31	15.9 - 43.1	24.5
Prox. Width (mm)	30	6.0 - 21.5	11.2
Dist. Width (mm)	34	17.9 - 29.5	22.2
Max. Thickness (mm)	32	4.4 - 9.5	6.9
Prox. Thickness (mm)	31	2.1 - 6.0	3.8
Dist. Thickness (mm)	32	3.8 - 7.6	6.2
Weight (gm)	30	1.0 - 3.6	3.3
Striking Plat. (mm)	15	1.0 - 4.5	2.3
Angle	15	45° - 90°	71.2°

ridged dorsal surface unretouched. These scrapers are triangular, or rarely, rectangular in outline depending upon the shape of the flake from which they were made. The lateral edges tend to be straight, or, less often, slightly concave or convex and are retouched in 67.5% of the cases. The working edges show evidence of teriary use retouch in 32 (94.1%) cases.

Striking platforms remained on the proximal ends of 18 (52.9%) of the prismatic scrapers and averaged 2.3 mm. in width. Ten (55.5%) of the striking platforms appear to have been prepared by removing a flake from the striking surface, 5 (27.1%) consisted of the natural surface of the nodule and 3 (17.4%) of the striking platforms were crushed.

Twenty-four (70.7%) of the scrapers in this group are made of "Knife River Flint", 6 (17.7%) are made of chert, 2 (5.8%) of chalcedony and 2 (5.8%) of black flint.

Metrical Attributes: See Table 12.

Type 3: Lamellar End Scrapers (Plate 9 i-1)

Sample: 34

Discrete Attributes: These scapers were made from flakes removed from either the flat, cortical surface of a nodule or, equally often, from flakes struck from the channel on a core created by the previous removal of a flake. The dorsal surface of the flake was either flat or fluted with three facets on the dorsal surface rather than

TABLE 12

PRISMATIC SCRAPER METRICAL ANALYSIS

Dimension	N	Range	$\bar{X}$
Length (mm)	28	15.9 - 43.1	24.9
Prox. Width (mm)	22	5.9 - 17.0	11.6
Dist. Width (mm)	31	13.4 - 26.0	19.2
Max. Thickness (mm)	29	4.0 - 8.9	6.6
Prox. Thickness (mm)	28	1.1 - 6.0	3.9
Dist. Thickness (mm)	30	2.8 - 8.2	5.9
Weight (gm)	28	1.0 - 4.2	3.4
Striking Plat. (mm)	19	0.8 - 4.0	2.3
Angle	19	45° - 90°	71.2

two as on the prismatic flakes. The dorsal surface of the scrapers were unworked leaving the flat primary flake scar intact. In outline they are triangular or rectangular. The ventral surface is unworked. The lateral edges are straight to slightly convex with lateral retouching present in all cases. Tertiary use retouch is present on the distal ends of all specimens. Striking platforms survived on 12 (35.2%) of the scrapers and averaged 1.8 mm. in width. The angle between the ventral surface of the scraper and the striking platform averaged about 65°.

Twenty-nine (82.6%) specimens are made of "Knife River Flint", 2 (5.8%) of black flint, 2 (5.8%) of siliceous siltstone, 1 (2.9%) of chert and 1 (2.9%) of chalcedony.

Metrical Attributes: See Table 13.

Type 4: Split Pebble Scrapers (Plate 9, o, p)

Sample: 3

Discrete Attributes: These scrapers are made from pebbles or small nodules which have been split and retouched along the distal edge. The dorsal surfaces consist of the natural cortical surface of the pebbles and are without retouching except for the working edge which is placed on the distal end opposite to the bulb of percussion. The ventral surfaces, as on the plano-convex, prismatic and lamellar scrapers, are unworked. The lateral edges are irregularly retouched following the natural edges of the

TABLE 13

LAMELLAR SCRAPER METRICAL ANALYSIS

Dimension	N	Range	$\bar{X}$
Length (mm)	20	16.5 - 44.0	23.9
Prox. Width (mm)	21	7.4 - 16.7	11.6
Dist. Width (mm)	31	13.0 - 26.1	19.6
Max. Thickness (mm)	27	3.0 - 7.7	5.3
Prox. Thickness (mm)	20	2.1 - 5.0	3.3
Dist. Thickness (mm)	28	2.5 - 7.7	4.6
Weight (gm)	20	0.9 - 3.8	3.5
Striking Plat. (mm)	12	1.0 - 2.5	1.8
Angle	12	45° - 90°	65°

prbbles. Striking platforms were not present. The working edges of 2 of the scrapers show evidence of tertiary use retouching. Two (66.6%) are made of chert and 1 (33.3%) is made of "Knife River Flint".

Metrical Attributes: See Table 14.

Side Scrapers

The side scrapers are of interest because they represent functional tools and also because they represent the largest group of complete blade-like flakes found at the site. That some were intended as scraping tools is indicated by their well executed working edges and tertiary use retouch. Some, however, may simply represent initial stages in the production of other artifacts.

The working edge varies greatly in length, from about 5 mm. to 60 mm. and usually corresponds to the shape of the flake. The side scrapers could be placed into eight groups according to the form of the retouched edge:

Group 1: One straight edge (46.3%).

Group 2: Two straight edges (14.2%).

Group 3: One concave edge (6.7%).

Group 4: One convex edge (15.7%).

Group 5: One straight edge--one concave edge (3.8%).

Group 6: One straight edge--one convex edge (7.5%).

Group 7: One concave edge--one convex edge (2.9%).

Group 8: Two converging straight edges (2.9%).

TABLE 14

SPLIT PEBBLE SCRAPER METRICAL ANALYSIS

Dimension	N	Range	$\bar{X}$
Length (mm)	3	23.9 - 27.0	25.5
Prox. Width (mm)	3	7.0 - 17.1	12.3
Dist. Width (mm)	3	18.1 - 24.9	21.2
Max. Thickness (mm)	3	6.0 - 8.5	7.5
Prox. Thickness (mm)	3	3.0 - 6.1	4.9
Dist. Thickness (mm)	3	6.0 - 7.1	6.4
Weight (gm)	3	3.6 - 4.0	3.8
Striking Plat. (mm)	0		
Angle	0		

Two basic types of flakes were distinguished, lamellar and prismatic, although the distinction was by no means as clear cut as it had appeared to be from observing the end scrapers. It appears that flakes were struck from both ends of the cores or at least from more than one angle so that a complete flake may be prismatic in cross-section, for example, for only half its length. Twenty-nine (21.7%) of the flakes were fragmentary or otherwise unclassifiable. Of the remaining flakes 70 (52.7%) were classified as lamellar and 34 (25.6%) were classified as prismatic. The cortical surface of the nodule is present on 32% of all the flakes.

The lamellar flakes are flat and plate-like in cross-section. In outline 70.2% are triangular with expanding lateral edges and 29.8% are rectangular with parallel lateral edges. The cortical surface survived on 45% of the lamellar flakes but on only 25% of the prismatic flakes. The lamellar flakes also average about 1 mm. thinner than the prismatic flakes.

The prismatic flakes were struck from the ridge on a core left by the removal of two previous flakes or, in some cases, from the natural angular corner of a nodule. Unlike the lamellar flakes these are predominately rectangular in outline (75%) with only a quarter (25%) of the sample having expanding lateral edges. The prismatic

flakes average about 4 mm. longer than the lamellar flakes, about 1 mm. thicker and about 4 mm. narrower in maximum width (See Tables 15 and 16).

Striking platforms remained on 50.7% of the retouched flakes, only 3.1% more than on the more extensively retouched end scrapers. Striking platforms remained on 58.5% of the lamellar flakes and on 52.9% of the prismatic flakes. The width of the striking platforms averaged 2.0 mm. for the entire sample, an insignificant 0.1 mm. less than the mean width of the striking platforms on the end scrapers. This suggests that both side scrapers and end scrapers were manufactured from the same type of flakes.

Large Scraping Tools (Plate 10 i-k)

Eight large flakes have been unifacially flaked and/or show tertiary use retouch along the edges as if they had been used as scraping tools. These specimens are ovoid in outline and plano-convex in cross-section with rough irregular flaking on the dorsal surface. Six are made of chert, 1 of rhyolite and 1 of "Knife River Flint".

Drills (Plate 9 m, n)

Five flakes had been worked to a sharp, tapering point. Four have flaring bases while the fifth consists of only the point of a specimen. All are made of "Knife River Flint".

TABLE 15

PRISMATIC FLAKE METRICAL ANALYSIS

Dimension	N	Range	$\bar{X}$
Length (mm)	34	22.3 - 59.0	34.6
Prox. Width (mm)	23	9.5 - 24.4	16.4
Dist. Width (mm)	24	9.5 - 28.3	19.5
Thickness (mm)	35	2.9 - 10.1	5.6
Weight (gm)	27	2.3 - 14.1	5.6
Striking Platform (mm)	18	1.0 - 5.0	2.3
Angle	15	45° - 90°	71.7°

TABLE 16

LAMELLAR FLAKE METRICAL ANALYSIS

Dimension	N	Range	$\bar{X}$
Length (mm)	64	15.3 - 53.5	30.4
Prox. Width (mm)	41	12.2 - 19.5	16.2
Dist. Width (mm)	38	10.0 - 54.6	24.1
Thickness (mm)	71	1.3 - 9.5	4.6
Weight (gm)	68	1.1 - 14.1	3.7
Striking Platform (mm)	41	0.7 - 5.0	1.7
Angle	37	45° - 90°	70°

CHAPTER VII

BIFACES

Fifty-nine bifaces and biface fragments were found at the Avery site by Vickers and by the 1966 field crew. Bifaces are defined as lithic tools which have been bifacially worked to form a sharp cutting edge. Presumably these tools served in a variety of cutting tasks such as skinning, butchering and meat and hide processing. Many of the bifaces may have been set into handles of wood, bone or antler although no such handles were found. Some may be unfinished artifacts.

The bifaces were sorted into five classes each having a distinctive outline. A large number of bifaces, nearly half, were either fragmentary or consisted of aberrant forms. These were classified as miscellaneous bifaces. Four measurements were taken on the bifaces in each class: maximum length, maximum width, thickness and weight (Fig. 7). These data are summarized in Table 17. All measurements are given in millimeters except for weight which is given in grams.

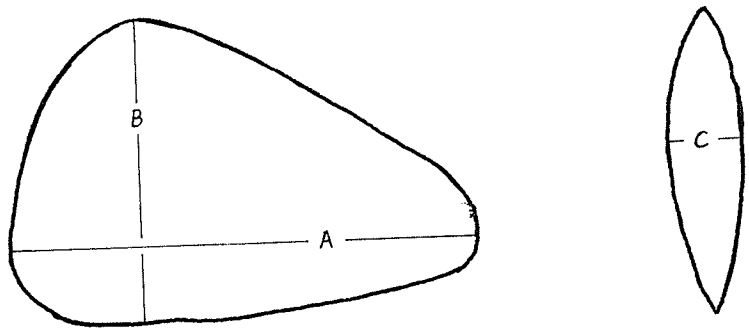


Figure 7. Measurements Taken on Bifaces.
a, maximum length; b, maximum width; c, thickness.

Biface Classification

Class 1: Crescent Shaped (Plate 11 a-d)

Sample: 7

Discrete Attributes: The bifaces in this class are characterized by having one straight edge and one convex edge. They are biconvex in cross-section with flake scars covering both faces of the artifacts. Only one specimen shows an unretouched portion of the primary flake scar. Four of the crescent shaped bifaces are made of "Knife River Flint", 2 of chert and 1 of black flint.

Metrical Attributes: See Table 17.

Class 2: Ovate (Plate 11 e-j)

Sample: 14

Discrete Attributes: Ovate bifaces are biconvex or plano-convex in cross-section with straight to convex bases and convex blades which converge to a blunt point. The quality of the flaking is highly variable. Some specimens are very rough without secondary flaking while others are carefully pressure flaked over both surfaces with fine retouching along the working edges. Striking platforms are not present. Three specimens are made of "Knife River Flint", 9 of chert and 1 of quartzite.

Metrical Attributes: See Table 17.

Class 3: Oval (Plate 12 a-c)

Sample: 3

Discrete Attributes: These are oval in outline except for a flat base consisting of either a true striking platform or an unretouched broken edge. All are plano-convex in cross-section. Flaking appears to have been largely by percussion with little or no secondary retouching. One biface is made of "Knife River Flint", 1 of chert and 1 of quartzite.

Metrical Attributes: See Table 17.

Class 4: Lanceolate (Plate 12 d-f)

Sample: 3

Discrete Attributes: Lanceolate bifaces have straight or convex bases, bifacially or unifacially worked, and long, convex edges which converge to a sharp point. They are biconvex in cross-section and flaking is well executed, extending across both faces and obliterating the primary flake scar. Striking platforms are not present. One biface is made of "Knife River Flint", 1 of chert and 1 of rhyolite.

Metrical Attributes: See Table 17.

Class 5: Rectangular (Plate 12 g-i)

Sample: 3

Discrete Attributes: These are biconvex in cross-

section with straight, oblique or rounded ends and straight, parallel blades. Flaking is well executed and extends over both faces of the specimens. Striking platforms are not present. All bifaces in this class are made of "Knife River Flint".

Metrical Attributes: See Table 17.

Miscellaneous Bifaces (Plate 13 a-h)

Twenty-five biface fragments and four complete bifaces did not fit into any of the above classes. One complete biface (Plate 13a) is irregular in outline and plano-convex in cross-section. Large, rough flake scars are present although some secondary retouching is present along the working edge. The specimen is made of rhyolite and measures 54.9 mm. long, 44.0 mm. wide and 16.5 mm. thick.

The second complete biface is an irregularly shaped chert flake bifacially worked along one edge (Plate 13 b). It is 44.0 mm. long, 41.5 mm. wide and 9.5 mm. thick. Two small oval bifaces are made of "Knife River Flint" (Plate 13 c) and measure 36.0 mm. in length, 36.9 mm. and 30.0 mm. wide, and 8.6 mm. and 7.5 mm. in thickness.

Two biface fragments have biconvex cross-sections and straight sides converging to a point (Plate 13 d, e). The largest specimen, made of "Knife River Flint", is 40.6 mm. long, 25.3 mm. wide and 7.5 mm. thick. The second specimen, made of chert, measures 33.2 mm. long, 24.3 mm. wide and

9.4 mm. in thickness.

Seven biface fragments consist of the rounded ends of specimens probably of the Class 2 or Class 3 form (Plate 13 f-h). All are biconvex in cross-section. In width they range from 22.5 mm. to 33.0 mm. with a mean of 31.2 mm. Thickness ranges from 4.8 mm. to 10.6 mm. with a mean of 7.3 mm. Four of the fragments are made of "Knife River Flint", 2 of chert and 1 of black flint.

Sixteen biface fragments are too small and incomplete to enable anything to be said about their probable form. A few may represent fragments of large projectile points. Nine are of "Knife River Flint", 3 of rhyolite, 3 of siliceous siltstone and 1 of limestone.

TABLE 17

METRICAL ATTRIBUTES OF BIFACE CLASSES

Dimension	N	Range	$\bar{X}$
Class 1			
Length (mm)	5	43.6 - 80.0	58.9
Width (mm)	7	16.2 - 23.9	20.6
Thickness (mm)	7	5.0 - 7.2	5.9
Weight (gm)	5	4.9 - 14.5	7.6
Class 2			
Length (mm)	11	29.0 - 62.3	44.3
Width (mm)	12	15.9 - 41.0	29.9
Thickness (mm)	14	4.8 - 14.0	8.7
Weight (gm)	12	2.5 - 22.5	10.3
Class 3			
Length (mm)	3	33.0 - 45.9	39.5
Width (mm)	3	31.9 - 39.0	34.3
Thickness (mm)	3	11.8 - 12.1	11.9
Weight (gm)	3	15.3 - 22.1	18.1
Class 4			
Length (mm)	3	36.0 - 66.0	48.6

TABLE 17--Continued

Dimension	N	Range	$\bar{X}$
Width (mm)	3	16.8 - 20.5	18.1
Thickness (mm)	3	4.5 - 16.6	10.3
Weight (gm)	3	4.7 - 19.0	9.5
Class 5			
Length (mm)	4	25.0 - 57.7	39.4
Width (mm)	4	20.8 - 28.0	24.8
Thickness (mm)	4	4.0 - 8.1	5.8
Weight (gm)	4	2.5 - 15.0	8.2

CHAPTER VIII

HEAVY STONE TOOLS

Thirty-one heavy stone tools were found at the Avery site, all by Vickers. These were placed into eight different classes according to the probable functions which they served.

Classification of Heavy Stone Tools

Class 1: Pebble Hammerstones (Plate 14 a-c)

Sample: 14

Description: The pebble hammerstones are irregularly shaped, ungrooved pebbles all of which show evidence of having been battered on their ends. Average maximum diameter is about 11 centimeters. All are smooth and rounded and would have served well as hammerstones without modification. Seven (50.1%) are of granite or similarly derived igneous material, 5 (35.8%) are of quartzite and 2 (14.3%) are of quartz.

Class 2: Grooved Mauls (Plate 15 a-c)

Sample: 7

Description: The first maul, made of granite, is 22.4 cm. in length and 12 cm. in maximum diameter (Plate 15 a).

A groove, 3.2 cm. wide and 0.4 cm. deep extends completely around the maul.

A second specimen, made of basalt, measures 15.7 cm. in length, 10.8 cm. in maximum diameter and is encircled by a groove 30.2 cm. wide and 0.7 cm. deep (Plate 15 b).

The third specimen, also made of basalt, is 10.3 cm. long and 9.2 cm. in maximum diameter. A groove, 1.8 cm. wide and 0.4 cm. deep encircles the maul except for a small area on one side. Both ends of the maul show evidence of considerable use (Plate 15 c).

The fourth maul has been split longitudinally and there is evidence of wear on only one end. This specimen is 14.8 cm. in length and 9.9 cm. in maximum diameter. The groove is 2.7 cm. wide and 0.3 cm. deep and apparently extended the entire circumference of the maul.

The fifth maul is made from an irregularly shaped granite cobble, 14.9 cm. long and 7.7 cm. in maximum diameter. The groove, 2.3 cm. wide and 0.2 cm. deep, extends about three-quarters of the circumference of the stone. Both ends show evidence of wear, however, the larger end has been used most extensively and several fragments have been broken off.

The sixth maul is made of basalt and has been split longitudinally. It measures 10.1 cm. in length and 7.4 cm. in diameter. The groove is 2.1 cm. wide and 2.5 cm. deep

and appears to have entirely encircled the maul. Considerable wear is evident on the larger end of the maul.

The last specimen is made of granite and is 7.5 cm. in length and 5.8 cm. in maximum diameter. A groove, 1.9 cm. wide and 0.2 cm. deep encircles the stone.

In addition to the grooved mauls described above, a small quartzite pebble, 4.9 cm. long and 3.4 cm. in diameter, has a shallow groove about 1.5 cm. wide which extends about three-quarters of the way around the stone.

Class 3: Choppers (Plate 14 d-f)

Sample: 3

Description: One specimen is a primary decortication flake struck from a large quartzite nodule and slightly retouched along one edge (Plate 14 d). It measures 9.4 cm. by 7.7 cm. The second specimen is a rectangular slab of non-micatious schist, 12.8 cm. long and 6.0 cm. wide, which has been partially bifacially flaked along the lateral edges and ground to an edge on one end (Plate 14 e). The last chopper is a slab of coarse-grained quartzite which has been roughly bifacially flaked around its edges. It measures 13.6 cm. in length and 9.0 cm. in width.

Class 4: Anvil (Plate 16)

Sample: 1

Description: This large, flat slab of schist, 28 cm.

by 30.5 cm. and 3.5 cm. thick, may have served as an anvil or crude metate. The surface shows evidence of some polishing although the amount of grinding that has taken place is difficult to ascertain since this type of stone occurs with a naturally flat, smooth surface.

Class 5: Rubbing Stones (Plate 17 a-d)

Sample: 4

Description: The first rubbing stone is an oval diorite cobble, 10 cm. in diameter and 5.5 cm. in thickness, with both flat surfaces polished and striated. In the center of each of the flat surfaces are circular pecked areas 2 cm. to 3 cm. in diameter (Plate 17 a).

The second specimen, also made of diorite, is roughly rectangular in form and measures 8.5 cm. by 7.5 cm. and is 3.5 cm. thick. Both surfaces are flat and polished. One surface has a shallow depression about 3.0 cm. in diameter and 8.0 cm. in depth. The other surface is smoother and darker in color than the rest of the stone and also has a small depression pecked into the center (Plate 17 b).

The third polishing stone is an irregularly shaped basalt cobble with a rough, pecked area about 2.0 cm. in diameter on one surface and a slightly smoothed, striated surface on the opposite side. It is impossible to determine whether the striations are of human or natural origin.

The fourth specimen is a large diorite cobble, 11 cm. in maximum diameter and 6.5 cm. in thickness. About a third of the stone has been broken off probably as a result of being exposed to fire. The flat surface of the stone shows a moderate polish.

Class 6: Pestle (Plate 18 b)

Sample: 1

Description: This is a cylindrical piece of soft limestone, 13.8 cm. long, 6.3 cm. in diameter at the large end and 4.5 cm. in diameter at the small end. The form of the stone may be natural as there is no evidence of modification except for a slight polish on each end.

Class 7: Steatite Tube (Plate 18 a)

Sample: 1

Description: A cylindrical piece of steatite, 11 cm. long, 3.9 cm. in diameter at the largest end and 3.1 cm. in diameter at the smaller end had a conical hole, 1.5 cm. in diameter and 4.0 cm. deep drilled in the larger end and a similarly conical 1.0 cm. wide and 1.5 cm. deep, in the smaller end. Evidently the objective was to drill a hole through the stone possibly for use as a pipe.

Class 8: Irregular Percussion Tool (Plate 18 c)

Sample: 1

Description: A section of gneiss, 23 cm. long and about 3.0 cm. by 5.7 cm. in diameter, shows evidence along the edges of being battered. No other evidence of modification was observed.

CHAPTER IX

POTTERY

Of the 3666 potsherds found at the Avery site, 252 (6.9%) were rim sherds and 3414 (91.1%) were body sherds. No complete or even partially complete vessels were recovered and only rarely could appreciably large sections of rims be reconstructed.

Pottery was found in all levels of the site but the distribution of the body sherds in the deposit showed no indication of a stratigraphic separation of types (Table 1). Too few rim sherds were collected under controlled conditions to construct a frequency distribution chart similar to (Table 1) however, Vickers did observe that sherds of Blackduck ware occurred stratigraphically above sherds of Laurel ware (1948a: 6; 1949b: 85). Since this agrees with data from other sites, such as Cemetery Point and Lockport in southeastern Manitoba (MacNeish 1958: 140-41) and Smith Mounds 3 and 4 and the Pearson site in Minnesota (Stoltman 1962: 11, 20-21), it suggests that some stratigraphic separation of artifacts occurred in the central portions of the site.

In this study, a mode is defined as any traditional

"standard, concept, or custom which governs the behavior of the artisans of a community" (Rouse 1960: 313). A type is defined as a group of artifacts sharing attributes which represent two or more culturally significant modes (Rouse 1960: 316) while ware is used as a generic term referring to a group of related pottery types, or groups of sherds not yet defined as types, which share similar kinds of paste, modes of manufacture, surface finish and vessel form (MacNeish 1958: 139).

The first step in classification involved counting the sherds and separating the body sherds from the rim sherds. Next, the attributes presumed to have cultural significance were listed for the entire sample. These included attributes of surface finish, decoration and rim form. There were no major differences in the attributes of paste, temper, texture, color and hardness. The Munsell Soil Color Charts and Moh's scale of hardness are used throughout. Coil breaks were observed on a number of body sherds but their occurrence crosscut classes of sherds defined on the basis of surface treatment. Vessel form could not be determined with certainty except for the lips and rims of the vessels.

The final step in classification involved sorting the sherds into classes sharing the same modes of surface finish, decoration and rim form. Since decoration and rim

could not be determined from the body sherds these were placed into classes sharing the same modes of surface finish (Table 18). The rim sherds were sorted into groups having the same rim form, decoration, and in cases where decoration was absent, surface finish. The procedure of classification was greatly aided by the fact that many of the sherds could be identified as belonging to already established types. Thus by simply determining the presence of the diagnostic modes of the established types in the sample being studied, groups of sherds sharing culturally significant modes could be formed.

The body sherds were placed into nine classes. Five of these classes comprise 87.1% of all body sherds (Table 18). Four hundred, or 11.9% and 16 (6.3%) rim sherds were split or otherwise unclassifiable. The rim sherds were classified into five wares including six different types plus seven groups of aberrant sherds.

Description of the Body Sherds

Class 1: Plain)Plate 19 a)

These sherds have a plain, smooth surface finish. This class was probably enlarged by the inclusion of sherds which had their original surface finish obliterated by smoothing the vessels while the clay was still wet. Occasionally faint traces of brushing or wiping can be

detected on the sherds. Color ranges from light yellowish brown (Munsell 10YR 6/4) to black, often varying considerably on a single sherd. The sherds are uniformly grey in cross-section. Thickness varies from 3 mm. to 9 mm. with an average of about 6.6 mm. Hardness measures about 3 and coil breaks occur on 3.3% of the sherds. One sherd, with a coil break, appears to have been covered with a wash of red ochre.

Class 2: Cord-Wrapped Paddle Impressed (Plate 19 b, c)

These sherds were impressed with a paddle wrapped with closely spaced cords usually composed of two strands wound with either a clockwise (S) or counterclockwise (Z) twist. The cords varied from 1 mm. to 3 mm. in diameter and averaged about 2 mm. in diameter. A few sherds had been impressed with a paddle irregularly wound with very widely spaced cords. Judging from the position of the coil breaks, which are present on 4.1% of the sherds, the cord impressions ran either parallel or horizontal to the vertical axes of the vessels. The usual range of colors is from very pale brown (Munsell 10YR 7/4) to dark brown (10YR 2/2). Hardness is about 3 and thickness is from 4 mm. to 11 mm. with a mean of 7.2 mm.

Class 3: Linear Stamped (Plate 19 d, e)

This class of sherds is characterized by having a

surface finish made by impressing a toothed object into the clay at closely spaced intervals. This technique differs from dentate stamping in that the stylus was dragged along the surface of the vessel for a short distance, lifted and then dragged again etc., creating a series of short, parallel impressions which resemble, at first glance, a series of impressions made with a cord-wrapped stick. The impressions ranged from 2 mm. to 6 mm. long and from 1.0 mm. to 2 mm. The spacing between the impressions averaged about 3 mm. Color is pale or light yellowish brown (Munsell 10YR 6/3.5) to black. Hardness is about 3 and thickness varies from 5 mm. to 11 mm. averaging 7.4 mm. Coil breaks are most abundant in this class, occurring on 10.7% of the sherds.

Class 4: Fabric Impressed (Plate 19 f, g)

The sherds in this class have an irregular, rough surface finish which is apparently the result of having been impressed with a coarsely woven fabric. Although varying degrees of smoothing have obscured the details of the fabric, it appears to have consisted, at least in some cases, of weft elements about 3 mm. in diameter, perhaps of babiche, twined over and under warp elements which were spaced at intervals of about 5 mm. Color varies, often on one sherd, from brown (Munsell 10YR 5/3) to black with grey interiors. Hardness is as high as 4.5 mm. and thickness

varies from 3 mm. to 8 mm. averaging about 4.9 mm. No coil breaks were observed in this class.

Class 5: Simple Stamped (Plate 19 h, i)

These sherds have a surface finish which was created by pressing a grooved or thong-wrapped paddle into the clay to produce a series of wide, shallow grooves. This technique is usually known as simple stamping although Griffin (1965: 27) has suggested that "grooved paddled" is the more correct term. The grooves are from 3 mm. to 5 mm. wide and never more than 1 mm. deep. Color is from very pale brown (Munsell 10YR 7/4) to black. There is often a considerable range of color on a single sherd. In cross-section the cores of the sherds are dark grey. Hardness is about 4 and thickness varies from 4 mm. to 7.3 mm. with an average of about 5.8 mm. Only one probable coil break was found.

Class 6: Cord-Wrapped Stick Impressed

These are probably neck or near-rim sherds rather than true body sherds since cord-wrapped stick impressions are usually a part of the decoration of a vessel rather than the surface finish. The impressions are spaced from 1.5 mm. to 6 mm. apart and are from 1.5 mm. to 5 mm. wide. The sherds are generally dark in color, from greyish brown (Munsell 2.5YR 5/2) to black, while in cross-section the

cores are brown or black. Thickness is from 6 mm. to 8 mm. Hardness is about 3 and no coil breaks were observed.

Class 7: Dentate Stamped (Plate 19 j, k)

These sherds were decorated by impressing a notched object, 1 mm. to 2 mm. wide, into the clay. Each individual dentate impression measures from 1.5 mm. to 2.8 mm. in length. Since dentate stamping is usually a part of the decorative motif these sherds are probably from near the rim rather than from the lower part of the body. In color the dentate stamped sherds seem to fall into two classes, one light yellowish brown (Munsell 10YR 6/4) and the other ranging from greyish brown (10YR 5/2) to black. The cores of the sherds are usually the same color as the surface. Hardness measures about 3 and thickness varies from 5.2 mm. to 9.5 mm. with an average of 7.3 mm. Coil breaks are not present.

Class 8: Punctate (Plate 19 l-p)

This class includes sherds with four different types of punctations. Eight sherds are covered with rows of small oval punctations (Plate 19 l). These sherds are pale brown in color (Munsell 10YR 6/3) and range from 8 mm. to 9.5 mm. in thickness. One coil break was observed in this group and several of the sherds appear to have been covered with a wash of red ochre.

TABLE 18

THE BODY SHERDS FROM THE AVERY SITE

	Class	N	%
1.	Plain	901	26.5
2.	Cord-Wrapped Paddle	711	20.1
3.	Linear Stamped	571	16.7
4.	Fabric Impressed	582	17.1
5.	Simple Stamped	184	5.4
6.	Cord-Wrapped Stick	17	0.5
7.	Dentate Stamped	15	0.4
8.	Punctate	16	0.4
9.	Incised	2	0.05
	Miscellaneous	400	11.7
	Totals	3399	98.85

One sherd has two rows of crescendic punctations (Plate 19 m). It is dark grey in color (Munsell 10YR 4/1) and 8.5 mm. thick. Seven sherds have a single row of small punctations over a plain or cord-wrapped paddled surface finish (Plate 19 n, o). Some of the sherds appear as if they had originally been fabric impressed and then smoothed. Three of these are curved in cross-section and evidently formed part of the neck of a vessel (Plate 19 o).

Class 9: Incised (Plate 19 p)

The two sherds in this class have been incised with a sharp instrument about 1 mm. in width. The incisions were made while the clay was still wet and occur in parallel lines spaced about 6 mm. apart. Both sherds are light brownish-grey in color (Munsell 10YR 6/2) and 6.5 mm. in thickness. Coil breaks were not present.

Pottery Classification

WARE: LAUREL (Plate 20)

Sample: 44 rim sherds and 15 near-rim sherds from Class 6 (Dentate). An undetermined number of Laurel body sherds are believed to be represented in Classes 1 (Plain) and 3 (Linear Stamped).

Paste:

Temper: Particles of quartz, feldspar and mica ranging in size from barely visible up to about 2 mm. in diameter.

The source was probably crushed granite.

Texture: Coarse, ranging from fairly compact to crumbly.

Color: Light yellowish brown (Munsell 10YR 6/4), brown (10YR 5/3) and black. The sherds are generally of the same color in cross-section as on the surface. A number of the sherds have encrustations of carbon adhering to the interior surface.

Hardness: About 3.

Method of Manufacture: The vessels were probably made by the coil method. Coil breaks were observed on seven rim sherds, 3.3% of the Class 1 body sherds and 10.7% of the Class 3 body sherds. Although MacNeish (1958: 144) and Wright (1967: 25-26) agree that the Laurel ceramics they analyzed were probably manufactured by the coil method, Stoltman (1962: 38) states that coil breaks were not observed on Laurel sherds in Minnesota.

Vessel Form:

Lip: Rounded or partially flattened.

Rim: Straight to slightly outflaring (Fig. 9 a-d). Thickness at the lip ranges from 3 mm. to 8 mm.; thickness of the rim below the lip ranges from 6 mm. to 10 mm.

Neck: Judging from one large sherd, necks appear to

have been non-existent with the rims blending into a conoidal body. MacNeish (1958) and Stoltman (1962) substantiate this with similar data from southeastern Manitoba and Minnesota.

Body: No data exists from the Avery site, although MacNeish (1958: 144) and Stoltman (1962: 38) report ovoid to conoidal vessel forms.

Surface Finish: No data exists from the Avery site, but MacNeish (1958: 144) and Stoltman (1962: 38) report that Laurel ware has a consistently plain surface finish. The large number of linear stamped body sherds suggest that this technique may also have been used as a form of surface finish.

Decoration: At the Avery site, Laurel ware was decorated with punctations, dentate stamping and linear stamping.

Component Types: Laurel Dentate
Lockport Plain
Lockport Linear

Type 1: Laurel Dentate (Plate 20 a)

Paste, method of manufacture, vessel form and surface finish described under ware.

Reference: MacNeish 1958.

Sample: 2 rim sherds and 15 near-rim sherds from Class 7

probably all from the same vessel.

Decoration: At least four horizontal rows of dentate impressions encircle the rims. Above these are a series of dentate impressions extending obliquely to the left from the lip. The dentate impressions range from 1 mm. to 2 mm. wide and from 1.5 mm. to 2.8 mm. long. A row of oval punctations, 3 mm. by 5 mm. in diameter, are placed between the upper two rows of horizontal impressions (Plate 20 a; Fig. 8 a). The lip is plain and smooth.

Diagnostic Attributes

(1) Two or more horizontal rows of dentate stamping on the exterior of the rim.

(2) Oblique rows of dentate stamping along the exterior of the lip.

(3) Lips plain.

(4) Rims slightly outflaring (Fig. 9 a).

Temporal and Spatial Distribution: Laurel Dentate pottery was found in the Anderson and Nutimik phases of southeastern Manitoba and in small amounts in the Manitoba phase (MacNeish 1958: 140-41). Stoltman (1962: 113) reports this type in all Minnesota Laurel components and Wright (1967) found dentate sherds in Laurel Tradition sites across northern Ontario. Both MacNeish (1958: 145) and Stoltman (1962: 113) report the presence of this type in southeastern

Saskatchewan but neither give references to sites or sources of information. In all areas Laurel ceramics are stratigraphically the earliest to appear although there are few reliable dates available for the tradition. MacNeish's data from southeastern Manitoba would suggest that the Laurel Dentate type appeared as early as 500 B.C., however, Wright (1967: 121-22) found dentate stamping to be a comparatively late technique in the Ontario components.

Type 2: Lockport Plain (Plate 20 b, f)

Paste, method of manufacture, vessel form and surface finish described under ware.

Reference: MacNeish 1958.

Sample: 6 rim sherds, representing at least 2 different vessels, and probably some of the Class 1(Plain) body sherds.

Decoration: Punctations are the only decoration on these sherds. Two adjoining sherds have a single row of punctations which measure about 2.5 mm. by 6 mm. in diameter and are spaced 18 mm. to 20 mm. apart (Plate 20 f; Fig. 8 b). Three sherds, evidently from the same vessel, are decorated with a row of paired punctations, each about 2.5 mm. wide and 12 mm. in height. A series of incisions cut obliquely to the left across the rim (Plate 20 b; Fig. 9 c). This group of sherds has been covered with a wash of red ochre.

Diagnostic Attributes

(1) Decoration consists of a row of punctations encircling the exterior of the rim.

(2) Other decoration absent.

(3) Lips plain and rounded.

(4) Straight to slightly outflaring rims (Fig. 9 a, b).

Temporal and Spatial Distribution: The Lockport Plain type was reported by MacNeish (1958: 140-41) from the Anderson and Nutimik phases of southeastern Manitoba with a few specimens of the type surviving into Manitoba phase times. Wright (1967) reports nearly identical pottery from Laurel tradition sites in Ontario. He illustrates a sherd from the Heron Bay site (1967: Plate 2, No. 7), at the north end of Lake Superior, which appears identical to the sherds described above (Plate 20 b; Fig. 8 c) and also mentions finding a number of sherds having a wash of red ochre (1967: 11). Five radiocarbon dates were determined for the Heron Bay site ranging from A.D. 140 ± 150 to A.D. 790 ± 130. Wright (1967: 95-96) evidently regards all but the former date as unacceptably late. Although Stoltman (1962) does not describe a comparable type from Minnesota, his Laurel Bossed (1962: 115) may be related.

Type 3: Lockport Linear (Plate 20 c-e; 19 d, e)

Paste, method of manufacture and vessel form described under ware.

Reference: MacNeish 1958.

Sample: 35 rim sherds, representing at least 6 different vessels, and the Class 3 (linear stamped) body sherds.

Decoration: The linear stamped technique may have covered much of the vessel as indicated by the large number of linear stamped body sherds. This technique created a series of shallow impressions 1 mm. to 1.5 mm. wide and 2 mm. to 4 mm. long extending horizontally around the vessel (Plate 20 c-e; Fig. 8 d). The impressions appear to have been made with a toothed object similar to a comb, in fact, identical impressions could be made in modeling clay with a pocket comb. This technique is comparable to what is usually known as linear stamping although in some cases the tool was dragged over the surface as in the push and pull technique. At first glance the regularly spaced impressions appear identical to closely spaced cord-wrapped stick impressions. The spaces between the "teeth" are usually about 2 mm. but may be slightly less or up to 4 mm. The horizontal distance between the impressions ranges from nearly zero to about 2 mm. Most of the sherds were decorated by holding the "comb" vertically (Plate 20 c-e).

In a few instances, however, the "comb" was held horizontally producing vertical impressions but these always cut across rows of horizontal impressions.

Temporal and Spatial Distribution: This type appears to be closely related to MacNeish's Lockport Linear type which occurs in the Anderson and Nutimik phases of southeastern Manitoba, however, the assignment of these sherds to that type is considered tentative. Neither Wright (1967) nor Stoltman (1962) report comparable types from Laurel sites in Ontario and Minnesota. MacNeish and Capes (1958: 140) report a few body sherds from the United Church site at Rock Lake which showed "linear punctating with a stylus". These were classed under Laurel ware which occurred most abundantly in Levels 4 and 5, below Blackduck and Winnipeg Fabric Impressed types. I know of no other reported occurrences of this pottery type.

WARE: AVERY CORDED (Plate 21)

Sample: 31 rim sherds, representing a minimum of 7 different vessels, and an undetermined number of Class 2 (Cord-wrapped paddle) body sherds.

Paste

Temper: Angular particles of quartz, feldspar and mica, probably derived from crushed granite, which range in size from barely visible to about 4 mm. in diameter.

Texture: Coarse to very coarse and porous with the sherds having a tendency to split and crumble.

Color: Light yellowish brown (Munsell 10YR 6/4) to black with the darker colors being somewhat more common. In cross-section the cores are generally the same color as the surface. Carbon is frequently found adhering to the interiors of the sherds.

Hardness: From 2 to 3.

Method of Manufacture: Coil breaks were found on one of the rim sherds and on 4.1% of the Class 2 body sherds. While not conclusive these data suggest that some Avery Corded vessels were made by the coiling method. MacNeish and Capes (1958: 138) also found coil breaks on the Avery Corded sherds from the United Church site.

Vessel Form

Lip: Either flattened or rounded, often with an overhang of clay on the exterior edge (Fig. 9 e).

Rim: Straight to slightly outflaring (Fig. 9 e-g). Thickness at the lip ranges from 4 mm. to 8 mm. and thickness below the lip ranges from 6 mm. to 10 mm.

Neck: Probably non-existant, with the rim blending into a conoidal body.

Body: Probably conoidal.

Surface Finish: The sherds have been impressed with a cord-wrapped paddle wound with cords varying from 0.5 mm. to 1.5 mm. in width. The cords, composed of more than one strand, are tightly twisted in a clockwise (S-twist) fashion and have 5 to 8 twists per centimeter. The sherds seem to fall into two groups, one having the cord impressions running diagonally or horizontally around the vessel and the other having the impressions placed vertically on the vessel.

Decoration: Decoration is generally absent. One sherd has a series of impressions placed across the lip producing a scalloped form (Fig. 8 q). Another has a large, circular punctation, 10 mm. in diameter, on the exterior of the rim. Two adjoining sherds are decorated with a single row of elliptical punctations made by a pointed object thrust into the clay at an upward angle (Plate 21 g; Fig. 8 e).

MacNeish and Capes (1958: 138) observed embossing and irregular incising on the Avery Corded sherds from the United Church site. A partially reconstructed vessel of Avery Corded ware was found in the Melita locality in extreme southwestern Manitoba. It was decorated with a row of bosses on the rim and had a series of vertical incisions which cut diagonally

across the obliquely corded surface finish. The vessel was conoidal in form with a slightly flaring rim.

Two rim sherds from the Avery site have a reddish tint, evidently resulting from a wash of red ochre. MacNeish and Capes (1958: 138) report a similar occurrence at the United Church.

Component Types: None established.

Temporal and Spatial Distribution: Avery Corded ware was first recognized at the United Church site by MacNeish and Capes (1958: 137-39) where it occurred in levels 3, 4 and 5 below sherds of Blackduck and Winnipeg Fabric Impressed Ware. The only other occurrences of this ware in Manitoba are the Melita vessel (found by collectors near the town of Melita, Manitoba) and a single sherd reported to have been found by W. B. Nickerson in the Moore Group B mound (Capes 1963: 142, Plate X, No. 7). Both of these locations are in the extreme southwestern corner of Manitoba.

Wood (1962b: 232-36) reports pottery collected from two locations in north-central North Dakota, one about 25 miles east of Minot and the other near Towner. At least some of the sherds from both of these locations appear identical to Avery Corded ware

except for their having sand temper and generally lighter colors. Site 32MZ2 in northwestern North Dakota also yielded sherds identical to Avery Corded ware (Wood 1956: 21-24).

Farther afield, Avery Corded ware appears to be related to pottery from Plains Woodland components in South Dakota, Nebraska and Kansas (Hill and Kivett 1940; Kivett 1952, 1953). The Valley Cord Roughened type, with its distinctive oblique cord-wrapped paddle impressions, is strikingly like the obliquely corded sherds of Avery Corded ware. Plains Woodland components have been dated from an improbable 1880 B.C. ± 300 at the Schultz site in Nebraska (Hill and Kivett 1940: 147-93; Crane and Griffin 1958: 1121) to about A.D. 800 at sites in Kansas, Nebraska and South Dakota (Neuman 1967: 479-80).

WARE: TRUMAN PLAIN RIM (Plate 22)

Reference: Neuman 1960.

Sample: 16 rim sherds, probably representing 2 different vessels, and 184 body sherds from Class 5.

Paste

Temper: Particles of feldspar, quartz and mica which range in size from barely visible to about 3 mm. in diameter. Probably derived from crushed granite.

Texture: Coarse and porous but compact and with little tendency to split or crumble.

Color: Very pale brown (Munsell 10YR 7/4) to black with the darker values being somewhat more common. The sherds are grey to black in cross-section. There is often considerable color variation on a single sherd.

Hardness: About 4.

Method of Manufacture: The presence of only one coil break in the entire sample indicates that either the paste was compact enough not to break along the coil lines or that the vessels were mass modeled with occasional patches of clay added in the process of manufacture.

Vessel Form

Lip: Either flattened, apparently with the same grooved or thong-wrapped paddle used to create the impressions on the rim and body, or rounded and smoothed.

Rim: Very slightly outflaring (Fig. 9 h, i). Thickness ranges from 4.8 mm. to 7 mm.

Neck: Probably non-existant with the rims blending into a conoidal body.

Body: Probably conoidal. Thickness of the body sherds ranges from 4.8 mm. to 7 mm.

Surface finish: The vessels have been impressed with a grooved or thong-wrapped paddle creating a series of shallow grooves, 3 mm. to 5 mm. wide, running horizontally to diagonally around the vessel. The grooves are rarely more than 1mm. deep. Judging from impressions on the largest sherds the paddle used to create the surface impressions was about 60 mm. wide.

Decoration: Decoration is absent. The spiralling simple stamped impressions covered the entire vessel. Even the lips, in some cases, were flattened with the grooved or thong-wrapped paddle.

Component Types: None established. Although Neuman (1960) referred to this pottery as a type, I would prefer to use the broader category of ware considering the small sample and the evidently large geographical area involved.

Temporal and Spatial Distribution: MacNeish and Capes (1958: 146) reported finding two grooved paddle impressed sherds from level 3 of the United Church site and one such sherd was found at the Wall site, a surface site near Clearwater, Manitoba, about 8 miles southeast of the Avery site (Chris Vickers, personal communication, 1967). W. B. Nickerson found

simple stamped sherds at the Elliott and Riverview village sites in extreme southwestern Manitoba (Capes 1963: 24, 36, Plate 12, Nos. 9-11). The stamped sherds found at Elliott village may have been associated with the Middle Missouri tradition pottery also found at that site. Wettlaufer and Mayer-Oakes (1960: 26, Plate 6, No. 9) illustrate a rim sherd from Layer 1A at the Long Creek site which appears identical to Truman Plain Rim ware.

The most important find of this pottery was made at the Truman Mound site in central South Dakota (Neuman 1960). This site consisted of six mounds containing primary and secondary burials, pottery and lithic, bone and shell artifacts. The pottery, which Neuman (1960: 78) named Truman Plain Rim, consists of conoidal vessels with slightly flaring rims and flat to rounded lips. The surface was covered with simple stamped impressions which spiralled around the vessels from the base to the lips. Except for a few minor details of temper and texture this pottery is identical to the simple stamped sherds found at the Avery site. Material associated with this pottery at the Truman Mound site was dated at A.D. 750 ± 90 (Neuman 1967: 479).

WARE: BLACKDUCK OR MANITOBA CORDED (Plate 23 a-c)

Sample: 14 rim sherds and an undetermined number of Class 2 (Cord-wrapped paddle impressed) body sherds.

Paste

Temper: Angular particles of quartz, feldspar, mica and probably hornblende, ranging in size from barely visible to about 2 mm. in diameter and occasionally larger. The source was probably crushed granite.

Texture: Coarse and porous but with little tendency to split or crumble.

Color: Very pale brown (Munsell 10YR 7/4) to very dark grey (7.5 YR 3/0) both on the surface of the sherds and in cross-section. The darker colors are most common.

Hardness: About 3.

Method of Manufacture: No coil breaks were observed on the Avery sample. The coil breaks on the corded (Class 2) body sherds are not significant for this ware since Avery Corded ware is also represented in this class. Both Evans (1961c: 40) and MacNeish (1958: 156) believe that this ware was manufactured by the paddle and anvil method.

Vessel Form

Lip: Flattened and usually spread from pressure applied

to the surface.

Rim: Slightly outflaring (Fig. 9 j-l). MacNeish (1958: 157) and Evans (1961c: 36) report that Blackduck vessels are usually characterized by a thickened lip, however, this trait was not pronounced in the Avery sample. Thickness at the lip ranges from 5 mm. to 10 mm. and thickness of the rim below the lip is from 5 mm. to 7 mm.

Neck: No data available from the Avery site, however, reconstructed vessels from Minnesota (Evans 1961c) have a constricted neck above a globular body.

Body: Globular.

Surface Finish: There is no data on surface finish in the Avery site sample, however, Evans (1961c: 40) reports that 78.7% of the Minnesota Blackduck sherds had a cord-wrapped paddle impressed surface finish. On the remainder, 16.9% were fabric impressed and 5.4% were smooth. MacNeish (1958: 156) reports that all of the Blackduck pottery from southeastern Manitoba had a cord-wrapped paddle impressed surface finish. On the basis of this evidence it is assumed that the Class 2 (Cord-wrapped paddle impressed) body sherds were associated with this ware. A few of the Class 1 (Plain) and Class 4 (Fabric impressed) body sherds may also be associated.

Decoration: Decoration consists of various combinations of punctations and cord-wrapped stick impressions.

Component Types: Manitoba Horizontal
Stott Triangular

Type 1: Manitoba Horizontal (Plate 23 a)

Paste, method of manufacture, vessel form and surface finish described under ware.

Reference: MacNeish 1958.

Sample: 7 rim sherds, each representing a different vessel, and an undetermined number of body sherds, mostly from Class 2 (Cord-wrapped paddle impressed).

Decoration: The largest sherd of this type has three horizontal rows of cord-wrapped stick impressions, spaced 4 mm. apart, encircling the rim. Above these are a series of cord-wrapped stick impressions, placed obliquely to the left, and extending up to and across the lip. A row of circular punctations, 7 mm. in diameter, are placed between the two uppermost horizontal rows of cord-wrapped stick impressions (Plate 23 a; Fig. 8 f). Of the remaining Manitoba Horizontal sherds, all have design elements essentially the same as that described above. In one case the cord-wrapped stick impressions extend across the lip and onto the inner side of the lip. Three small

sherds have cord-wrapped stick impressions placed obliquely to the left (Fig. 8 g) or to the right (Fig. 8 h) on the rim with plain lips above at least one horizontal row of cord-wrapped stick impressions.

Diagnostic Attributes:

(1) A series of cord-wrapped stick impressions, usually placed obliquely to the left, along the exterior of the lip.

(2) Two or more horizontal rows of cord-wrapped stick impressions encircling the rim.

(3) A row of punctations encircling the rim.

(4) Lips are decorated with rows of cord-wrapped stick impressions.

(5) Rims slightly outflaring (Fig. 9 k, l) with the lips always flattened.

Temporal and Spatial Distribution: Manitoba Horizontal is the most common type of Blackduck ware. In the Rock Lake locality it was found in the upper three levels of the United Church site (MacNeish and Capes 1958: 142-44, Plate 6, No. 9) and at the Calf Mountain and Shewfelt sites (Chris Vickers, personal communication, 1967). In southeastern Manitoba, Manitoba Horizontal is one of the most abundant types in components of the Manitoba

phase, estimated by MacNeish (1958: 64) to date from A.D. 1000 to A.D. 1350.

On a wider scale, this type was found at the Swan Lake site on the Winnipeg River in northwestern Ontario (Kenyon 1961: 35, Plate 10, No. 1) and Blackduck ware, although undifferentiated as to type, is reported from as far east as the Pic River site at the north end of Lake Superior (Wright 1963: 5). At the Pic River site the earliest stratum containing Blackduck ware was dated at A.D. 963 ± 80. Manitoba Horizontal also occurs at least as far south as central Minnesota (Wilford 1945: 314-15) and north to the Tailrace Bay site near the north end of Lake Winnipeg (Mayer-Oakes 1967: 359-60). To the west Manitoba Horizontal pottery was found at the Stott Mound and Village near Brandon, Manitoba and at site LAS 239 on the Bowsman River, near the town of Bowsman, Manitoba (Tamplin 1966: 9). The Stott Mound and Village is estimated to date from the middle of the 17th century (MacNeish 1954: 49).

Type 2: Stott Triangular (Plate 23b)

Paste, method of manufacture, vessel form and surface finish described under ware.

Reference: MacNeish 1958.

Sample: 3 rim sherds, at least 4 Class 6 (Cord-wrapped stick impressed) and an undetermined number of Class 2 (Cord-wrapped paddle impressed) body sherds.

Decoration: Four horizontal rows of sinew-wrapped stick impressions encircle the rim, above which are a series of nearly vertical impressions, spaced about 6 mm. apart, on the exterior edge of the lip. The impressions on the exterior of the lip were made with a blunt, smooth object which had been wound to within about 4.5 mm. of the end with cord or fine thong. A series of impressions, evidently made with the same instrument, were placed end to end along the lip. A single row of elliptical punctations, 11 mm. long and 4.5 mm. wide, also encircle the rim (Plate 23 b; Fig. 8 i).

Diagnostic Attributes

(1) Two or more horizontal bands of sinew-wrapped stick impressions encircling the rim.

(2) A series of short, nearly vertical impressions on the exterior edge of the lip.

(3) Elliptical punctations encircling the rim.

(4) Slightly outflaring rim with a flattened lip (Fig. 9 k).

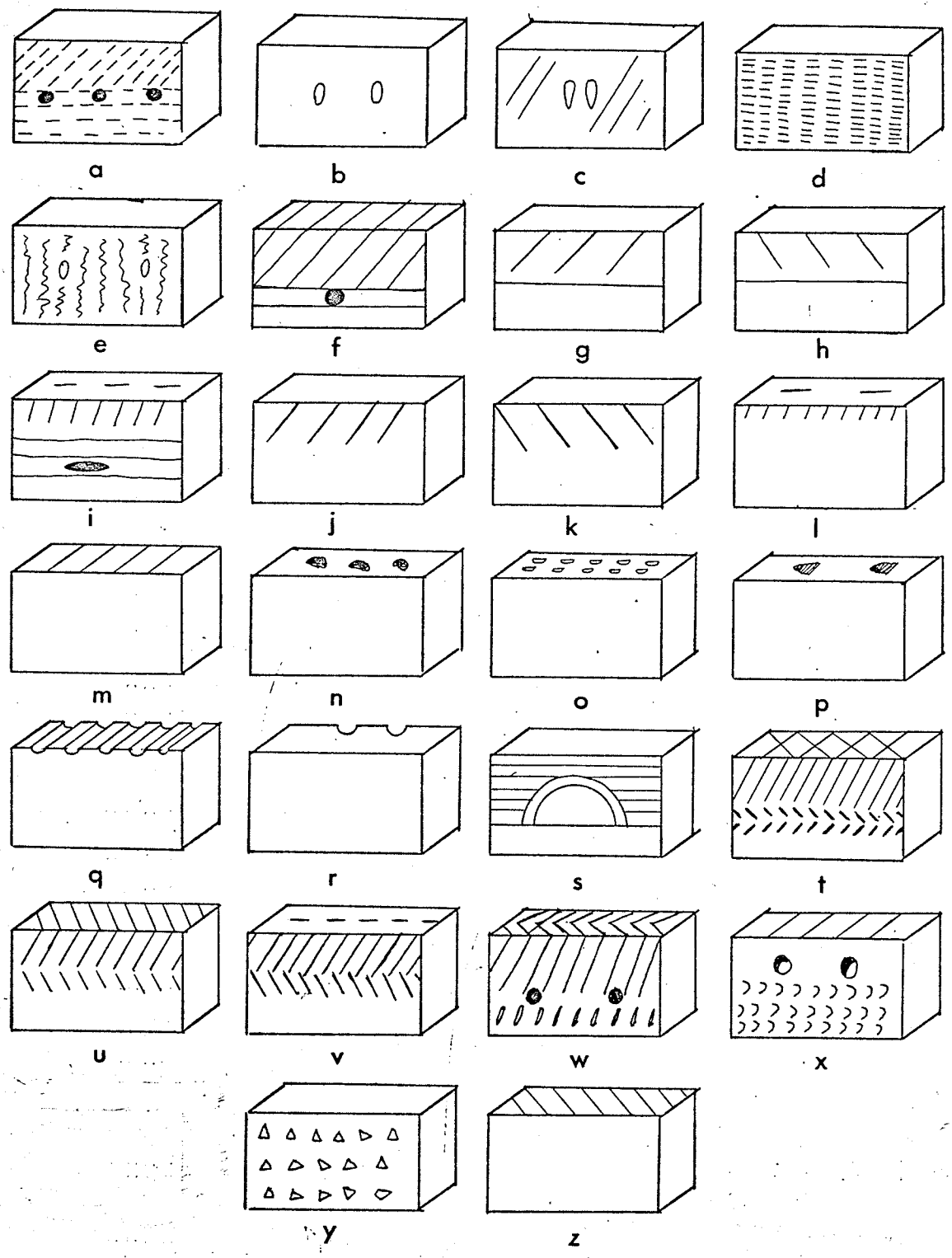


Figure 8. Modes of Rimsherd Decoration From the Avery Site.

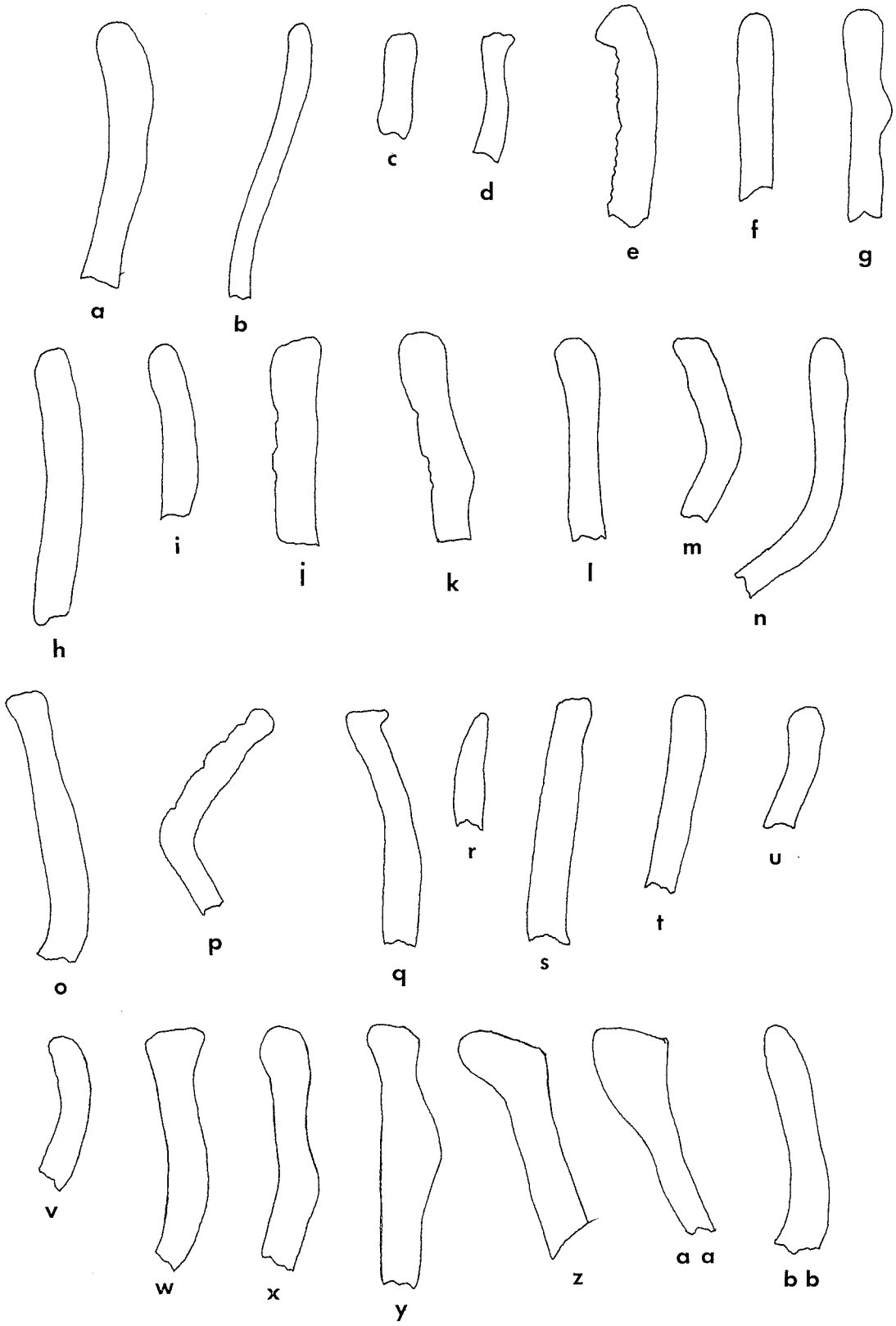


Figure 9. Rimsherd Profiles From the Avery Site (Interiors to the Right).

Temporal and Spatial Distribution: This type appears to be closely related to MacNeish's (1954: 35, 61) Stott Triangular type although the diagnostic triangular element was not visible on the Avery specimens. Except for this element, however, the other decorative modes of the Stott Triangular type--horizontal rows of sinew-wrapped stick impressions and the short, nearly vertical and well spaced impressions on the exterior of the lip -- are all present. Stott Triangular pottery has been reported only from the Stott Mound and Village (MacNeish 1954).

Type 3: Nett Lake Vertical Cord (Plate 23 c)

Paste, method of manufacture, vessel form and surface finish described under ware.

Reference: Evans 1961c.

Sample: 4 rim sherds, representing a minimum of two different vessels, and an undetermined number of body sherds, probably from Class 2 (Cord-wrapped paddle impressed).

Decoration: These sherds have no decoration except for a series of oblique cord-wrapped stick impressions placed between 6 mm. and 18 mm. apart along the exterior edge of the top of the rim. The design element runs either obliquely to the left (Fig. 8 j) or to the

right (Fig. 8 k) from the lip. The lips are plain.

Diagnostic Attributes:

(1) A series of widely spaced cord-wrapped stick impressions on the exterior edge of the top of the rim.

(2) Other decoration absent.

(3) Rims straight to slightly outflaring with flattened lips (Fig. 5 l).

Temporal and Spatial Distribution: Both in southeastern Manitoba and at the Stott Mound and Village, MacNeish (1958: 158-59; 1954: 34) described, under Manitoba Horizontal and Blackduck Brushed types, sherds decorated only with oblique rows of cord-wrapped stick impressions along the rim and lip. Since the only attributes these sherds share with Manitoba Horizontal and Blackduck Brushed types are the oblique cord-wrapped stick impressions on the rim and lip, it seems unjustifiable that they should be placed in the same type. Evans (1961c: 45) has recognized this as a separate type which he calls Nett Lake Vertical Cord. In Minnesota this type comprises 9% of the Blackduck sherds. Although there are no data available, this type appears to be consistently associated with the core Blackduck types such as Manitoba Horizontal.

WARE: WINNIPEG FABRIC IMPRESSED (Plate 23 d-i)

Sample: 60 rim sherds, representing at least 14 different vessels and 582 Class 4 (Fabric Impressed) body sherds.

Paste

Temper: Fine particles, mostly of quartz, ranging in size from barely visible up to about 2 mm. or larger in diameter.

Texture: Generally medium to fine. The sherds are compact with no tendency to split or crumble.

Color: Generally dark, ranging from brown (Munsell 10YR 5/3) to black. A few sherds are light yellowish brown (10 YR 6/4). The sherds are grey or brown in cross-section. Encrustations of carbon are common on the interior surfaces. Colors often very considerably on a single sherd.

Hardness: From 3 to about 4.5

Method of Manufacture: No coil breaks were observed suggesting that the paddle and anvil method of manufacture was employed. MacNeish (1958: 163) reached the same conclusions.

Vessel Form

Lip: Nearly always flattened and in about 54% of the cases markedly spread out and thicker than the rim

below (Fig. 9 m, o).

Rim: Straight and vertical to outflaring at an angle of about 30° (Fig. 9 m, o).

Neck: Necks are constricted, representing the right angle point of juncture between the body and rim.

Body: No data from the Avery site although MacNeish (1958: 166) describes vessels from southeastern Manitoba as having bodies with slightly angled shoulders and sub-conoidal bases.

Surface Finish: All of the sherds representing this ware have a fabric impressed surface finish. Although, in most cases the details of the fabric have been obliterated by smoothing, a few sherds appear to have been impressed with a fabric woven of weft elements, about 3 mm. in diameter twined over and under warp elements spaced about 5 mm. apart. In other cases, a knotted fabric composed of thin string may have been used. Some of the sherds may also have been impressed with a paddle wound with heavy cord up to 3 mm. in diameter.

Decoration: Generally absent except for tool impressions or punctations on the lip.

Component Type: Alexander Fabric Impressed

Type 1: Alexander Fabric Impressed (Plate 23 d-i)

Paste, method of manufacture, vessel form, and surface finish described under ware.

Reference: MacNeish 1958.

Sample: 60 rim sherds, representing a minimum of 14 different vessels, and 582 Class 4 (Fabric Impressed) body sherds.

Decoration: Unless the fabric impressions which covered the entire vessel can be considered a form of decoration, the shoulder and rim are undecorated, although seven different modes of decorating the lip were present (Fig. 8 l-r). Two decorative elements were made with a cord-wrapped stick (Fig. 8 l,m.), three consisted of punctations arranged in different sizes and patterns (Fig. 8 n-p) and two consisted of tool impressions on the top or inner edge of the lip (Fig. 8 q, r).

Diagnostic Attributes

(1) Decoration limited to the lip.

(2) Fabric impressed surface finish covering the entire vessel including the rim.

(3) Rims straight and vertical, or more commonly, outflaring with a flattened lip (Fig. 9 m-o).

Temporal and Spatial Distribution: Winnipeg Fabric-Impressed

ware was found in the upper three levels of the United Church site (MacNeish and Capes 1958: 144). Most of the sherds are identical to those from the Avery site. In southeastern Manitoba, Alexander Fabric-Impressed is the dominant ceramic type in the Selkirk phase estimated to date from about A.D. 1350. Fabric-impressed pottery of this, and related types, is particularly common in late prehistoric components of the Boreal Forest zone (Mayer-Oakes 1967: 353-59).

ABERRANT SHERDS

Group 1: Fort Yates Cord Impressed (Plate 24, a, b)

Reference: Wood and Woolworth 1964.

Sample: 8 rim sherds.

Paste:

Temper: Heavily tempered with particles of quartz, feldspar, mica and probably hornblende. The particles range from 0.5 to 1.5 mm. in size.

Texture: Coarse and crumbly.

Color: Greyish-brown (Munsell 2.5YR 5/2) to black. The sherds are of the same color in cross-section as on the surface.

Hardness: About 3.5.

Method of Manufacture: No coil breaks were observed and it is assumed that the vessel was made by the paddle and

anvil method.

Vessel Form

Lip: Rounded and smooth.

Rim: Outward flaring with a sharply insloping lip resulting in what is known as an S-shaped rim (Fig. 9 p). Rim height is about 28 mm. and the thickness is between 8 mm. and 10 mm.

Neck: No data from the Avery site but probably constricted (Wood and Woolworth 1964: 15).

Body: No data from the Avery site but probably globular (Wood and Woolworth 1964: 15).

Surface Finish: No data from the Avery site but descriptions of comparable Middle Missouri types indicate that the surface was probably plain or simple stamped (Wood and Woolworth 1964: 15).

Decoration: Five horizontal impressions, made with a clockwise twisted cord 2 mm. in diameter, encircle the rim. On two sherds part of a curvilinear "rainbow" motif is visible (Plate 24 a, b; Fig. 8 s). The lips are plain.

Temporal and Spatial Distribution: Fort Yates Cord Impressed is a common type in the Middle Missouri and Coalescent tradition sites of the Middle Missouri

region. It reached its peak of popularity about A.D. 1300 - 1400. This occurrence of Middle Missouri pottery in Manitoba is, by no means, unique. MacNeish (1958: 140, 171) reported one sherd of Mandan-like ware in level 5 of the Lockport site and suggested (1954: 36) that another from the Stott Mound and Village may be of Mandan origin. W. B. Nickerson found sherds of Middle Missouri pottery under Mound R. on Gainsborough Creek and at Elliot Village near South Antler Creek (Capes 1963: 24-25) and Vickers (1948c: 5; 1949b: 85) reports Middle Missouri pottery from the Lowton site about 20 miles northwest of Rock Lake.

Group 2: Paddle-Edge Impressed (Plate 24 c).

Reference: MacNeish 1958.

Sample: 7 rim sherds.

Paste

Temper: Particles of quartz and feldspar ranging in size from barely visible to about 1.5 mm. in diameter.

Texture: Coarse but fairly compact.

Color: Pale brown (Munsell 10YR 6/3) to black. The sherds are grey to black in cross-section.

Hardness: About 3.

Method of Manufacture: Unknown.

Vessel Form

Lip: Flattened, often with an overhang of clay on the interior or exterior edge (Fig 9 q).

Rim: Slightly outflaring (Fig 9 q). Thickness at the lip measures 6 mm. to 8 mm. and thickness below the lip from 5 mm. to 6 mm.

Neck: Unknown.

Body: Unknown.

Surface Finish: Unknown.

Decoration: The elements of the decoration resemble cord-wrapped stick impressions except that they are wider, deeper and more angular. These impressions are apparently similar to what MacNeish (1958: 167) calls "Cord-wrapped paddle-edge impressions". All of the sherds are decorated with a single row of these impressions, placed obliquely to the left, and spaced about 2 mm. apart, along the exterior edge of the lip. Five of the sherds have identical impressions on the interior edge of the lip as well. The largest sherd also has a series of elongated punctations placed in a herringbone design around the rim and criss-crossed cord-wrapped paddle-edge impressions on the lip (Plate 24 c; Fig. 8 t). Three sherds have a series of cord-wrapped paddle-edge impressions extending obliquely to the right below the upper row of

impressions creating a herringbone design (Fig. 8 u, v). One sherd has a row of nearly vertical paddle-edge impressions above a row of shallow, circular punctations and a row of vertical, elongated punctations (Fig. 8 w).

Temporal and Spatial Distribution: This group may be related to the Sturgeon Falls Fabric-Impressed or Manitoba Herringbone type found by MacNeish (1958: 167) in the Selkirk phase in southeastern Manitoba.

Group 3: Punctate (Plate 24 d, e)

Reference: MacNeish 1958.

Sample: 3 rim sherds, representing at least 2 different vessels. Nine of the Class 8 (Punctate) body sherds are also associated with this group.

Paste

Temper: Angular particles of crushed granite up to 3 mm. in diameter.

Texture: Very coarse with a tendency to crumble.

Color: One sherd is very pale brown (Munsell 10YR 7/4) and the other two are greyish brown (10YR 4/2).

Hardness: About 3.

Method of Manufacture: Two of the small sherds decorated with angular punctations have coil breaks suggesting

that this group may have been coil made.

Vessel Form:

Lip: The two small sherds with angular punctations have rounded and somewhat pointed lips (Fig. 9 r) and the sherd with the crescendic punctations has a flat lip beveled to the exterior (Fig. 9 s).

Rim: Straight (Fig. 9 r, s). The sherds with angular punctations are 5 mm. thick at the lip and about 7 mm. thick below the lip. The sherd with crescendic punctations is 7 mm. thick at the lip and 8 mm. to 9 mm. thick below the lip.

Neck: Unknown.

Body: Unknown.

Surface Finish: Unknown.

Decoration: The largest sherd is decorated with at least three horizontal rows of crescendic punctations. Above these are a single row of large punctations, 4.5 mm. by 8.5 mm. in diameter, made with a blunt, pointed object. The lip is decorated with a series of oblique tool impressions (Plate 24 d; Fig 8 x). One sherd from Class 8, probably a near rim sherd, is decorated with identical crescendic punctations (Plate 19 m). The two small sherds are decorated with a series of small, angular punctations 2 mm.

to 3 mm. in diameter (Plate 24 e; Fig. 8 y). Eight Class 8 body sherds (or near rim sherds) have the same type of punctations (Plate 19 l).

Temporal and Spatial Distribution: This group may be related to the Sturgeon Punctate type described by MacNeish (1958: 170) from the Selkirk phase in southeastern Manitoba. The Selkirk phase is estimated to date from about A.D. 1350.

Group 4: Plain (Plate 24 f-h)

Reference: None

Sample: 30 rim sherds.

Paste

Temper: Particles of crushed granite ranging in size from barely visible up to about 2 mm. in diameter.

Texture: Medium to coarse and generally fairly compact.

Color: Grey (Munsell 10YR 6/1), light yellowish brown (10YR 6/4) and black. Black is the most common color. The sherds are usually of the same color in cross-section as on the surface. Several sherds have encrustations of carbon on their interiors.

Hardness: About 3.

Method of Manufacture: No coil breaks were observed so perhaps the paddle and anvil method was used.

Vessel Form

Lip: Either flattened or rounded (Fig. 9 t, u).

Rim: Straight to outflaring (Fig. 9 t-v).

Neck: Unknown.

Body: Unknown.

Surface Finish: Unknown.

Decoration: The rims are plain and smooth. Six of the sherds have diagonal tool impressions on the lip and one has a series of small punctations. (Fig 8 n, z).

Temporal and Spatial Distribution: This group may include sherds from several different types, some perhaps with the surface finish obliterated by smoothing.

Group 5: Sand Tempered (Plate 25 a, b)

Reference: None.

Sample: 3 rim sherds from a single vessel.

Paste

Temper: Sand, mostly fine but with some particles up to 2 mm. in diameter.

Texture: Medium with no tendency to split or crumble.

Color: Light brown (Munsell 7.5YR 6/4).

Hardness: About 3.

Method of Manufacture: Unknown.

Vessel Form

Lip: Flattened and spread out from pressure applied to the upper surface.

Rim: Straight, probably rising vertically above a constricted neck (Fig. 9 w).

Neck: Probably constricted.

Body: Unknown.

Surface Finish: The rim is smoothed but a few irregular impressions near the base of the rim may represent fabric impressions.

Decoration: A double row of shallow, irregular punctations cover the lip. No other decoration is present.

Temporal and Spatial Distribution: The limitation of decoration to the lip, and the rim form, suggest that this group may be related to the Alexander Fabric-Impressed type. The smooth rim and the sand tempering, however, served to differentiate these sherds from others in the sample.

Group 6: Punctated and Cord-Impressed (Plate 25 c, d)

Reference: MacNeish 1958.

Sample: 2 sherds representing 2 different vessels.

Paste

Temper: Quartz, feldspar and mica ranging in size from

barely visible to about 3 mm. in diameter.

Texture: Coarse but fairly compact.

Color: Black, both on the surface and in cross-section. One sherd has an encrustation of carbon on its interior surface.

Hardness: About 3.

Method of Manufacture: Unknown.

Vessel Form

Lip: One is partially flattened, the other is rounded (Fig. 9 x, y).

Rim: Slightly outflaring (Fig. 9 x, y).

Neck: Unknown.

Body: Unknown.

Surface Finish: One sherd has been irregularly wound with cord, about 1 mm. in diameter and wound with a clockwise twist. The other is covered with criss-cross impressions not unlike a net. This cord was also about 1 mm. in diameter and wound with a clockwise twist.

Decoration: Both are decorated with punctations. One has punctations made with a blunt, pointed object (Plate 25 d) and the other has punctations made with a large, square-ended object (Plate 25 c).

Temporal and Spatial Distribution: These sherds resemble Lockport Plain pottery in rim form and in having large punctations for decoration.

Group 7: Castellated Sherds (Plate 25 e-h)

Reference: None.

Sample: 4 rim sherds.

Paste

Temper: Angular particles of quartz and feldspar up to 2 mm. in diameter.

Texture: Coarse but, except for one sherd, not crumbly.

Color: Pale brown (Munsell 10YR 6/3) to black. In cross-section the cores of the sherds are grey to black.

Hardness: Between 2 and 3.

Method of Manufacture: Unknown.

Vessel Form

Lip: One is rounded and rises to an abrupt point (Plate 25 g). The remaining three are flattened and very thick representing the raised tabs or castellations from vessel rims (Plate 25 e, f, h).

Rim: Either straight or outflaring (Fig. 9 z, aa, bb). Thickness for three of the specimens (Plate 25 e, f, h) is 12 mm. to 14 mm. at the lip and 6 mm. to 8 mm. below the lip. The fourth specimen (Plate 25 g) is 6 mm. thick at the lip and 8 mm. thick below the lip.

Neck: Unknown.

Body: Unknown.

Surface Finish: Two of the sherds are smooth (Plate 25 e, f) one is fabric impressed (Plate 25 g) and one is either fabric impressed or impressed with a paddle wound with very coarse cord (Plate 25 h).

Decoration: One sherd is decorated with a single large finger punctation on the lip at the apex of the castellation (Plate 25 e) and another has three oval finger punctations also on the lip at the apex of the castellation. The remaining two sherds are without decoration.

Temporal and Spatial Distribution: A sherd having similar elements was found in Mound R, along the Souris River in extreme southwestern Manitoba by W. B. Nickerson (Capes 1963: Plate 9, Nos. 11-12) and Vickers has collected a few castellated sherds from surface sites in the Melita locality (Chris Vickers, personal communication, 1968). Castellated pottery is apparently rare in other portions of Manitoba, however, it is not uncommon in the Middle Missouri region and the Manitoba specimens may be another indication of Middle Missouri influence in Manitoba.

TABLE 19

SUMMARY OF AVERY SITE CERAMICS

Ware	Type	No. Rim Sherds	Body Sherds
Winnipeg Fabric Impressed	Alexander Fabric Impressed	60	Class 4
Blackduck	Manitoba Horizontal	7	Classes 2 & 6
	Stott Triangular	3	
	Net Lake Vertical Cord	4	
Truman Plain Rim		16	Class 5
Avery Corded		31	Class 2
Laurel	Laurel Dentate	17	Class 1
	Lockport Plain	6	Class 1
	Lockport Linear	35	Class 3
Aberrant Sherds	Fort Yates Cord Impressed	8	
	Paddle-Edge Impressed	7	
	Punctate	3	
	Plain	30	
	Sand Tempered	3	
	Punctated and Cord Impressed	2	
	Castellated	4	

CHAPTER X

ARTIFACTS OF BONE AND ANTLER

Objects of bone and antler which had been fashioned into tools or otherwise worked were not abundant at the Avery site compared to the large number of bone fragments present. Only thirty-eight such artifacts were found, however, many of the sharp bone fragments which occurred as butchering refuse could easily have been used as tools without further modification.

The bone and antler artifacts were grouped into function classes in cases where they were similar to objects known from other archeological assemblages or from ethnographic sources. Several objects for which no function could be suggested were simply placed under a descriptive heading and their major features described. In artifacts belonging to the same function class, those made from different skeletal elements are considered separately.

Class 1: Awls (Plate 26 a-d)

Sample: 4

Description: Awls are defined as sharp, pointed tools with gradually tapering sides which were presumably used to perforate hides. Of the four awls found at the Avery site,

1 is made from a split section of rib bone, 1 from a long-bone splinter, 1 from the metapodial of a deer and 1 of antler.

The rib bone awl (Plate 26 a) has been ground to a fine point on one end and ground smooth along the lateral edges but is otherwise unmodified. The cancellous tissue of the rib marrow is still present on one side and the butt end appears to have been broken off. It measures 8 mm. wide at the widest point and 63 mm. long. Three other fragments of split rib bone were found which had been ground smooth along their lateral edges. These fragments may represent the midsections of rib bone awls.

The specimen made from a sharp splinter of longbone (Plate 26 b) is 90 mm. long and unmodified except for being ground to a sharp point on one end. The awl made from the metapodial of a deer (Plate 26 c) is 79 mm. in length and also unmodified except for being ground to a point on one end. The antler awl is 10 mm. wide at its broken end and 90 mm. in length, tapering to a finely ground point (Plate 26 d).

Class 2: Flaking Tools (Plate 26 e, f)

Sample: 2

Description: Tools similar to awls but thicker in cross-section and with a blunt tip were considered to be flaking tools or punches. Of two such tools recognized at

the Avery site, one consists of only the tip of an antler, 8 mm. in diameter and 44 mm. long (Plate 26 e), and the other is made of a short section of split rib , 63 mm. long and 17 mm. wide, tapering to a blunt point on one end (Plate 26 f).

Class 3: Spatulas (Plate 26 g-i)

Sample: 6

Description: These tools, usually referred to as either spatulas or quill flatteners (Lehmer 1954: 67), have aptly been described as "flat plates of bone shaped something like the contemporary physician's tongue depressor" (Lehmer 1966: 45). They are most often made from sections of rib bone, usually bison, and are smoothed and rounded on their ends and along the sides but with cancellous tissue still evident on what what was the inner side of the rib.

The function served by these objects is unknown. Besides being described as quill flatteners (Lehmer 1954: 67) it has been suggested that they were used in the manufacture and decoration of pottery (Wheeler 1956: 17-20) or to extract the marrow from bones (Kehoe 1967: 59).

Of the six spatulas found at the Avery site, 4 were made of split rib bone and 2 were made of longbone splinters. The rib bone spatulas, except for one nearly complete specimen, consist of only the broken ends of spatulas, 31 to 48 mm. in length (Plate 26 g, h). The nearly complete

specimen (Plate 26 i) is broken near the tip of one end. It is 142 mm. long and 20 mm. wide and is worn to a high polish over its entire surface. All of the rib bone spatulas have cancellous tissue remaining on what was the interior of the rib.

The spatulas made from longbone splinters are represented by the ends of broken specimens. These tend to be wider (both 37 mm.) and more curved in cross-section than those made made rib bone. Also, unlike the rib bone spatulas, these have rough edges; only one side of one specimen has been ground smooth.

Class 4: End Scraper Handles (Plate 27 a, b, f)

Sample: 6

Description: Handles for end scrapers were made from sections of rib bones cut square on one end and with a slot cut into the marrow to hold the base of an end scraper.

All of the Avery specimens had been made by cutting a groove around the circumference of the rib and snapping off the unwanted portion forming a square end into which the base of an end scraper could be fitted.

The largest handle (Plate 27 f) is 172 mm. long, 25 mm. wide on one end and 17 mm. wide at the opposite end. The smallest specimen is 84 mm. long and 15 mm. wide. Two of the handles have been finished so that end scrapers could be

inserted into both ends. Three of the handles are broken or cracked at their ends on the inner curve of the rib indicating that the end scrapers were inserted with the working edge opposite to the inner side of the rib, that is, so that during use, pressure would be applied with the curve of the rib (Fig. 10).

Class 5: Fleshing Tools (Plate 27 c, Plate 29)

Sample: 2

Description: One complete specimen found at the Avery site is made from the right proximal metatarsal of an elk. The anterior surface has been cut, or more aptly chopped, about a third of the way through and split toward the distal end where it was ground to a sharp edge from both surfaces. The working edge appears to have been serrated. The entire surface, except for the proximal articulation, has been highly polished. The total length is 24 cm. and the width of the working edge is 23 mm. (Plate 29).

The second specimen is only a fragment of a fleshing tool which had been broken from the shaft and split longitudinally. Three serrations appear on the working edge (Plate 27 c).

The manufacture and use of longbone fleshing tools is well documented in ethnographic literature (Steinbring 1966). These were heavy-duty implements used to remove

the excess tissue from the inner side of green hides. Such tools are commonly found in archeological contexts, occurring locally at the Stott and Lockport sites (MacNeish 1954: 44; 1958: 135-36) associated with Manitoba and Selkirk phase materials.

Class 6: Knives (Plate 27 d, e)

Sample: 5

Description: Knives are defined as sections of bone which had been ground to a sharp cutting edge. Some of the items placed in this category less than perfectly fulfilled this criterion but were included since they represented isolated examples. Of the knives found at the Avery site, two are made from scapula splinters, one from a longbone splinter and two from rib bones.

Of the scapula splinter knives, one is broken and shows only a portion of a beveled cutting edge. The other is a long splinter, 86 mm. long, 15 mm. wide at the blunt end and tapering to a ground and polished end which forms a short cutting edge and a sharp point (Plate 27 e).

The longbone splinter knives are sharp fragments of bone with little or no grinding evident, however, they appear to have acquired a degree of polish probably as a result of being used as cutting implements (Plate 27 d). One of the rib bone knives is fragmentary and the other is shaped like a conventional iron knife blade with the

edge ground to a thick and not too effective edge.

Class 7: Barbed Points (Plate 28 a-d)

Sample: 4

Description: Unilaterally barbed points, much like those from the Avery site were found at the Stott and Lockport sites and at Rosser Mound (MacNeish 1954: 43; 1958: 136) and were thought to represent fish spears. The barbed points from the Avery site are made of split rib bones. One specimen is complete except for the tip which has been broken off just behind the first barb (Plate 28 a). The length is 54.5 mm. the maximum width is 19 mm. and the width of the stem is 12 mm.

Three of the specimens are fragmentary. One consists of only a tip with one small barb present on the blade (Plate 28 b). The second specimen is the base of a point, 19 mm. wide and 66 mm. long, ground smooth along the sides and broken just above the barb (Plate 28 c). The third specimen may represent the midsection of a point with a broad notch placed on one edge (Plate 28 d).

Class 8: Cut Metapodials (Plate 28 e-h)

Sample: 6

Description: The distal ends of two bison metacarpi were found which had been cut across their posterior sides near the large foramina and removed from the

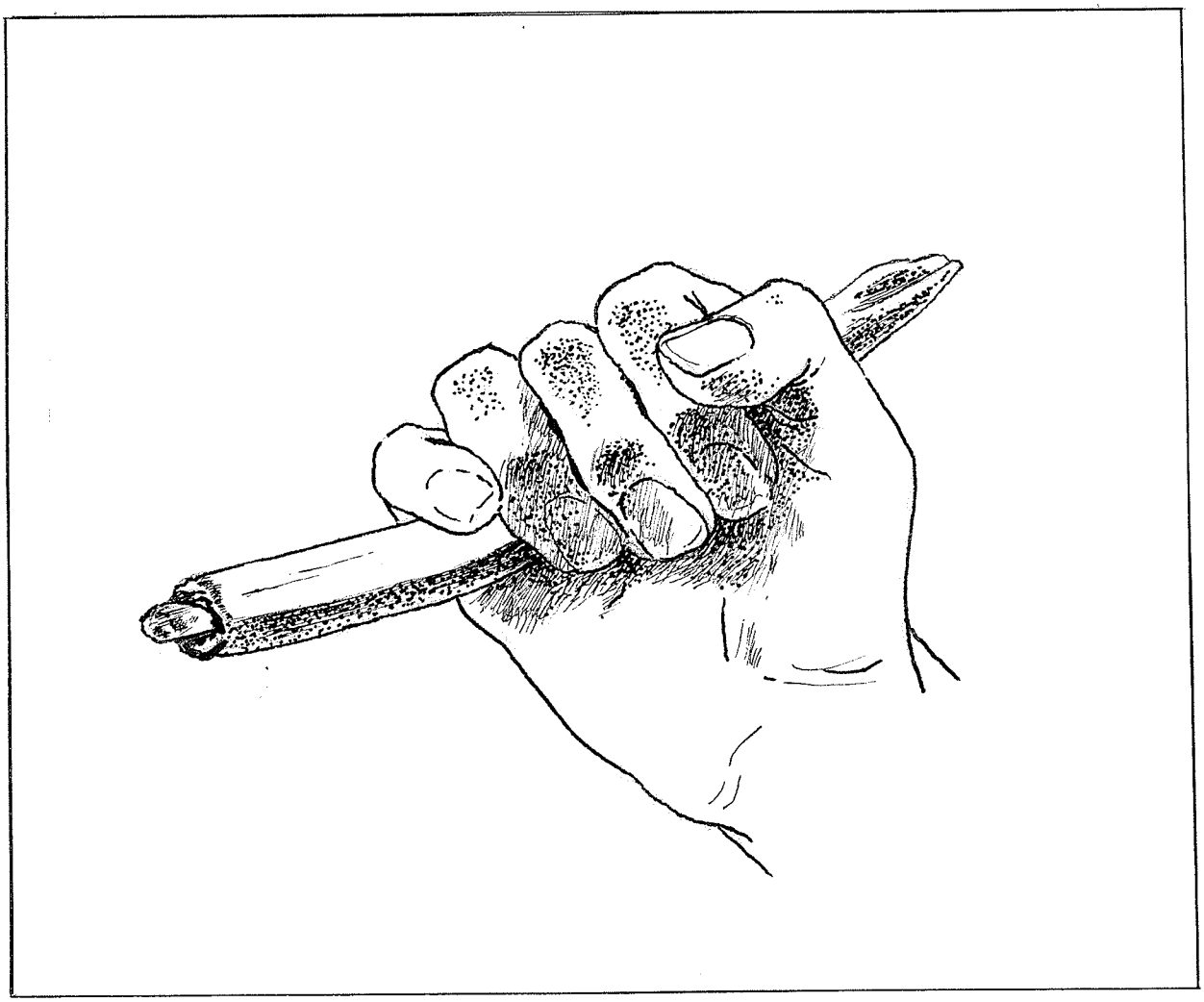


Figure 10. Suggested Manner of Using
End Scraper Handles.

shaft by a blow on their posterior sides. The result was a transverse break up the shaft of the bone (Plate 27 e). The distal metapodial of a large animal, tentatively identified as an elk, had been similarly cut and broken. This technique of removing the articulating ends of the bone may have been a preliminary step in the manufacture of metapodial fleshers.

The metapodial of a canid had been partially encircled with a groove near the proximal end of the shaft (Plate 28 f) and the distal end and midsection of another had been similarly grooved and broken off, probably in the manufacture of bone tubes or beads.

Class 9: Beaming Tool (Plate 27 g)

Sample: 1

Description: The rib of a large animal, probably a bison, has a large concavity worn in the posterior edge. The sternal end is irregular and crushed as if it had been chewed by dogs and there is a sharp break at the ventral end, just above the concavity. This tool may have been used in working hides.

Class 10: Beaver Tooth Gouge (Plate 28 j)

Sample: 1

Description: A split beaver tooth shows light wear along one side of the biting surface. The fact that the

wear is on a broken surface indicates that it did not occur naturally. The worn surface is also on the left side which is exactly what would result if the tooth, while being used as a cutting instrument, were held in the right hand and drawn inward, toward the body, with the curve of the tooth.

Class 11: Cut Antler (Plate 28 i)

Sample: 1

Description: The tip of an antler prong, 32 mm. long, had been encircled with a groove about 2 mm. deep and snapped off of the shaft. No function is known for this specimen.

CHAPTER XI

MISCELLANEOUS ARTIFACTS

Several artifacts or pseudo-artifacts which were found at the Avery site by Vickers and the 1966 field crew did not fit under any of the previous headings and, for the sake of convenience, are described here.

Pipe Fragment (Plate 30 h). One fragment from the bowl of a catlinite pipe is 1.2 mm. thick at the rim and 19.7 mm. in height. The complete bowl would have been about 20 mm. in diameter at the lip. Both the interior and exterior surfaces of the bowl are covered with very fine, vertical striations, evidently the result of working the stone. The exterior has been polished somewhat, obliterating the striations. The interior is stained charcoal grey, probably as a result of the pipe being used.

Large Point or Biface (Plate 30 i). This specimen may have served either as a large projectile point or a cutting tool. It has one slightly concave edge and one slightly convex edge, deeper corner notches, slightly barbed shoulders and a straight base. Basal grinding is present and the artifact is made of chert. The metrical attributes are given in Table 20.

TABLE 20

LARGE POINT OR BIFACE: METRICAL ATTRIBUTES

Dimension	Value
Length (mm)	61.5
Body Width (mm)	40.1
Thickness (mm)	8.0
Base Width (mm)	29.4
Neck Width (mm)	24.0
Notch Width (mm)	8.7
Basal Form (mm)	0
Weight (gm)	6.7
Length/Width	1.5
Width/Thickness	5.1

Shale Disks (Plate 30 a-g). Thirty-five circular shale disks were found which had a series of small grooves around the edges on both surfaces. These were originally thought to be worked to form a scraping or abrading tool, however, I became increasingly skeptical when attempts to reproduce these grooves on similar shale pebbles proved virtually impossible. It was finally observed that freshly split shale pebbles often showed the beginnings of unmistakably identical grooves. This indicated that the grooves were a result of the unusual natural cleavage patterns of this type of shale rather than the result of human agency.

Although pebbles of grey shale are common in the calcareous till of the Rock Lake locality, those with such an unusual pattern of fracturing are not common. They do occur in archeological sites in the locality, however, suggesting that they may have been collected, for some reason, by the occupants of these sites (Chris Vickers, personal communication, 1967). MacNeish and Capes (1958: 132-33) found three grooved shale disks at the United Church site which they describe in the report as "rubbing stones".

Water-Worn Pebbles. Ten smooth, water-worn pebbles were found at the site which range in size from 8.5 mm. to 44 mm. in maximum diameter. Four of these are of quartzite,

2 are of reddish translucent quartz, 1 is of limestone with a small, naturally occurring hole through one end, 1 is a small ironstone concretion and 2 consist of a dark material criss-crossed with veins of quartz. The significance of these specimens is that they do not occur naturally on the higher terraces of Rock Lake and were probably carried to the site from the lake shore. None of the pebbles were worked.

Mica. Four small sheets of mica (Muscovite), about the size of a 25¢ piece, were found at the site. Sheets of mica do not occur naturally in soil and the specimens must have been brought to the site from elsewhere. None showed signs of being worked.

Hematite. Twelve small lumps of reddish hematite were found which probably served as a source of pigment.

CHAPTER XII

THE FAUNAL REMAINS

Nineteen thousand two hundred bones and bone fragments were recovered in the 1966 excavations at the Avery site. In addition to these, Vickers saved 320 bones from his 1944-48 excavations making a total of 19,520 specimens of bone collected from the site.

An analysis of the faunal remains from the Avery site was undertaken with the objectives of determining whether changes have taken place in the environment of southwestern Manitoba and how the prehistoric inhabitants of the Avery site utilized the environment in terms of diet, hunting patterns, season of occupation and butchering techniques.

All bone material encountered in the 1966 excavations, including the unidentifiable fragments, were saved and catalogued according to excavation unit and level. The bone, although highly fragmented, was equally well preserved in all of the excavation units.

The sample of bone collected by Vickers consisted of only worked, unusual, or clearly identifiable specimens, however, the sampling bias introduced as a result was probably small since Vickers' collection of bone was small

and a large number of bones originally discarded were collected from a trench (Unit 49E8S) dug through a portion of Vickers' former Excavation 1.

The faunal remains from each excavation unit and each level were extremely homogeneous in species composition and degree of fragmentation indicating that the sample collected is likely an accurate representation of conditions existing in the unexcavated portions of the site as well.

The bone material from each level of each excavation unit was studied separately in the hope that changes in the frequency occurrence of species in the different levels of the site could be detected. It became apparent, however, when the analysis was completed, that no such stratigraphic differences were present and the sample could best be treated for the site as a whole. The results presented here are therefore based upon the entire bone sample without regard to vertical or horizontal location within the site.

Each specimen of bone from the site was examined and, in each case where it was possible, the skeletal element and species were determined. Species identifications were made by comparing the specimens to identified skeletal materials along with reference to relevant works on comparative osteology (Cornwall 1956; Lawrence 1951; Olsen 1950, 1964) and a standard anatomical work (Sisson and Grossman 1953). No element was considered identified

unless it could be matched in all relevant morphological features to an identified referent specimen.

In cases where sufficient comparative skeletal material was unavailable, or when adequate published material could not be found dealing with the distinguishing skeletal features of closely related species the specimens were submitted to a specialist. In cases where adequate comparative Bison material was unavailable, elements of Bos were substituted with special considerations given to the distinguishing characteristics of the two genera. This was considered a justifiable strategy considering that "the distinguishing differences between the skeletons of Bison and Bos . . . are so subtle that only a combination of these characters make certain bones identifiable and separable" (Olsen 1960: 3).

Due to the highly comminuted condition of the bone, less than 5% of the total sample could be positively identified to the species level. In cases where the skeletal element could be determined but could not be confidently assigned to a species, the element was listed with a note designating the most probable species to which the specimen belonged. This was done as an aid in attempting to reconstruct the butchering techniques used on the larger mammals represented at the site.

Only positively identified elements were used in

tabulating the totals for each species. Right and left elements were noted wherever possible. The minimum number of individuals represented by each species was determined by simply counting the single most abundant skeletal element. In this study I have followed the osteological nomenclature used by Sisson and Grossman (1953) rather than the older systems of terminology drawn from human anatomy.

The fragmentary condition of the bone, in which only the small, dense skeletal elements such as the carpals, tarsals and phalanges were complete created several problems in analyzing the material. Division of the sample into meaningful size categories was difficult because the long-bones, which are the most useful in determining size ranges within a species, were in no instance complete, and in most cases pulverized into fragments.

Specimens identified as belonging to the family Canidae were simply listed as being closest to the fox, coyote, dog or wolf in size. Since there is a considerable variation in the size of domestic canids "dog sized" was defined as being between a coyote and wolf in size. Fusion of the epiphyses and the degree of tooth eruption and wear were noted on specimens where these features were present. However, because most of the canid remains consisted of phalanges, metapodials and rib fragments, stages of maturity

could rarely be determined. When it could not be determined whether a bone represented a mature or immature individual it was, for the sake of consistency, presumed to be mature and noted to be closest in size to the fox, coyote, dog or wolf.

The bison remains were more difficult to classify according to size since the only complete skeletal elements were the small, dense bones of the carpus, tarsus and phalanx and there is little published data dealing with the size variations of the post-cranial elements of modern bison. Bones from mature and immature individuals were separated on the basis of closure of the epipyses and degree of tooth wear.

Teeth were much easier to classify according to states of maturity than were the fragmentary post-cranial elements. The teeth were recorded as either immature, adolescent, mature or old, according to the system of wear classification devised by Skinner and Kaisen (1947: 143-46).

The Vertebrate Fauna

Of the 19,520 bones and bone fragment found at the site, the overwhelming majority, 19,340 specimens or 99.0% were mammal bones. Of the remainder, 135 (0.7%) were fish bones, 31 (0.2%) were amphibian remains and only 5 (0.1%) were bird bones.

Mammals

Twelve species of mammals, excluding man, were represented in the bone material from the Avery site. Only two species, the bison and the dog, were represented by enough bones to indicate the presence of more than a minimum of three individuals of each species. The bison and dog remains together comprised more than 80% of the identified mammal bone making the occurrence of each of the other ten species almost incidental.

Clearly the single most important species at the site was the bison (*Bison bison*). Over 65% of all the identified bone from the site belonged to the bison and nearly all of the unidentifiable bone fragments, considering their size and general configuration, were almost certainly derived from the bison as well.

An analysis of the bison teeth revealed that a minimum of 22 individual bison were represented in the sample while a minimum of 18 individuals were represented by the post-cranial elements (Table 21). The minimum number of individuals represented by the teeth was determined by counting the most abundant single element, usually one of the lower molars, in each of the age groups established. In the post-cranial skeleton, the most abundant element was the left 2-3 carpal. Considering the likelihood of a sampling error, the agreement between the number of

TABLE 21

AGE GROUPS OF BISON REPRESENTED AT THE AVERY SITE BY TEETH AND POST-CRANIAL ELEMENTS

Age Groups	% of Total Teeth	% of Total Post-Cranial Elements Determined by Fusion of Epiphyses
Immature	18.0	17.8
Adolescent	27.0	35.6
Mature	45.0	46.6
Old Age	10.0	

individuals represented by post-cranial elements and those represented by teeth was considered to be very good.

Eight of the left 2-3 carpals were considered to be large mature and the remaining 10 were classified as small mature. The problem in separating carpals into groups on the basis of size and maturity is that there are no objective criteria by which to separate the immature from the mature elements, thus while it is tempting to say that the 8 left 2-3 carpals classified as small mature on the basis of size represent adult females and those in the large mature category represent adult males, it is equally likely that several of the specimens merely represent individuals of late adolescent age (See Appendix D).

The age categories I have used (Table 15) generally follow those employed by Skinner and Kaisen (1947: 143-45) and Kehoe (1967: 67-68). Some modification was necessary, however, and resulted in the creation of somewhat broader categories. This was the result, first, of having large numbers of isolated teeth which make aging on the basis of tooth wear less precise than would have been possible with complete maillas and mandibles, and second, of having no complete longbones and not a great many undamaged articulating ends. The categories I have used, their criteria and approximate equivalence in terms of years are as follows:

Immaturity -- Foetal stage to eruption of the third molars, fusion of the epiphyses of the first and second phalanges and partial union of the epiphyses of the longbones. In terms of age equivalence this represents the foetal stage to about two years.

Adolescence -- Eruption of the third molars and partial fusion of the longbone epiphyses to the beginning of wear on the style of the second molar and closure of the epiphyses of the longbones. From the second to the fourth year of age.

Maturity -- Beginning of wear on the style of the second molar and on the heel of the third molar until the styles of the molars begin to disappear. From the fourth to the twelfth or fifteenth year.

Old Age -- Teeth worn to the roots, styles of the molars worn away and the fossettes of the teeth beginning to disappear. Beyond twelve or fifteen years of age.

The percentage of immature, adolescent, mature and old bison which occurred at the site represent what would have been a normal distribution of age groups within a herd during most seasons of the year. The immature category, however, was conspicuous by its near absence of foetal and newborn calves only a few bones of young calves were present suggesting that most of the bison were killed in the late fall or early winter. Only two or three bones were identified as belonging to young calves. Bison mate in early August and calves are dropped in May after a ten-month gestation period. If the bison were killed in the spring or summer the bones of very young individuals should have been present. Other factors, however, may have been in operation. Selective killing could have been practiced or foetuses and/or young calves could have been butchered in a separate area of the camp. If, however, the sample is an unbiased one most of the bison could not have been killed in the spring or early summer.

If bison bone was equally distributed throughout the entire area (bone concentration was fairly uniform in the squares excavated at opposite ends of the site) then as many as 800 bison may have been butchered in the site area. This figure is based on the minimum of 9 individuals represented in 7 of the 2 meter squares excavated in 1966. This estimate may be conservative compared to the total

number of bison which may have been slain in the locality, considering the amount of bone debris observed in the surrounding locality.

Next to the bison, dogs (Canis familiaris) were the most abundant species at the site. Although it is virtually impossible to distinguish dogs from wolves or coyotes on the basis of fragmentary skeletal material, all of the bones identified as C. familiaris were well within the size range of aboriginal domestic dogs. All but one or two specimens appeared to be fully mature and none appeared to be of advanced age. The permanent teeth were present in the mandibles but showed little or no wear and the epiphyses were sealed on the limb bones. All of the canid bones were large and a variety of different skeletal elements were represented. Only mandibles, vertebrae, metapodials and phalanges occurred unbroken. Twelve bone fragments were clearly of wolf size and represent at least one individual.

Elk (Cervis canadensis) were represented by two fragmentary antler tines and a worked distal metatarsal (p. 160). A single antler tip (p. 165) may represent either an elk or deer (Odocoileus sp.). The only deer bone was a worked vestigial metatarsal (p. 157).

Two maxilla fragments and one canine tooth, probably all from the same individual, were from a mature black bear (Ursus americanus). Bears were found throughout

southern Manitoba before settlement and localities such as the Pembina Valley undoubtedly provided an excellent habitat.

Beaver (Castor canadensis) were represented by seven teeth representing a minimum of one individual. This seems unusual since if they were used as food post-cranial elements and especially the rather massive maxilla and mandible should have been present. At any rate, beaver were probably abundant in the locality and the lack of other skeletal parts is unexplained.

Rabbits, Lepus cf. americanus, were represented by mandibles and post-cranial elements. Although occurring in periodically fluctuating populations, rabbits were one of the most abundant small mammals in the aspen parkland.

Ground squirrels, probably Citellus franklini, pocket gophers (Thomomys talpoides) and the chipmunk (Eutamias cf. minimus) were all represented at the site. Each of these species are still abundant in the locality. Much of the burrowing activity evidenced at the site was probably the work of these animals.

The distal humerus of a bobcat (Lynx rufus) was the only indication of this species. Bobcats feed on small mammals and birds and probably occurred regularly in the locality.

The badger (Taxidea taxus) was represented by a single

mandible fragment. The badger depends upon small rodents for its food, but unlike the bobcat, lives on the open grassland.

The single human bone (Homo sapiens) in the faunal assemblage consists of the symphyseal portion of a mandible which had been broken immediately anterior of the mental foramina with the break passing through the sockets of the second premolars. The mandible was apparently fractured by a blow after the body had decomposed since the edges of the break are sharp and jagged.

The mandible fragment exhibits a square chin with the mental protuberance and mental tubercles well developed. The superior and inferior genial tubercles are also well developed with moderately deep digastric fossae. The height of the symphysis is 43 mm.

Only two teeth remain; the left canine and the left first molar. The canine has been damaged making it impossible to determine what its original condition might have been, however, the premolar shows only a moderate degree of attrition. The sockets of the four incisors, the right canine and the first premolar are open and well defined indicating postmortem loss of teeth. The superior border of the alveolar portion of the mandible is notably irregular although this is partially the result of mostmortem damage. The stages of eruption and wear of the teeth suggest

TABLE 22

SUMMARY OF THE AVERY SITE FAUNA

Class	Species	Min. No. of Individuals	% Id. Bone
Mammals	Bison *Bison bison*	22	64.9
	Dog *Canis familiaris*	9	17.9
	Wolf *Canis lupus*	1	0.9
	Rabbit *Lepus* sp.	3	0.6
	Beaver *Castor canadensis*	1	0.6
	Elk *Cervis Canadensis*	1	0.3
	Deer *Odocoileus sp.*	1	.08
	Black bear *Ursus americanus*	1	0.2
	Pocket gopher *Thomomys talpoides*	2	0.3
	Chipmunk *Eutamias sp.*	1	.08
	Bobcat *Lynx rufus*	1	.08
	Badger *Taxidea taxus*	1	.08

TABLE 22--Continued

Class	Species	Min. No. of Individuals	% Id. Bone
Mammals	Ground squirrel *Citellus* sp.	1	.08
	Man *Homo sapiens*	1	.08
Fish	Northern Pike[2] *Esox lucius*	2-3	10.6
	White Sucker *Catostomus commersonii*	1	0.2
Birds	Species unknown	3	0.4
Amphibian	Toad *Bufo* sp.	3	2.5

[2]The bones identified as "probably" northern pike are included in the percentage given here.

that the mandible belonged to a mature individual.

Fish

The presence of only two species were determined from the 135 fish bones found at the Avery site. These were the Northern Pike (*Esox lucius*) and the White Sucker (*Catostomus commersoni*). All of the fish bones were in a good state of preservation; only a few bones were broken and none showed signs of being worked. With the exception of a left dentary, a fragmentary pre-operculum and part of a basi-occipital, all from Northern Pike, all of the fish bone consisted of vertebrae. Since these are the most difficult elements of the fish skeleton to identify only 12.5% of the bones could positively be identified to the species level.

By far the most abundant species represented in the collection was the Northern Pike which was represented by 11.1% of the total fish bone. In addition, 67.4% of the bones were identified as probably, but not positively, belonging to the Northern Pike. The only other species now known from Rock Lake are the yellow perch (*Perca flavescens*), the brown bullhead (*Ictalurus nebulosus*) and the white sucker. The perch was recently introduced and the bullhead may have increased in recent times due to erosian and subsequent increased turbidity of the water. Considering the few species known from Rock Lake it seems

probably that most of the bones identified as "probably" Northern Pike do, in fact, belong to that species. If this is the case it would bring the bones of the Northern Pike to a maximum of 78.5% of the total fish bone.

The largest Northern Pike vertebrae indicated an individual weighing 5 or 6 pounds (E. J. Crossman, personal communication, 1967); nowhere near the maximum of 35 pounds or more recorded for the species but one which would presently qualify as a larger than average catch in Rock Lake.

The Northern Pike is still abundant throughout Manitoba. The species is a voracious and indiscriminate eater which will take either natural or artificial bait and can readily be taken by spearing through a hole in the ice. The Northern Pike ascends small streams in the early spring to spawn.

The White Sucker, which was represented by only 1.5% of the fish bones, is a bottom scavanger which rarely exceeds 8 pounds in weight. Suckers, which form an important element in the diet of Northern Pike, are also often speared as they ascend small streams in the early spring to spawn.

The apparent absence of bones of the skull, mandible, operculum and pectoral girdle is not necessarily significant when one considers that the total number of bones recovered from the site need not represent more than

three or four individual fish. On the other hand, it seems likely that a larger number of fish were present than can be minimally calculated from the remains.

A possible explanation of the lack of cranial elements is that the heads of the fish were removed outside of the main area of occupation, perhaps at the lake, and the body containing the vertebral column brought back to camp. The fractured basi-occipital of a Northern Pike was found which might indicate that the fish were, in fact, decapitated. It is also likely that the fish heads, wherever they were discarded, would have been eaten by dogs.

Amphibians

The only amphibian remains found at the site were those of three toads (*Bufo* sp.) including the nearly complete skeleton of a mature individual, two humeri and the tibio-fibular of another, and the humerus of a smaller, probably immature specimen. Although the species to which the remains belong could not be determined they are likely that of *Bufo hemiophrys*, the Canadian toad, which occurs near lakes and streams from Manitoba west to the Rocky Mountains.

All of the toad bones were found in the same location, between 50 and 60 centimeters below the surface, in what was apparently a former rodent burrow. The mandible of a ground squirrel was also found in association with the bones. Considering their location and the fact that the bones were

not scattered or broken it is probable that at least the most complete specimen died a natural death in the rodent burrow. The Franklin's ground squirrel has been known to prey upon toads and other small animals (Sowls 1948: 124), a fact which could explain the presence of toad remains in a rodent burrow.

Considering the foregoing data, it seems highly improbable that the presence of the toads bore any relationship to the human occupation of the Avery site.

Birds

Only five bird bones were found at the Avery site, none of which could be identified to the species level. Two of the bones are ulnas, one large fragment from a bird about the size of a Great Horned Owl and the other probably from a duck. Two bones, a femur and a tibia, represented a bird about the size of a large grouse. The fifth bone is a small metatarsus.

The Invertebrate Fauna

Twenty-six mollusk shell fragments were found in the excavations. The preservation of the specimens varied from poor, with some fragments tending to crumble and flake, to good, with a few examples retaining portions of the outer calcium carbonate layer. All of the fragments were small and, although some appear to have separated along the growth

lines because of natural disintegration, several were clearly broken by blows originating both on the inner and outer sides of the shell. None were intentionally broken however.

Because of the small size of the specimens and their often poor state of preservation, identification of species was generally impossible. Dr. Alan Cvancara of the Department of Geology at the University of North Dakota, examined the collection and was able to make several tentative identifications. The identified species are as follows (each species is represented by only one fragment).

Class Pelecypoda

Order Prionodesmacea

Family Unionidae

1. *Amblema costata*
2. *Ligumia recta latissima*
3. *Lampsilis ventricosa* possibly *L. siliquoidea*
4. *Anodonta* sp. or *Anodontoides* sp., cf. *A. grandis*

Amblema costata. This is a freshwater species found in the Red River and its larger tributaries. It has not been reported from the Pembina River (Cvancara 1967: 189). It occurs on mud, or especially, sand or gravel bottoms in water usually not more than 1 meter in depth (Baker 1928: 82).

Ligumia recta latissima. A freshwater species found in the Red River and its larger tributaries but also not reported from the Pembina River (Cvancara 1967: 189). Frequently found in water up to 6 meters in depth where there is a gravel bottom and swift current (Baker 1928:259).

Lampsilis ventricosa, possibly L. siliquoidea. Both are freshwater species found in the Red River, however, L. ventricosa has recently been reported from only the larger tributaries in the Red River drainage while L. siliquoidea occurs throughout the drainage including the Pembina River (Cvancara 1967: 189). L. ventricosa is most common on sand and gravel bottoms in water up to 4 meters deep while L. siliquoidea prefers mud bottoms in quiet water up to 6 meters deep (Baker 1928: 273, 284).

Anodonta sp. or Anodontoides sp., cf. A. grandis. Both freshwater genera presently inhabit the smaller tributaries of the Red River including the Pembina River. Both also prefer lakes, ponds and small streams. A. grandis is reported from sandy-mud bottoms in water up to 2 meters in depth (Baker 1928: 152-69, 175-82).

In addition to the Pelecypods discussed above, one gastropod was found which may be of marine origin. The specimen is quite thick and has a series of inconspicuous nodes encircling the exterior. Curiously, the ventral

surface has been ground flat and smooth. Cvancara (personal communication, 1968) suggests, on the basis of nearly identical specimens recently excavated in eastern North Dakota, that this may be of fossil origin. The North Dakota fossils were also ground on the ventral surface.

Conclusions. All of the shells, except for the single gastropod, are freshwater species presently found in Manitoba. On the basis of the present-day distribution of mussels in the Red River drainage, some of the shell material found at the Avery site was probably not present in the locality and would have been brought from the Red or Assiniboine Rivers. Most, then, would not have been used for food but for the manufacture of tools or ornamental or ceremonial objects. No such objects were found, however.

Cvancara (personal communication, 1968) also mentioned the possibility of the shells being fossil specimens. These would have come from the river terrace sediments and would date from early post-glacial times when the Pembina River had a greater discharge than at present.

CHAPTER XIII

FLORAL REMAINS

Plant remains were rare at the Avery site. The only specimens found, other than ash and small flecks of charcoal, were three lumps of wood charcoal and a number of hazelnut and chokecherry seeds.

The three specimens of wood charcoal were submitted to the Forest Products Laboratory, Ottawa, where they were identified as follows:

1. Oak (*Quercus* sp.)
2. Coniferous, probably Larch (*Larix* sp.) or Spruce (*Picea* sp.)
3. Poplar (*Populus* sp.)

The oak, no doubt, represents the Bur oak (*Quercus macrocarpa*). This is the only species of oak found in southern Manitoba and it is common along the Pembina River and at Rock Lake. The poplar is either the trembling aspen (*Populus tremuloides*) or the Balsam poplar (*P. balsamifera*). Both are common in the Rock Lake locality.

The coniferous charcoal was unexpected, however, since no coniferous trees now grow at Rock Lake. The only species of larch found in Manitoba is the tamarack (*Larix laricina*)

but both the black spruce and the white spruce (*Picea mariana* and *P. glauca*) are common. All of these species are now chiefly restricted to central and northern Manitoba, however, a pollen diagram taken from a small lake in the Tiger Hills, north of the Avery site, shows that spruce was the dominant species in the locality during late glacial times (Ritchie 1967: 221-24). Stands of white spruce still survive in portions of the Spruce Woods Forest Reserve area about 30 miles north of the Avery site and it is not improbable that relict stands of spruce were found at Rock Lake until comparatively recent times.

Hazelnut and chokecherry seeds were common in the upper few centimeters of forest litter at the site. These probably represented the remains of ripe fruit fallen from the shrubs growing on the site, although Vickers found charred hazelnut and chokecherry seeds deeper in the deposit, some adjacent to the fire hearths (See Chapter III). It seems likely that these represent the remains of hazelnuts and chokecherries gathered by the aboriginal occupants of the site.

CHAPTER XIV

FAUNAL INTERPRETATIONS

The Prehistoric Environment

Since the artifact assemblage suggests an occupational history for the Avery site extending back at least three millenia, the faunal remains probably represent an equally long record if factors of preservation have remained equal. The lack of stratigraphy, however, makes the projection of any time depth into the faunal remains impossible, at least insofar as being able to associate a particular faunal assemblage with any one time period or cultural group.

Although species representing both the forest and grassland communities were present at the Avery site, it cannot be determined whether these communities formerly coexisted in the same region as they do today. Trees and shrubs have probably always existed around Rock Lake, at least during the time span within which we are dealing, since only the most severe conditions would divest the edges of the larger lakes and streams of woodlands. What conditions may have been like on the surrounding plain, however, is impossible to determine without examining data from sources such as the faunal collections from stratified sites, paleobotany, geology, paleoclimatology and

dendrochronology.

Archeological Faunas

At the Lockport, Larter and Cemetery Point sites in southeastern Manitoba, there was an increase in the number of bison bones in the lower levels and a corresponding decrease in the numbers of deer, bear and beaver (MacNeish 1958: 176-77). Since the total number of bones remained fairly constant from level to level an actual increase in the occurrence of woodland animals over grassland species is indicated.

There is no sharp break in the record marking a decrease in the number of grassland species and an increase in woodland species, however, the greatest change occurs during the Anderson phase (500 B.C. to A. D. 500). In the Anderson phase the number of bison bones drop to only 33% of the total bone from 94% of the total bone in the preceding Larter phase. At the same time there is a marked increase in the numbers of fish and mollusks suggesting a less specialized subsistance base. These data may be interpreted as indicating a reduction in the extent of the grasslands about 500 B.C.

A somewhat different situation appears to have existed in southeastern Saskatchewan where the faunal collections indicate a long history of grassland similar to that which exists today. At the Long Creek site (Wettlaufer

and Mayer-Oakes 1960), bison and other grassland species predominated in all nine occupational layers, the earliest dated at 3043 B.C. ± 125.

At the Oxbow Dam site (Nero and McCorquodale 1958), bison bone also predominated in an occupational layer dated at 3142 B.C. ± 210 and 3392 B.C. ± 250. This indicates that a grassland environment existed in south-eastern Saskatchewan about 5000 years ago. Other grassland species identified were the coyote and the kit fox (Vulpes velox).

Farther north, at the Tailrace Bay site near the north end of Lake Winnipeg, evidence for environmental change is also negative. Fifty-nine vertebrate species including 7 fish, 34 birds and 18 mammals, were identified from four partially mixed components representing a time span of about 4500 years. All of the species, with the exception of a few recent, documented additions and extinctions, are present in the area today. Lukens (1967: 320) has thus concluded that "comparison of the Grand Rapids archaeological fauna with the recent terrestrial fauna of the Manitoba north lowlands suggests no major faunal changes and hence, by inference, no major environmental shifts during the period of human occupation."

Paleobotany

Another source of paleoecological data are a series

of pollen diagrams recently collected in the southwestern Manitoba-southeastern Saskatchewan and northwestern Minnesota-northeastern North Dakota areas (Ritchie 1967; Shay 1967).

In the northwestern Minnesota-northeastern North Dakota area oak savanna and prairie dominated between 6000 B.C. and 2000 B.C. followed by a shift to closed deciduous forest about 2000 B.C. (Shay 1967).

In the southwestern Manitoba-southeastern Saskatchewan area data have been taken from eight localities (Ritchie 1967). Combined data from these localities have suggested a vegetation history beginning about 10,500 B.C. dominated by spruce-soapberry and sagebrush each probably occupying different communities. Between 8500 B.C. and 2000 B.C. a shift to treeless grassland is apparent followed by an advance of deciduous (oak-birch-poplar) forest about 1500-2000 B.C.

Geology

Geological data relating to recent deposits seem to originate primarily from archeologically oriented projects. At the Long Creek site (Wettlaufer and Mayer-Oakes 1960), 9 occupational layers were found each separated by a layer of well sorted alluvial deposits, e cept between layers 4 and 5, where a thick layer of poorly sorted sand and gravel occurred. This layer apparently originated from

the valley slopes above the site and was redeposited during a period of increased precipitation. Layer 4 was dated at 293 B.C. ± 110 and Layer 5 at 1413 B.C. ± 115 and 1188 B.C. ± 170 placing the apparent wet period somewhere between 300 B.C. and 1000 - 1500 B.C.

A similar sand unit, Layers 5A to 7, was found at the Mortlach site and is thought to have resulted from the same period of increased precipitation. These alluvial deposits lay immediately above Layer 8, containing Duncan points and dated at 1445 B.C. ± 200 (Wettlaufer 1955: 79).

Paleoclimatology

Bryson and Wendland (1967) have recently correlated data from a variety of sources in an attempt to reconstruct the late glacial climatic patterns for central North America.

Up until about 500 B.C. the climate was drier with milder winters. Beginning about 500 B.C. there was a northeastward displacement of a high-pressure system normally situated over the Great Basin in summer resulting in, among other things, increased precipitation over the mid-west. Since this time, Bryson and Wendland (1967: 292) regard the changes that have taken place as only "small perturbations of the present climatic distribution".

A return to somewhat dryer and warmer conditions began about 350-400 A.D. About A.D. 900 a period of weaker westerlies began, probably resulting in dryer conditions in

the northern mid-west. A return to stronger westerlies about A.D. 1200 pushed arid conditions into the mid-west but by about A.D. 1550 a southerly shift in the circumpolar air masses marked the beginning of a pattern of cooler temperatures and increased precipitation which continued up until the middle of the 19th century.

The above outline correlates generally with Antevs' (1955) classification of the neothermal climatic system into the anathermal, altithermal and medithermal periods. Of particular interest here is the shift from the arid altithermal to the moister conditions of the medithermal about 2000 B.C. Whatever can be said about the applicability of Antevs' classification in the light of recent archaeological data, his suggestion of a shift to greater precipitation at about 2000 B.C. seems to be substantiated.

Dendrochronology

Tree ring studies in North Dakota have provided a detailed record of meteorological conditions during the last 550 years (Will 1946). Periodic precipitation cycles are very much in evidence. Between A.D. 1406 and A.D. 1940 there were 27 dry periods averaging 8.8 years in length and 29 wet periods averaging 8.3 years in length (Will 1946: 20-22). Records of comparable length from South Dakota and Nebraska (Weakly 1943) correlate only in a very general way with the North Dakota data indicating that the smaller

precipitation cycles are not necessarily synchronous for the region. Other than the cyclical nature of the precipitation record there was no evidence for any major climatic changes.

Summary

The evidence summarized above suggests that the climate of southwestern Manitoba during the last 3000 years was probably much like that of today except for a probable period of increased precipitation near the beginning of the period and a concomitant expansion of deciduous forest. If the occupation of the Avery site began about 1500 B.C., as suggested by the presence of Duncan type projectile points, then this may have been during the probable period of increased precipitation. This is not to imply a relationship between the two events, however. Aspen parklands have probably existed in the region for the last 2-3000 years with periodic shifts in the areas occupied by forest and grassland.

Habitat Utilization

Each of the three biotic communities available to the inhabitants of the Avery site--grassland, woodland and water--were exploited. Four species, the bison, pocket gopher, ground squirrel and badger, are representative of the grasslands. Four species, the bear, beaver, bobcat

and deer are natives of the woodlands while the fish and mollusks represent the aquatic communities.

The remaining species found at the Avery site occur in intermediate habitats. The wolf ranged through both the woodlands and grasslands. The chipmunk prefers brush and forest-edge environments and the elk, although primarily a grazing animal, requires woodlands for the shelter of its young. It is not certain whether the snowshoe hare or the jackrabbit is represented; the former requires woods and thickets while the latter lives on the open prairie.

Despite the presence of species representing all of the biotic communities present in the locality, the grassland community was of primary importance because of the bison. In terms of the numbers of individuals represented, bison were far ahead with 77% of all the wild species.

Because of the generally fragmentary nature of the bone sample and the resulting small percentage of identifiable bone material one must be extremely cautious in speculating about the absence of certain species. On the other hand, even in a highly fragmentary sample certain elements such as the teeth and phalanges of larger animals usually survive and are not likely to be missed. Considering that rather fragile bones, such as those of fish, survived at the Avery site the most likely bias stems from the small

size of the sample. Considering all this it is still notable that antelope and moose were not represented. A number of smaller mammals, skunks, racoons, foxes, tree squirrels, porcupines and muskrats, were also absent. Birds, too, were poorly represented considering the large number of species to be found locally.

Diet

Although there were some fifteen species of animals represented at the Avery site not all were equally represented nor can it be assumed that all those present had been eaten by the inhabitants of the site. Bison were clearly the most abundant. Using the estimates given by White (1953: 396-98) for the pounds of usable meat provided by various species of North American animals, it was determined, by multiplying the pounds of meat provided by each of the species represented at the site by the minimum number of individuals of that species represented, that the bison provided 94% of all the usable meat represented by the faunal remains at the site. This figure does not include such bonuses as marrow, bone grease and internal organs which, in the case of an animal the size of a bison, represented a good deal of additional nutrition.

Mention has been made of the extreme fragmentation of the bison bone at the site. This point cannot be over-emphasized for roughly 80% of the bone was smashed into

splinters not more than 5 to 8 cm. in length. Since the bones were pulverized into smaller fragments than would have been necessary, or even practical, if the objective was only to remove the marrow, it seems likely that the rendering of bone grease may have been an important activity at the site. This process, as described by Leechman (1951), involved boiling bone fragments in a vessel of water until the grease collected at the top and could be skimmed off. The grease was either eaten alone or used for cooking or for making pemmican.

Other species represented at the site which were probably utilized for food include the rabbits, beaver, elk, bear and fish. Dogs were also probably eaten; several historic bison hunting tribes did so (Lowie 1963: 39-40). On the other hand, the toad remains were certainly intrusive and the gophers, ground squirrels, chipmunks and rabbits were as likely to have died of natural causes or been killed by dogs as they were to have figured in the occupants' diet. The molluscs too, may have been collected for their shells rather than for food especially if they were not local or are fossil specimens.

Birds were relatively unimportant. This is of interest since several historic tribes in the region are reported to have extensively utilized the native avifauna. Denig (1961: 117) reported that "on the approach of winter immense

numbers of ducks, geese, brants etc., are killed, cleaned and frozen" by the Crees. He added that "in this state they are laid away for winter use."

Fish were, no doubt, a part of the diet. Denig (1961: 117) said that the Crees caught fish throughout the winter "and the supply is inexhaustible." The Plains-Ojibway dried fish and sometimes pounded them into pemmican, bones and all (Howard 1965: 28).

Chokecherry and hazelnut seeds were also found at the site. Some of these were of recent origin, having fallen from shrubs growing on the site, however, others were found deeper in the deposit associated with the fire hearths. Besides the hazelnut and chokecherry, there are presently serviceberries, pin cherries, wild plums, cranberries, raspberries, Indian turnip, rose hips and a variety of other vegetable foods growing in the locality of the site. Most of these foods were gathered in great quantities by the historic tribes of southern Manitoba (Howard 1965: 28-29; Denig 1961: 68) and it is probably safe to assume that the prehistoric peoples did likewise.

To summarize, it seems that although all of the groups who occupied the site depended primarily upon a single grassland species--the bison--they were able to supplement this with smaller game and plant foods, taken from all of the biotic communities in the locality.

Hunting Methods

There were three major methods of hunting bison used by the historic Plains tribes: individual hunting, the pound or jump and the chase. The latter method involved the use of the horse which was unknown to most, if not all, of the people who lived at Rock Lake. Individual hunting involved several different techniques and was engaged in more or less continuously by individuals or small groups of hunters. The pound or jump was the most important hunting method in late prehistoric times. Some tribes continued to take bison in this manner long after they acquired the horse, some well past the middle of the 19th century (Ewers 1949; Kehoe 1967: 75-76).

Considering the amount of bison bone present, not only at the Avery site, but throughout the locality, and the favorable topography, it seems plausible that pounds, such as those used in the region in historic times by the Assiniboine, Cree and Plains-Ojibwa (Denig 1930: 533; Mandelbaum 1940: 189-91; Howard 1965: 22-24) were in operation in prehistoric times at Rock Lake. No actual kill sites have been identified in the locality, however.

One can only speculate as to how the smaller game may have been taken. A variety of methods were probably used including deadfalls and snares. MacNeish (1958: 129) suggests that unilaterally barbed bone points similar to those found at the Avery site (Page 152) were used to

harpoon fish. Nets may have been used judging from the presence of a possible net-impressed potsherd (Page 141). The abundance of projectile points indicates that the primary weapons were the bow and arrow, or, in earlier times, the atlatl.

Season of Occupation

Nomadic bands making their seasonal rounds no doubt visited the Rock Lake locality during all seasons of the year, although the near absence of foetal and calf bones of bison may indicate that the occupation of the Avery site took place largely in the late fall or early winter.

The black bear semi-hibernates and may not have been available in the dead of winter. Ground squirrels and chipmunks also hibernate, however, all of the other species represented at the Avery site, except possibly some of the birds, would have been available the year around.

Butchering Techniques

Two factors complicate attempts to understand the butchering techniques used at the Avery site; first, the artifact assemblage indicates that more than one cultural group occupied the site during different periods of time so that a variety of butchering techniques may be represented, and second, the utilization of the bison was so thorough that only the carpals, tarsals and phalanges

consistently escaped being pulverized. Another factor might have been varying distances of the kill sites from the camp; some bison may have been killed nearly on the site while other kills may have been made some distance away. This would have affected the choice of elements to be transported back to camp.

Skulls and Mandibles. The presence of horn core fragments and upper cheek teeth, most of which were complete, and some with fragments of the maxilla still attached to the roots, indicates that the skulls must have been brought into camp. Although the horns could have been struck from the skull it would have been impossible to remove the premolars and molars from the maxilla of a skull still clothed in flesh without breaking the teeth. Other than the horn cores and teeth the largest fragment of skull found was a section of maxilla containing the second and third molars. This indicates that the skulls must have been completely utilized. The brains would have been removed to use as food or as an agent in tanning hides. The nasal cartilage was often eaten as a delicacy (Kehoe 1967: 69). From there the skull must have been stripped of the remaining flesh and pulverized into fragments which may then have been boiled in the preparation of bone grease (Leechman 1951: 335-36). Even the horn cores appear to have been smashed and the marrow gouged from their interiors.

The mandibles were similarly pulverized although occasionally condyles and symphyses were recognizable. Again, the teeth were typically unbroken. Since the lower cheek teeth were more abundant than the upper cheek teeth (59.2% of the total) it is possible that the mandibles were, on a few occasions, brought into camp without the skulls.

Vertebrae. Bison vertebrae were extremely rare in the bone sample; only five cervical and four caudal vertebrae were recognized whereas several hundred vertebral elements would have had to be present in order to agree with the total number of limb bones represented. It is by no means certain that vertebrae were simply absent, however, for a number of vertebral fragments were found, particularly epiphyses of the centrum, which could not be positively identified, but which, judging from their size may have been from bison.

Rib fragments were abundant and most were probably from bison. Only a few of these included the articulating ends. Pelvic fragments, however, were absent.

It seems probable that the rib cage was removed from the carcass by breaking the ribs just below the articulating ends and brought into camp as a unit. The skull may have been severed by chopping through the cervical vertebrae immediately in front of the rib cage. The vertebral column

with the articulating ends of the ribs still attached and the pelvic girdle would then have been left at the scene of the kill. This would account for the apparent absence of post-cervical vertebrae and pelvic elements and the presence of rib fragments in the bone debris. The few articulating ends of ribs, if they are in fact bison, would indicate that either the rib cage was occasionally separated from the spinal column by breaking through the zygopophyses of the vertebrae or that sections of the vertebral column were, in some instances, brought to camp. The very few caudal vertebrae indicate that the tail was only rarely brought to camp.

Limbs. Considering the number of limb elements present; carpals, tarsals, phalanges, articulating ends and splintered shafts of longbones, both the hind and front legs must have been severed from the trunk and brought into camp complete.

The forlimb was probably severed from the trunk by chopping through the humerus-scapula joint. This may account for the absence of proximal humeri. Two distal scapula fragments were present which suggests that the forlimb may have sometimes been removed by breaking the scapula above its articulating end, however, fragments of the spines of a few scapula were present which, if they were bison, would mean that at least a few complete scapulas were brought into camp.

The hind leg was probably severed from the trunk either by cutting through the neck of the femur or by chopping through the shaft of the ilium and separating the right and left halves of the pelvis and the symphysis although the complete absence of pelvic fragments and a single proximal femur lend little support to either hypothesis.

The longbones of both the hind and forelimbs were smashed into fragments. Apparently even the articulating ends were often pulverized since the most abundant forelimb articulation represents only 34.6% of the number of limbs represented by the carpals and the most abundant hindlimb articulation is only 37.5% of the limbs represented by the tarsals.

The carpals and tarsals were almost always complete and their numbers frequently near the minimum number of individuals. The carpals and tarsals must have been separated from the limb and discarded as a unit probably by chopping through the distal end of the radius and tibia and through the proximal ends of the metapodials.

The phalanges also consistently escaped destruction. Apparently the feet were separated from the limbs and discarded as a unit by breaking the metapodials either at or just above the distal articulation. Only about one distal metapodial survived for every two feet that were

represented in the sample. This is of interest because if the least useful portion of the limb was to be discarded the entire lower limb below the carpus or tarsus would have been discarded as a unit. As it were, however, even the thick metapodials were utilized indicating maximum utilization of the bison.

Also notable is that, while the numbers of 1st and 2nd phalanges were very close, there were only about two-thirds as many 3rd phalanges (65%). Wood (1962a: 202) explains a similar situation at the Paul Brave, Huff and Demery sites in the Middle Missouri region by stating that the 3rd phalanges were not preserved in the soil. This could not have been the case at the Avery site, however, since the 3rd phalanges which did survive were as well preserved as the rest of the bone sample. Reeves (1966a: 48) suggests that the absence of terminal phalanges in Layer 4 of the Kenney site may be due to their being used in the manufacture of glue.

What appear to be tooth marks are present on a few of the phalanges indicating that they may have provided sinewy morsels for the dogs.

Comparisons

The above interpretations differ in several respects from the observations on butchering techniques reported from sites in the Middle Missouri region (White 1953, 1954;

Wood 1962a). At the Middle Missouri sites the lower limbs were usually severed below the tarsals and carpals and left at the scene of the kill and, except at Rock Village, scapula were brought into camp to be made into hoes. In general, the bone was much less comminuted than at the Avery site. The longbones were smashed for the removal of marrow but the other elements were largely complete.

At the Boarding School site (Kehoe 1967), a bison kill rather than a campsite, the elements represented were those left at the scene of the kill rather than those brought into camp. In the First Bone Layer at the Boarding School site, vertebrae were the most abundant elements. Nearly half of the occiputs, horn cores and scapulas were also present. Also, unlike the Avery site, the lower hind limbs were often removed below the tibia and left at the scene of the kill. In the lower bone levels all elements were fairly equally represented indicating that the kill was processed at the site.

At the Keaster site (Davis and Stallcop 1965) there was a fairly uniform distribution of skeletal elements indicating that the camp was located near enough to the scene of the kill so that it was not necessary to transport the limbs and rib cage to the camp. Meat was evidently plentiful enough so that it was not necessary to utilize every scrap of meat and bone. This resulted in a number of

complete bones and articulations being left at the site.

The only distinctive observation on the butchering techniques at the Keaster site was the recovery, in Level IV, of an articulated tarsus. The tarsus was severed by chopping through the distal tibia and the proximal metatarsal.

In Layer 8 of the Kenney site (Reeves 1966a) in southwestern Alberta, vertebrae, scapula, pelvic fragments and ribs with the articulating ends still attached were recovered indicating that the kill must have taken place relatively close to the camp (Reeves 1966a: 49). In Layers 4 and 6, however, lighter butchering was practiced; vertebrae, cranial fragments and the articulating ends of ribs were absent. Also the bison were more intensively used in Layers 4 and 6 as evidenced by the more highly fragmented condition of the bone. Also the number of front quarters were less than those of hind quarters.

Butchering practices at the Long Creek site seem to have most closely paralleled those at the Avery site. Maximum utilization of the bison was indicated. According to McCorquodale (1960: 92) "the carpals, tarsals and phalanges were the only elements that escaped at least partial destruction". It was inferred from the presence of teeth and petrosals that the skulls and mandibles were brought into camp, although "The largest fragment of skull

found was . . . a battered portion of a maxilla containing three teeth" (McCorquodale 1960: 92).

Vertebrae were scarce in all layers and were completely absent in Layers 3, 4 and 6 (the Pelican Lake, Besant and late Oxbow components). The rib cage was evidently separated from the vertebral column and brought to camp as a unit, the limbs were broughtto the camp complete and there the carpus, tarsus and feet were separated and discarded as articulated units. The longbones were then broken into fragments for the removal of marrow and the rendering of bone grease.

CHAPTER XV

THE CULTURE SEQUENCE

The problems of sorting out the traits of the various archeological phases represented in the mixed components of the Avery site are largely insurmountable, however, it is possible to tentatively reconstruct a culture sequence on the basis of diagnostic artifacts identified in sequences on the northwestern Plains and in southeastern Manitoba.

One of the most important and abundant tools made by the specialized bison hunting groups on the plains was the projectile point. It has proven to be, as Mulloy (1958: 143) pointed out, "the most stylized and the most numerous artifact as well as that which demonstrated the greatest change through time." Projectile points were well represented at the Avery site and because they represent a longer record than do the ceramics, and because they are more accurately dated elsewhere they are considered the most diagnostic artifacts. Pottery, another sensitive indicator of culture change, was also well represented, but was present for less than half the inferred occupational history of the site.

The following sequence is based upon the diagnostic

artifacts--projectile points and pottery--and is constructed by reference to sequences for these artifacts established at other sites in the region. As will be implied, the sequence is probably valid for all of southwestern Manitoba. The names of the phases are largely those in current use, although not necessarily in print.

The McKean-Duncan-Hanna Phase

The earliest projectile points represented at the Avery site are the Duncan and Hanna types. Duncan points, comparable in size and form to the Avery site specimens (Plate 3 a-b) occurred at the Mortlach site in Saskatchewan in a Layer dated at 1445 B.C. ± 200 (Wettlaufer 1955: 58). A Hanna point, identical in size, form and material to one of the points from the Avery site (Plate 3 c) occurred in Layer 5 of the Long Creek site dated at 1413 B.C. ± 115 and 1188 B.C. ± 170 (Wettlaufer and Mayer-Oakes 1960: 109). On the basis of the similarities between these points I would estimate the Duncan-Hanna occupation of the Avery site to have occurred about 1000-1500 B.C.

Duncan and Hanna points, along with McKean lanceolate points, are usually considered manifestations of a single complex. Mulloy (1954: 444) would regard all three as varieties of a single type. Wheeler (1954: 9), while regarding the points as discrete types points out that they are obviously closely related, since they occur in association

at a number of sites, and that a McKean-Duncan-Hanna developmental sequence is suggested since while McKean and Duncan points have been found together at a number of sites, Hanna points have not been found with McKean points where Duncan points were lacking.

McKean lanceolate points were found at the Lake Shore site, about 150 meters south of the Avery site on the first terrace (Vickers 1949a: 2-4) and four McKean points were found in Levels 5 and 6 of the United Church site on the second terrace, about one-fourth mile west of the Avery site (MacNeish and Capes 1958: 120). If the McKean lanceolate point is the earliest in the McKean-Duncan-Hanna series it would seem that the earliest occupations at Rock Lake were on the first and second terrace levels and that the occupation of the Avery site, on the third terrace level, began somewhat later.

Other tools associated with the Duncan-Hanna component at the Avery site may include oval bifaces (Plate 12 a-c), lamellar end scrapers (Plate 9 i-l), retouched flakes (Plate 10 a-h) and rough choppers (Plate 14d). Artifacts resembling these were found in Layer 5 at the Long Creek site (Wettlaufer and Mayer-Oakes 1960: Plate 14) and in Layer 8 at the Mortlach site (Wettlaufer 1955: Plates 13-14). Pottery has never been found in components of this phase.

The contention that all of the groups occupying the

Avery site depended primarily on the bison is supported by the dominance of bison in the Hanna component of the Long Creek site (McCorquodale 1960: 88-89) where over 90% of the faunal remains were bison. Other species represented included the dog, rabbit and pocket gopher. Other fauna relating to the McKean-Duncan-Hanna phase include the United Church site where bison again predominated along with small amounts of beaver, canid, deer and fish bone (MacNeish and Capes 1958: 147) and Pictograph Cave I where 65% of the bone material was bison and the remainder consisted of deer, elk, antelope and a variety of smaller mammals (Olson 1958: 225). A series of sites in the Powder River basin of Wyoming and Montana indicate that communal bison kills were operated during this period (Bentzen 1962, 1963; Frison 1968).

The campsites of this phase are small and were evidently briefly occupied by small groups. At Rock Lake there seems to have been a preference for sites nearer to the present lake shore during this phase. Both the small, temporary camps and the inferred bison-hunting subsistence pattern would suggest the presence of small, nomadic bands.

The Pelican Lake Phase

The fourteen Pelican Lake points found at the Avery site belong to a type having a wide distribution on the northern Plains and adjacent regions. Dates for components

containing Pelican Lake points range from 680 B.C. ± 100 at Signal Butte II (Olson and Broecker 1961: 170) to A.D. 342 ± 165 at Wedding of the Waters Cave, Wyoming (Frison 1962). The Pelican Lake component at the Long Creek site was dated at 293 B.C. ± 100. At the Mortlach site a Pelican Lake component occurred between layers dated at 445 B.C. ± 290 and 1445 B.C. ± 200. A date of A.D. 0 ± 250 was determined for a probably late Pelican Lake component at the Keaster site (Davis and Stallcop 1965: 16). Larter tanged points found at the Larter site on the Red River north of Winnipeg appear to be a closely related variety but are wider and thicker than the Pelican Lake points found to the west (MacNeish 1958: 100-101). MacNeish assigns these to the Larter phase estimated to date from 500 to 1500 B.C. I would estimate the Pelican Lake occupation of the Avery site at between 500 B.C. and the time of Christ.

Other artifacts possibly associated with the Pelican Lake points at the Avery site include lamellar and prismatic end scrapers (Plate 9 e-l), ovate bifaces (Plate 11 e-j) and retouched lamellar and prismatic flakes (Plate 10 a-h). These artifacts appeared in Pelican Lake components at the Long Creek site (Wettlaufer and Mayer-Oakes 1960: 44-47), Pictograph Cave II (Mulloy 1958: 47-51) and Spring Creek and Wedding of the Waters Caves (Frison 1962, 1965). The

use of the atlatl is also known from Spring Creek and Wedding of the Waters Caves. Pottery has not been found associated with Pelican Lake materials.

It seems likely that the Pelican Lake phase was an indigenous development, at least in some parts of the Plains, growing out of the preceding McKean-Duncan-Hanna phase. Hanna points exhibit incipient corner notches and barbed shoulders which may have given rise to the distinctively barbed and corner notched Pelican Lake points.

Faunal assemblages from Pelican Lake components point to a specialized big game hunting economy centering on the bison. This is particularly true in the northern components such as Layer 4 of the Long Creek site where all of the faunal remains, except for a few canids and a duck, consist of bison bones (McCorquodale 1960: 88-89). Bison kill sites such as the Old Woman's Buffalo Jump (Forbis 1962), the Head-Smashed-In Buffalo Kill (Reeves 1966b: 6), the Keaster site (Davis and Stallcop 1965) and the Carter Ferry Buffalo Kill (Shumate 1967) show that the Pelican Lake people had mastered the techniques of taking bison in pounds and jumps.

Pelican Lake phase campsites are not extensive, suggesting temporary occupation by fairly small groups. An economy oriented toward bison hunting suggests the presence of nomadic bands which probably coalesced into larger groups for seasonal bison hunts.

Exposure of the dead and secondary burial may be indicated at the Bracken Cairn in southwestern Saskatchewan where the remains of three individuals were found associated with artifacts including a Pelican Lake projectile point, ovate bifaces and prismatic end scrapers (King 1961).

The Besant Phase

The Besant points from the Avery site are comparable to points from a number of components on the northwestern Plains which date from A.D. 310 ± 60 (Forbis 1962: 109) to A.D. 460 ± 60 (Brian Reeves, personal communication 1967). A Besant occupation at about A.D. 300 to A.D. 500 is suggested for the Avery site.

The source of the Besant phase has not been established. An indigenous development out of the preceding Pelican Lake phase has been suggested (Davis and Stallcop 1965: 17), however, recent investigators are looking to the Middle Missouri and the northern Boreal Forest (Reeves 1966b; Husted and Mallory 1967: 229).

Associated items of technology at the Avery site probably include oval and ovate bifaces (Plate 11 e-j, Plate 12 a-c), lamellar and plano-convex end scrapers (Plate 9 a-d, i-l), triangular, unnotched points (Plate 7) and retouched blade-like flakes (Plate 10 a-h). These elements were present at the Kenney site (Reeves 1966a) and in lesser frequencies at the Long Creek and Mortlach

components (Wettlaufer and Mayer-Oakes 1960: 40-43; Wettlaufer 1955: 39-50).

Of particular interest at the Kenney site was the presence of an "attenuated, prepared core technology" utilizing "prepared lamellar or rectangular flakes" retouched on one or more edges (Reeves 1966a: 174-75). This is sufficiently similar to the incipient blade-like flake industry represented at the Avery site, and correspondingly distinct from anything known from other archeological units in the region, to enable a fairly confident association of this industry with the Besant points at the Avery site and with the Besant phase generally. The decided preference for "Knife River Flint" both in the blade-like flake industry and in the manufacture of Besant points tends to confirm this association.

There are two groups of pottery at the Avery site having sufficient antiquity to be possibly associated with Besant material: Laurel ware and Avery Corded ware. Although the general similarity of some of the Laurel tradition lithic materials (MacNeish 1958; Wright 1967) to those of the Besant phase is puzzling the present evidence favors an Avery Corded-Besant association. Kehoe (1964) described 17 coarse, grit tempered and cord-impressed sherds with straight, plain rims from a Besant component at the Walter Felt site in Saskatchewan which appear identical to

Avery Corded ware. Kehoe's (1964: 52) suggestion that this pottery resembles sherds from the Keith Focus in Nebraska also corresponds with my association of Avery Corded ware with the Plains Woodland manifestations of the central Plains. Another apparent association of Besant points and Avery Corded ware occurred at site 32MZ2 near Williston, North Dakota where Besant points and lamellar end scrapers made of "Knife River Flint" occurred in a bone layer with Avery Corded pottery (Wood 1956). Finally, points which appear identical to Besant were found at site Vy-1 in central Nebraska associated with vertically and diagonally corded conoidal vessels bearing a close resemblance to Avery Corded ware (Hill and Kivett 1940: Plates 5-10).

These associations suggest not only that Avery Corded ware may be associated with Besant points but that the Besant phase may be derived from Woodland tradition cultures to the southeast. The apparent scarcity of Besant pottery on the northwestern Plains may be the result of a population gradually giving up pottery making as they moved farther out onto the Plains. Such a development appears to have taken place among the historic tribes of the region (Ewers 1945) and may have occurred in prehistoric times as well.

Economically the Besant people were bison hunters. At the Kenney and Long Creek sites (Reeves 1966a: 39-41;

McCorquodale 1960: 88-89) bison predominated and were supplemented only by small amounts of deer, antelope and rodents. Dogs are represented at the Kenney site. Several bison kill sites such as the Old Woman's Buffalo Jump (Forbis 1962), the Wahkpa Chu'gn site (Davis and Stallcop 1966) and the Mulbach site (Gruhn 1965) indicate that the taking of bison in pounds and jumps was commonplace.

In southwestern Manitoba, Besant sites such as the Kreiger, Lukiew-Sutton, Calf Mountain and Richards Kill sites (Vickers 1945, 1948b, c; Hlady 1967) are abundant and relatively rich in cultural remains. The increase in the number of Besant points over Pelican Lake points at the Avery site seem to be representative of conditions elsewhere on the northern Plains. Whether this indicates an increase in population or simply that more recent sites are more easily found is not known. Nevertheless, Besant phase campsites appear to represent fairly lengthy or repeated occupations by moderately large groups. Nomadic bands were probably the rule as far as social organization was concerned with seasonal multi-band groupings for communal bison hunts.

Site 32-BA-1, a mound group in eastern North Dakota dated at A.D. 90 ± 150 (Trautman 1963: 73) contained points which appear to be Besant (Hewes 1949: Fig. 82 b-e) in association with secondary burials in log covered chambers.

This may indicate a mound building tradition in the early Besant phase. The Tufton Burial in northeastern Montana suggests that the dead may have been exposed and secondarily buried under small rock cairns in that area (Joyes n. d.).

The Avonlea Phase

The Avonlea phase is represented at the Avery site by the presence of the small, delicate Avonlea projectile points. Although originally defined as a horizon marker for the northwestern Plains (Kehoe and McCorquodale 1961), recent radiocarbon dates indicate a longer life span for this type than originally suspected. Dates from the Avonlea component at the Gull Lake Bison Drive range from A.D. 210 ± 60 to A.D. 730 ± 80 (Kehoe 1966: 829-30). This would indicate that the Avonlea phase was actually, in part, contemporaneous with the Besant phase rather than being a strictly later development.

The origins of the Avonlea phase remain enigmatic since the projectile points appear to be a more radical departure from antecedent forms than any of the Middle and Late Period point types on the northwestern Plains. This problem has spawned no little speculation. Kehoe (1966: 839), for example, has suggested Athabascan migrants as the carriers of Avonlea culture and Husted and Mallory (1967: 228) look to the Middle Missouri region for possible

prototypes.

Of nearly thirty reported Avonlea sites, only two, Layer 6 of the Garratt site (Watson 1966) and Layer 2 of the Long Creek site (Wettlaufer and Mayer-Oakes 1960: 37-41) are single component occupations. Since even Layer 2 of the Long Creek site is believed to contain some intrusive material and there is no detailed report available on the Garratt site there is little that can be said about the Avonlea tool assemblage. The biface types reported from the Timber Ridge site in northern Montana (Davis 1966: 103) resemble the crescendic, lanceolate and rectangular forms from the Avery site (Plate 11 a-d), Plate 12 d-i).

While the Avonlea phase has been reported as lacking ceramics (Kehoe 1966: 840), pottery is present at the Avonlea components of the Long Creek and Garratt sites. There is some uncertainty, however, as to what type of pottery is associated with the Avonlea points. There is no published description of the Garratt site ceramics although the sherds I have seen from the site were grey, fabric impressed specimens, evidently from a conoidal vessel. Some of the sherds in Layer 2 of the Long Creek site were certainly intrusive, however, both fabric impressed and cord-wrapped paddle impressed sherds were well represented along with a scattering of plain, dentate, cord-wrapped stick, check stamped and "scored" (stamped?) sherds. Kehoe

and McCorquodale (1961: 186-87) report a vessel of Truman Plain Rim ware in a field near the Avonlea type site but discount a strong likelihood of association.

These incomplete and partially conflicting data create serious problems for suggesting an Avonlea-pottery association at the Avery site. All of the fabric impressed ware at the site is considered to be much too late for a possible Avonlea association. Laurel ware seems an unlikely candidate since there is nothing remotely similar to Avonlea points in other Laurel components. Avery Corded ware is a possibility, however, Avery Corded ware occurred at the United Church site as did a few Besant points but Avonlea points were not present. Truman Plain Rim remains a possible association although there were no points resembling Avonlea at the Truman Mound site.

The dependence of the Avonlea people on the bison is demonstrated by the faunal remains in Layer 2 of the Long Creek site (McCorquodale 1960: 88-89) and especially by the large number of bison kill sites containing Avonlea points (Kehoe and McCorquodale 1961; Davis 1966). The majority of these sites are pounds but a few are reported to be true jumps where the bison were deiven over cliffs (Davis 1966: 103-105). Davis (1966: 113) mentions that there is some evidence associating stone drive lanes with Avonlea bison kills.

Avonlea campsites indicate fairly small, temporary camps occupied by nomadic bands. The extensive use of bison kills suggests seasonal multi-band groupings.

The Manitoba Phase

The Manitoba phase is comparatively well known, thanks to the work of MacNeish (1954, 1958) in southeastern Manitoba and at the Stott Mound and Village. The Manitoba phase can be recognized at the Avery site by the small amount of Blackduck pottery rather than by a diagnostic projectile point type. The small amount of Blackduck pottery at the Avery site does not argue for a long or intensive occupation of the site by Manitoba phase people, in fact, some Blackduck pottery has been reported from components of the Selkirk phase (MacNeish 1958: 140). This may, since Selkirk phase material is well represented at the Avery site, account for most, if not all, of the Blackduck pottery at the Avery site. On the other hand, Manitoba phase occupation of southwestern Manitoba is well established, such as at the Stott Mound and Village (MacNeish 1958), the United Church site (MacNeish and Capes 1958) and the Calf Mountain site (Chris Vickers, personal communication, 1967).

Wilford (1945) and Vickers (1948d) were the first to propose that the Manitoba phase represented the cultural remains of the prehistoric Assiniboine. MacNeish (1954: 49-51) later supported this conclusion. Evans (1961a, b)

has challenged this association and argues that the Manitoba phase may be attributed to the Cree.

MacNeish (1958: 55) estimated that the Manitoba phase appeared about A.D. 1000, however, a date of A.D. 798 ± 120 for the earliest Blackduck pottery layer at the Scott site in Minnesota (Cooper and Johnson 1964: 478) suggests that a beginning date for the phase could be about 200 years earlier.

The tool inventory for the Manitoba phase is well known (MacNeish 1958) and a number of artifact associations can be suggested with confidence. Late Side-notched points are known from Manitoba phase components, as well as Plains Triangular points (Plates 7-8), lamellar and plano-convex end scrapers (Plate 9 a-d, i-l), grooved mauls (Plate 15) and tubular pipes (Plate 18 a).

Bone tools from Manitoba phase sites include split bone awls (Plate 26 a-b), end scraper handles (Plate 27 a-c), spatulas (Plate 26 g-i), longbone fleshing tools (Plate 29), beaver tooth gouges (Plate 28 j) and barbed bone points (Plate 28 a-d).

Pottery includes all types of Blackduck ware (Plate 23 a-c) as well as a few surviving types of Laurel ware (Plate 20). Interestingly, several Mandan-like sherds have been found in Manitoba phase sites (MacNeish 1954: 36, 1958: 171), including the Avery site, which may indicate

trade with the Middle Missouri tribes. This is even more likely if the Manitoba phase can be assigned to the Assiniboine since they are known to have traded regularly with the Mandan at a fairly early date. La Verendrye, for example, found the Assiniboines planning a trading expedition to the Mandan villages in the summer of 1737 and the following year actually accompanied them (Burpee 1927: 253-54).

Manitoba phase sites in southeastern Manitoba reveal an unspecialized subsistence pattern with an extensive utilization of mollusks, deer and fish. In southwestern Manitoba, however, both the Avery site and the Stott Mound and Village (MacNeish 1954) point to a shift toward a specialized bison hunting economy.

Manitoba phase campsites in southwestern Manitoba are quite small. Both the limited size of the campsites and the nomadic bison hunting subsistence pattern suggest that the primary social unit was probably the nomadic band.

Mound building activity can definitely be associated with the Manitoba phase including secondary burials with grave goods (MacNeish 1954, 1958: 49-50).

The Selkirk Phase

Selkirk phase occupation at the Avery site is indicated by the large number of Winnipeg Fabric Impressed potsherds.

This ware is representative of the latest components in southeastern Manitoba, estimated by MacNeish (1958: 55) have a time span of from A.D. 1350 to A.D. 1750. If this is an accurate estimate it is likely that the Selkirk occupation of the Avery site took place in the earlier part of this interval judging from the absence of trade goods at the site.

MacNeish (1958: 67) believes the Selkirk phase to be a manifestation of the prehistoric and early historic Cree and Wright has reportedly collected data from the Boreal forest region confirming this association (Mayer-Oakes 1967: 355). Although Selkirk phase materials are well represented in southeastern and northern Manitoba (MacNeish 1958: 67) they seem to be rare in southwestern Manitoba. Fabric impressed pottery has not been reported from other sites on the grasslands (Vickers 1949a, 1948a, b, c; MacNeish 1954) except the United Church site, also at Rock Lake (MacNeish and Capes 1958: 144). This may indicate that the Rock Lake locality served as an outlying hunting camp for peoples living primarily to the north and east or a favorite campsite of the westernmost vangard of Cree beginning to adapt to a prairie bison hunting way of life.

Non-ceramic items of technology associated with the Selkirk phase are very much like those of the Manitoba phase: Late Side-notched and Plains Triangular projectile

points, plano-convex end scrapers, pebble hammerstones, grooved mauls and a variety of bone tools. The ceramics consist of several types of fabric impressed ware, including the Alexander Fabric Impressed type found at the Avery site.

Selkirk phase sites in southeastern Manitoba contained large numbers of deer, fish and shellfish but few bison. At the Avery site, however, the situation appears to be reversed with a primary dependance on the bison.

Selkirk components in southeastern Manitoba are somewhat more extensive than those of preceding groups (MacNeish 1958). Selkirk pottery was also the most abundant ware at the Avery site. This may indicate that larger groups of people were involved or that the same sites were occupied for long periods of time. Nomadic bands were probably present and may have been enlarged for seasonal bison hunts on the grasslands.

Figure 11 summarizes the major cultural units of southwestern Manitoba during the last 3-4000 years and the major sites at which these units are represented.

FIGURE 11

SUGGESTED CULTURE SEQUENCE FOR SOUTHWESTERN MANITOBA

Date	Phase	Component
1800		
1600	Selkirk	United Church Avery
1400		
1200		
1000	Manitoba	Avery Stott
800		
600	Avonlea	Avery
400	Besant	Kreiger Calf Mt.
AD200		Richards Kill
0	Pelican Lake	Avery
500BC		
1000	Hanna Duncan McKean	Avery Lake Shore United Church
1500		
2000		
2500		
3000		
3500		
4000		

CHAPTER XVI

SUMMARY AND CONCLUSION

The Avery site is located on a wooded terrace above Rock Lake in the aspen parkland of southwestern Manitoba. Artifacts found at the site indicate that the location has been used for a campsite for some 3-4000 years. The debris left by the various groups who occupied the site was not separated stratigraphically, however, so that it was necessary to construct a cultural sequence by comparing the materials to that from sites at other localities. Using this method, a tentative local sequence has been suggested (Fig. 11).

The evidence presently available suggests that throughout the occupational history of the Avery site the climate has been much like that of the present with minor fluctuations in temperature and rainfall.

It would appear, judging from the archaeological record, that the economics, technology and probably social organization of the various groups occupying southwestern Manitoba have remained relatively stable for long periods of time. Tradition, in the sense of "temporal continuity represented by persistent configurations" (Willey and

Phillips 1958: 37), would seem to be a key concept here.

One of the most persistent traditions in the sequence is bison hunting. Evidence from the Avery site as well as the nearby United Church site (MacNeish and Capes 1958: 147) indicate that although the environment provided woodland and aquatic species, which were occasionally taken, the people living in the locality during the last 3-4000 years depended primarily upon the bison.

Another activity represented throughout the sequence is a chipped stone industry in which large number of projectile points, scraping and cutting tools were manufactured. During one or more phases, probably the Besant, a more advanced blade industry was present. Projectile point styles changed gradually occasionally interrupted by the introduction of new cultural traits or populations into the area.

The preferred lithic material was brown chalcedony ("Knife River Flint"). Although the source of "Knife River Flint" is unknown it was especially preferred by the earlier cultural units at the site, the Duncan-Hanna, Pelican Lake and Besant. Later groups depended more heavily upon a variety of local materials.

It is probably safe to assume that the nomadic band was the primary social unit among bison hunting groups in prehistoric times. Judging from ethnographic as well as archaeological data one may speculate that a constellation

of other traits, such as portable dwellings made of skins, certain techniques of butchering and food preparation, shamanism and exposure of the dead may also have great antiquity on the Plains.

Nomadic bison hunting, probably with most of the traits listed above, is a very ancient tradition on the Plains, with roots in the Paleo-Indian stage. This tradition apparently persisted in the Rock Lake locality, and on the northern Plains generally, from Paleo-Indian times until the 19th century A.D. Whether this tradition was, at any time, interrupted by climatic or other factors is not certain.

The strength and persistence of the nomadic bison hunting tradition has often been underestimated, largely because of its stability and lack of spectacular developments. As a result Walter Prescott Webb's (1931: 507) admonition that "the West cannot be understood as a mere extension of things Eastern" has often gone unheeded. Too often archaeologists have attempted to place the cultures of the Plains into the historical-developmental stages of the East although archaeologists actually working on the Plains, particularly the northwestern Plains, will have no part of such a classification. While it is true that certain traits may have entered the Plains from the East it does not follow that culture stages or traditions can

be defined by the presence of a few such traits.

If a greater number of culture traits diffused to the Plains rather than from them it was probably because the Plains were attractive economically. There is historic as well as prehistoric evidence of several cultural units entering the Plains from elsewhere.

In terms of cultural geography, southwestern Manitoba appears to have been most closely related to the northwestern Plains. Prior to about A.D. 900-1000, when the Manitoba phase appeared, the archaeological units of southwestern Manitoba clearly relate to the west, however, after that date there is an increase in influences from southeastern Manitoba and surrounding area. It would seem that southern Manitoba represents a transition area with nomadic bison hunting in the southwest and a more generalized "woodland" subsistence pattern in the southeast.

A detailed classification of the prehistoric cultures of the northern Plains, including southwestern Manitoba, has hardly begun. It is certain that the archaeology of the region promises to become a good deal more complex in the future. A simple chronological evolution from one phase to another, with each unit being homogeneous over a wide geographical area, is rapidly becoming untenable. On the other hand, some surprising relationships over broad areas are becoming apparent. Many of the phases discussed

in this thesis are widespread enough in space and time to be considered traditions in themselves. Future archaeological work in the region will, no doubt, see these units divided into a number of areal phases each showing small but significant differences in response to ecological or cultural factors.

APPENDICES

APPENDIX A

LITHIC ARTIFACTS FROM THE AVERY SITE*

Function Class	Type	No.
Projectile Points:	Duncan	5
	Hanna	3
	Pelican Lake	14
	Besant	28
	Avonlea	39
	Plains Triangular	40
	Late Side-Notched	43
	Misc. Forms	10
	Point Fragments	30
	Total	212
Scrapers:	Plano-Convex End Scrapers	36
	Prismatic End Scrapers	34
	Lamellar End Scrapers	34
	Split Pebble End Scrapers	3
	End Scraper Fragments	5
	Side Scrapers	133
	Large Scraping Tools	8
	Total	253

*Includes the artifacts collected by Vickers as well as those excavated during 1966.

APPENDIX A--Continued

Function Class	Type	No.
Drills:	Drills	5
	Total	5
Heavy Stone Tools:	Pebble Hammerstones	14
	Grooved Mauls	7
	Choppers	3
	Anvil	1
	Grinding Stones	4
	Pestle	1
	Steatite Tube	1
	Irregular Percussion Tool	1
	Total	32
Bifaces:	Crescent Shaped	7
	Ovate	14
	Oval	3
	Lanceolate	3
	Rectangular	3
	Misc. Forms	29
	Total	55
Misc. Artifacts	Pipe Fragment	1
	Large Point or Biface	1
	Total	2

APPENDIX A--Continued

Function Class	Type	No.
Unworked Stone	Shale Disks	35
	Fire Broken Rocks	31
	Unworked Flakes	761
	Cores	12
	Water Worn Pebbles	10
	Mematite Lumps	12
	Mica	4
	Total	865

APPENDIX B

AVERY SITE CERAMICS*

	Ware or Group	No.
Rim Sherds:	Laurel	58
	Avery Corded	31
	Truman Plain Rim	16
	Blackduck	14
	Winnipeg Fabric Impressed	60
	Aberrant Sherds	57
	Miscellaneous	33
	Total	269
Body Sherds:	Plain	901
	Cord-Wrapped Paddle	711
	Linear Stamped	571
	Fabric Impressed	582
	Simple Stamped	184
	Cord-Wrapped Stick	17
	Dentate Stamped	15
	Punctate	16
	Incised	02
	Miscellaneous	400
	Total	3399

*Includes the artifacts collected by Vickers as well as those excavated during 1966.

APPENDIX C

WORKED BONE FROM THE AVERY SITE*

Function Class	No.
Awls	5
Flakers	2
Spatulas	6
End Scraper Handles	4
Fleshing Tools	2
Knives	5
Barbed Points	4
Cut Metapodials	6
Beamers	1
Beaver Tooth Gouge	1
Cut Antler	1
Total	37

*Includes the artifacts collected by Vickers as well as those excavated during 1966.

APPENDIX D

FREQUENCY DISTRIBUTION OF BISON REMAINS*

	Mature			Immature		
Element	L.	R.	Axial	L.	R.	Axial
Horn Core			21			
Mandible		6				
U. Cheek Teeth			26			49
L. Cheek Teeth			59			50
Incisors			23			22
Vertebrae,						
Axis			3			
Cervical			2			
Caudal			2			2
Scapula	1	1				
Humerus, Dist.	4	1				
Radius, Prox.	4	4			1	
Dist.		2		1		
Ulna, Prox.	1	1				
Dist.		1		1		
Carpals,						
Radial	15	12				

*Includes the bones collected by Vickers as well as those excavated during 1966.

APPENDIX D--Continued

	Mature			Immature		
Element	L.	R.	Axial	L.	R.	Axial
Carpals,						
Intermediate	12	13			1	
Ulnar	3	4				
2nd-3rd	18	7		1		
4th	12	12				
Accessory		12				
Metacarpal, Prox.	6	6	4			
Dist.			6	1		6
5th Metacarpal		6				
Femur, Prox.		1				
Dist.	1					
Patella		5				
Tibia, Dist.	3	3				
Tarsals,						
Tibial	5	5				
Fibular	2	3				1
C-4th	8	6				
2nd-3rd	11	5				
Metarsal, Prox.		1	1			
Dist.		2				3

APPENDIX D--Continued

Element	Mature L.	Mature R.	Mature Axial	Immature L.	Immature R.	Immature Axial
Phalanges, 1st			57			13
2nd			70			6
3rd			46			2
Sesamoids, Prox.			53			
Dist.			35			
Lateral Malleolus			21			
Total	812 Bison Bones					

APPENDIX E

FREQUENCY DISTRIBUTION OF NON-BISON REMAINS*

	Mature			Immature		
Element	L.	R.	Axial	L.	R.	Axial
Dog:						
Maxilla	3	3	4			
Mandible	8	9				
Premolars, Upper			10			
Lower			14			
Molars, Upper			11			
Lower			9			
Canines			29			
Incisors			9			
Vertebrae,						
Cervical			1			
Thoracic			2			
Lumbar			3			
Caudal			10			
Humerus	1					
Radius		1				
Carpal, Ulnar		2				

*Includes the bones collected by Vickers as well as those excavated furing 1966.

APPENDIX E --Continued

Element	Mature L.	Mature R.	Mature Axial	Immature L.	Immature R.	Immature Axial
Metapodial, Prox.			24			1
Dist.			4			
Rib			8			
Femur, Prox.		1				
Tibia, Dist.	3					
Fibular		1				
Tarsal, Tibial	2					
Tarsal, 4th	2					
Phalanges			45			
Wolf:						
Maxilla	1	1				
Premolars			4			
Molars			3			
Canine			1			
Incisor			1			
Radius, Prox.	1					
Rabbit:						
Mandible	2					
Humerus, Dist.	3					
Tibia	3					

APPENDIX E--Continued

Element	Mature			Immature		
	L.	R.	Axial	L.	R.	Axial
Beaver:						
Molars			6			
Incisor			1			
Elk:						
Antler tines			2			
Metatarsus	1					
Black Bear						
Maxilla	1	1				
Molars	2	2				
Canine		1				
Pocket Gopher:						
Mandible	2					
Femur	2					
Chipmunk						
Humerus		1				
Inominate		1				
Bobcat:						
Humerus, Dist.	1					

APPENDIX E--Continued

Element	Mature L.	Mature R.	Mature Axial	Immature L.	Immature R.	Immature Axial
Badger:						
Mandible	1					
Human:						
Mandible			1			
Ground Squirrel:						
Mandible		1				
Bird:						
Ulna	1	1				
Metatarsus	1					
Femur	1					
Tibia		1				
Northern Pike						
Mandible	1					
Pre-Operculum	1					
Basi-Occipital			1			
Vertebrae			103			
White Sucker:						
Vertebrae			2			

APPENDIX E--Continued

Element	Mature			Immature		
	L.	R.	Axial	L.	R.	Axial
Toad:						
Vertebrae			6			
Urostyle			1			
Scapula	2					
Suprascapula		1				
Humerus	2	2		1		
Radio-Ulna	1	1				
Tibio-Fibular	2	1				
Pelvis			1			
Tarsus			2			
Metacarpals & Phalanges			8			

LITERATURE CITED

ANTEVS, ERNST

1955 Geological Climate Dating in the West. American Antiquity, Vol. 20, No. 4, pp. 317-335. Salt Lake City.

ARTHUR, GEORGE W.

1966 An Archaeological Survey of the Upper Yellowstone River Drainage, Montana. Agricultural Economics Research Report No. 26, Montana Agricultural Experiment Station. Bozeman.

BAKER, FRANK C.

1928 The Fresh Water Mollusca of Wisconsin. Wisconsin Geological and Natural History Survey, Bulletin No. 70, Part II. Madison.

BENTZEN, RAYMOND

1962 The Powers-Yonkee Bison Trap. Plains Anthropologist, Vol. 7, No. 16, pp. 113-118. Lincoln.

1963 The Bentzen-Little Bald Mountain Site. Plains Anthropologist, Vol. 8, No. 19, pp. 41-51. Lincoln.

BIRD, RALPH D.

1930 Biotic Communities of the Aspen Parkland of Central Canada. Ecology, Vol. 11, pp. 356-442. Brooklyn.

1961 Ecology of the Aspen Parkland of Western Canada. Research Branch, Canada Department of Agriculture, Ottawa.

BLISS, WESLEY L.

1950 Birdshead Cave, a Stratified Site in Wind River Basin, Wyoming. American Antiquity Vol. 15, No. 3, pp. 187-196. Salt Lake City.

BRYSON, REID A. AND
WAYNE M. WENDLAND
1967 Tentative Climatic Patterns for Some Late Glacial and Post-Glacial Episodes in Central North America. In Life, Land and Water, edited by William J. Mayer-Oakes, pp. 271-298. University of Manitoba Press, Winnipeg.

BURPEE, LAWRENCE J.
(Editor)
1927 Journals and Letters of Pierre Gaultier de Varennes de La Verendrye. Publications of The Champlain Society, Toronto.

CAPES, KATHERINE H.
1963 The W. B. Nickerson Survey and Excavations, 1912-15, of the Southern Manitoba Mounds Region. National Museum of Canada, Anthropology Papers, No. 4. Ottawa.

COOPER, LELAND R. AND
ELDON JOHNSON
1964 Sandy Lake Ware and Its Distribution. American Antiquity, Vol. 29, No. 4, pp. 474-479. Salt Lake City.

CORNWALL, IAN W.
1956 Bones For the Archaeologist. Phoenix House, London.

COUES, ELLIOT
(Editor)
1897 New Light on the Early History of the Greator Northwest. The Manuscript Journals of Alexander Henry and David Thomson, 1799-1814. 3 Vols. New York.

CRABTREE, DON E. AND
ROBERT BUTLER
1964 Notes on Experiments in Flint Knapping 1: Heat Treatment of Silica Minerals. Tebiwa, Vol. 10, No. 1, pp. 8-24. Pocatello.

CRANE, H. R. AND
JAMES B. GRIFFIN
1958 University of Michigan Radiocarbon Dates III. Science, Vol. 128, No. 3332. Lancaster.

CRANE, H. R. AND
JAMES B. GRIFFIN
1961 University of Michigan Radiocarbon Dates. Radiocarbon, Vol. 3, pp. 119-120. New Haven.

CVANCARA, ALAN M.
1967 Mussels of the Red River Valley In North Dakota and Minnesota and Their Use in Deciphering Drainage History. In Life, Land & Water, edited by William J. Mayer-Oakes, pp. 187-196. University of Manitoba Press, Winnipeg.

DAVIS, LESLIE B.
1966 Avonlea Point Occurrence in Northern Montana and Canada. Plains Anthropologist, Vol. 11, No. 32, pp. 100-116. Lincoln.

DAVIS, LESLIE B. AND
EMMETT STALLCOP
1965 The Keaster Site (24PH401), A Stratified Bison Kill Occupation in the Missouri Breaks Area of North-Central Montana. Montana Archaeological Society, Memoir No. 2.

1966 The Wahkpa Chu'gn Site: (24HL101), Late Hunters In the Milk River Valley, Montana. Montana State University Anthropology Paper No. 1. Bozeman.

DENIG, EDWIN THOMSON
1930 Indian Tribes of the Upper Missouri. Edited by J. N. B. Hewitt. Bureau of American Ethnology, Forty-Sixth Annual Report (1928-1929). Washington.

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

ELLIS, J. H. AND
W. H. SHAFER
1943 Reconnaissance Soil Survey of South-Central Manitoba. Soils Report No. 4, Manitoba Department of Agriculture. Winnipeg.

EVANS, EDWARD G.

1961a A Reappraisal of the Blackduck Focus or Headwaters Lakes Aspect. MS., Master's Thesis, University of Minnesota, Minneapolis.

1961b Prehistoric Blackduck-Historic Assiniboine: A Reassessment. Plains Anthropologist, Vol. 6, No. 14, pp. 271-275. Lincoln.

1961c Ceramic Analysis of the Blackduck Ware and Its General Cultural Relationships. Proceedings, The Minnesota Academy of Science, Vol. 29, Minneapolis.

EWERS, JOHN C.

1945 The Case For Blackfoot Pottery. American Anthropologist, Vol. 47, pp. 289-299. Washington.

1949 The Last Bison Drives of the Blackfoot Indians. Journal of the Washington Academy of Sciences, Vol. 39, No. 11. Washington.

FORBIS, RICHARD G.

1960 Some Late Sites in the Oldman River Region, Alberta. National Museum of Canada, Bulletin 162. Ottawa.

1962 The Old Woman's Buffalo Jump, Alberta. National Museum of Canada, Bulletin 180, Contributions to Anthropology 1960, Part I. Ottawa.

FRISON, GEORGE C.

1962 Wedding of the Waters Cave, 48HO301, A Stratified Site in the Big Horn Basin of Northern Wyoming. Plains Anthropologist, Vol. 7, No. 18, pp. 246-265. Lincoln.

1965 Spring Creek Cave, Wyoming. American Antiquity, Vol. 31, No. 1, pp. 81-94. Salt Lake City.

1968 Site 48SH312: An Early Middle Period Bison Kill in the Powder River Basin of Wyoming. Plains Anthropologist, Vol. 13, No. 39, pp. 31-39. Lincoln.

GRIFFIN, JAMES B.
1965 Prehistoric Pottery From Southeastern Alberta. In An Introduction to the Archaeology of Alberta, Canada by H. M. Wormington and Richard G. Forbis. Proceedings No. 11, Denver Museum of Natural History. Denver.

GRUHN, RUTH
1965 Summary of Field Work at the Muhlbach Site, Near Stettler, Alberta. Archaeological Society of Alberta Newsletter, No. 6, pp. 2-5. Edmonton.

HALSTEAD, E. C.
1959 Ground-Water Resources of the Brandon Map-Area, Manitoba. Geological Survey of Canada, Memoir 300. Ottawa.

HENRY, ALEXANDER
1901 Travels and Adventures in Canada and the Indian Territories Between the Years 1760 and 1776. George N. Morang and Company. Toronto.

HEWES, GORDON W.
1949 Burial Mounds In The Baldhill Area, North Dakota. American Antiquity, Vol. 14, No. 4, pp. 322-328. Menasha.

HILL, A. T. AND MARVIN KIVETT
1940 Woodland-Like Manifestations In Nebraska. Nebraska History, Vol. 21, No. 3, pp. 147-243. Lincoln.

HLADY, WALTER M.
1965 A Manitoba Source of Knife River Flint. Manitoba Archaeological Newsletter. Vol. IV, No. 2, pp. 3-7. Winnipeg.

1967 A Besant Phase Kill Site in Southwestern Manitoba. Manitoba Archaeological Newsletter, Vol. IV, No. 2, pp. 3-9. Winnipeg.

HOWARD, JAMES H.
1965 The Plains-Ojibway or Bungi. South Dakota Museum Anthropological Papers No. 1. Vermillion.

HURT, WESLEY R. JR.
1960 A New Radiocarbon Date from South Dakota. Museum News, Vol. 21, Nos. 11 & 12, p. 1. Vermillion.

HUSTED, WILFRED M. AND OSCAR L. MALLORY
1967 The Fremont Culture: Its Derivation and Ultimate Fate. Plains Anthropologist, Vol. 12, No. 36, pp. 222-232. Lincoln.

JOYES, DENNIS C.
n.d. The Tufton Burial. MS. Copy in Author's Library.

KEHOE, THOMAS F.
1964 Middle Woodland Pottery from Saskatchewan. Plains Anthropologist, Vol. 9, No. 23, pp. 51-53. Lincoln.

1966 The Small Side-Notched Point System of the Northern Plains. American Antiquity, Vol. 32, No. 2, pp. 827-841. Salt Lake City.

1967 The Boarding School Bison Drive Site. Plains Anthropologist, Vol. 12, No. 35, pp. 1-165. Lincoln.

KEHOE, THOMAS F. AND BRUCE A. McCORQUODALE
1961 The Avonlea Point: Horizon Marker for the Northwestern Plains. Plains Anthropologist, Vol. 9, No. 23, pp. 51-53. Lincoln.

KENDREW, W. G. AND B. W. CURRIE
1955 The Climate of Central Canada. Department of Transport, Ottawa.

KENYON, WALTER
1961 The Swan Lake Site. Royal Ontario Museum Art and Archaeology Division, Occasional Paper No. 3. Toronto.

KING, D. R.
1961 The Bracken Cairn. The Blue Jay, Vol. XIX, No. 1, pp. 45-53. Regina.

KIVETT, MARVIN F.
1952 Woodland Sites in Nebraska. Nebraska State Historical Society, Publications in Anthropology, No. 1. Lincoln.

1953 The Woodruff Ossuary, A Prehistoric Burial Site in Phillips County, Kansas. Bureau of American Ethnology, Bulletin 154. Washington.

LAWRENCE, BARBARA
1951 Post-Cranial Skeletal Characteristics of Deer, Pronghorn and Sheep-Goat with Notes on Bos and Bison. Report No. 4 of the Awatovi Expedition. Papers of the Peabody Museum, Harvard University, Vol. XXXV, No. 3, pp. 1-43. Cambridge.

LEECHMAN, DOUGLAS
1951 Bone Grease. American Antiquity. Vol. 16, No. 4, pp. 355-356. Salt Lake City.

LEHMER, DONALD J.
1954 Archaeological Investigations in the Oahe Dam Area, South Dakota, 1950-51. Bureau of American Ethnology, Bulletin 158. Washington.

1966 The Fire Heart Creek Site. Smithsonian Institute, River Basin Surveys, Publications in Salvage Archaeology No. 1. Lincoln.

LISTER, ROBERT F.
1951 Excavations at Hells Midden, Dinosaur National Monument. University of Colorado Studies, Series in Anthropology, No. 3.

LOWIE, ROBERT H.
1963 Indians of the Plains. The Natural History Press, New York.

LUKENS, PAUL W. JR.
1967 The Tailrace Bay Site Fauna. In Life, Land and Water edited by William J. Mayer-Oakes, pp. 313-321. University of Manitoba Press, Winnipeg.

MacNEISH, RICHARD S.
1954 The Stott Mound and Village, Near Brandon, Manitoba. Annual Report of the National Museum of Canada, 1952-1953, Bulletin 132, pp. 20-65. Ottawa.

MacNEISH, RICHARD S.
1958 An Introduction to the Archaeology of Southeastern Manitoba. National Museum of Canada, Bulletin 157. Ottawa.

MacNEISH, RICHARD S. AND KATHERINE H. CAPES
1958 The United Church Site Near Rock Lake, Manitoba. Anthropologica, No. 6, pp. 119-165. Ottawa.

MANDELBAUM, DAVID G.
1940 The Plains Cree. American Museum of Natural History Anthropological Papers, Vol. 37, Part 2, pp. 154-316. New York.

MAYER-OAKES, WILLIAM J.
1967 Prehistoric Human Population History of the Glacial Lake Agassiz Region. In Life, Land and Water edited by William J. Mayer-Oakes, pp. 339-378. University of Manitoba Press, Winnipeg.

M cCORQUODALE,BRUCE A.
1960 Vertebrate Faunal Remains. In The Long Creek Site by Boyd Wettlaufer and William J. Mayer-Oakes, pp. 86-96. Department of Natural Resources Anthropology Series No. 2. Regina.

MULLOY, WILLIAM
1943 A Prehistoric Campsite Near Red Lodge, Montana. American Antiquity, Vol. 9, No. 2,

1954 The McKean Site in Northeastern Wyoming. Southwestern Journal of Anthropology, Vol. 10, No. 4, pp. 432-460. Albuquerque.

1958 A Preliminary Historical Outline for the Northwestern Plains. University of Wyoming Publications, Vol. 22, Nos. 1 & 2. Laramie.

MULLOY, WILLIAM AND OSCAR LEWIS
1943 Some Early Types of Points from the Lower Yellowstone Country. American Antiquity. Vol. 8, No. 3, pp. 298-299. Menasha.

NERO, ROBERT W. AND
BRUCE A. McCORQUODALE
1958 Report of an Excavation at the Oxbow Dam Site. The Blue Jay, Vol. 16, No. 2, pp. 82-90. Regina.

NEUMAN, ROBERT W.
1960 The Truman Mound Site, Big Bend Reservoir Area, South Dakota. American Antiquity, Vol. 26, No. 1, pp. 78-92. Salt Lake City.

1967 Radiocarbon-Dated Archaeological Remains on the Northern and Central Great Plains. American Antiquity, Vol. 32, No. 4, pp. 471-486. Salt Lake City.

OLSON, EDWIN A. AND
W. S. BROECKER
1959 Lamont Natural Radiocarbon Measurements V. American Journal of Science, Radiocarbon Supplement, Vol. 1, pp. 1-28. New Haven.

1961 Lamont Natural Radiocarbon Measurements VII. Radiocarbon, Vol. 3, pp. 141-175. New Haven.

OLSON, EVERETT C.
1958 Report on the Fauna of Pictograph Cave. In a Preliminary Historical Outline For The Northwestern Plains by William Mulloy, pp. 224-232. University of Wyoming Publications, Vol. 22, No. 1. Laramie.

OLSEN, STANLEY J.
1960 Post-Cranial Skeletal Characters of Bison and Bos. Papers of the Peabody Museum of Archaeology and Ethnology, Harvard University, Vol. XXXV, No. 4. Cambridge.

1964 Mammal Remains from Archaeological Sites, Part I, Southeastern and Southwestern United States. Papers of the Peabody Museum of Archaeology and Ethnology, Harvard University, Vol. LVI, No. 1. Cambridge.

REEVES, BRIAN O. K.
1966a The Kenney Site: A Stratified Campsite in Southwestern Alberta. MS. Master's Thesis, University of Calgary, Calgary.

REEVES, BRIAN O. K.
1966b The Besant Phase in Space, Time and Culture. MS., Department of Archaeology, University of Calgary, Calgary.

RITCHIE, JAMES C.
1967 Holocene Vegetation of the Northwestern Precincts of the Glacial Lake Agassiz Basin. In Life, Land and Water edited by William J. Mayer-Oakes, pp. 217-229. University of Manitoba Press, Winnipeg.

ROUSE, IRVING
1960 The Classification of Artifacts in Archaeology. American Antiquity, Vol. 25, No. 3, pp. 313-323. Salt Lake City.

SETON, ERNEST T.
1909 Life Histories of Northern Animals. 2 Vols. Charles Scribner's Sons, New York.

SHAY, CREIGHTON T.
1967 Vegetation History of the Southern Lake Agassiz Basin During the Past 12,000 Years. In Life, Land and Water, edited by William J. Mayer-Oakes, pp. 231-252. University of Manitoba Press, Winnipeg.

SHUMATE, MAYNARD
1950 The Archaeology of the Vicinity of Great Falls, Montana. Montana State University, Anthropology and Sociology Papers No. 2. Missoula.

1967 The Carter Ferry Buffalo Kill. Archaeology In Montana, Vol. 8, No. 8, pp. 1-10.

SISSON, SEPTIMUS AND JAMES D. GROSSMAN
1953 The Anatomy of the Domestic Animals. W. B. Saunders Co. London.

SKINNER, MORRIS F. AND OVE C. KAISEN
1947 The Fossil Bison of Alaska and Preliminary Revision of the Genus. Bulletin of the American Museum of Natural History, Vol. 89, pp. 123-256. New York.

SOWLS, LYLE K.
1948 The Franklin Ground Squirrel. Citellus franklini (Savine), and Its Relationship to Nesting Ducks. Journal of Mammalogy, Vol. 29, pp. 113-137. Baltimore.

STEINBRING, JACK
1966 The Manufacture and Use of Bone Defleshing Tools. American Antiquity, Vol. 31, No. 4, pp. 575-581. Salt Lake City.

STOLTMAN, JAMES B.
1962 A Proposed Method For Systematizing the Modal Analysis of Pottery and Its Application to the Laurel Focus. MS., Master's Thesis, University of Minnesota. Minneapolis.

TAMPLIN, MORGAN J.
1966 The Glacial Lake Agassiz Survey, 1966: A Preliminary Report. MS., Laboratory of Anthropology, University of Manitoba, Winnipeg.

TRAUTMAN, MILTON A.
1963 Isotopes Inc. Radiocarbon Measurements III. Radiocarbon, Vol. 5, pp. 62-79. New Haven.

VICKERS, CHRIS
1945 Archaeology of the Rock and Pelican Lake Area of South-Central Manitoba. American Antiquity, Vol. 11, No. 2, pp. 88-94. Menasha.

1946a Archaeology of the Rock and Pelican Lake Area of Southern Manitoba. Papers Read Before the Historical and Scientific Society of Manitoba, Season 1944-45, pp. 14-24. Winnipeg

1946b Archaeological Field Work--Great Plains. American Antiquity, Vol. 12, No. 1. Menasha.

1948a Archaeological Report 1947. Projects of the Historical and Scientific Society of Manitoba. Winnipeg.

1948b Archaeological Report 1946. Projects of the Historical and Scientific Society of Manitoba. Winnipeg.

VICKERS, CHRIS
1948c Archaeological Report 1945. Projects of the Historical and Scientific Society of Manitoba. Winnipeg.

1948d The Historical Approach and the Headwaters Lakes Aspect. Plains Archaeological Conference Newsletter, Vol. 1, No. 3. Lincoln.

1949a Archaeological Report 1948. Projects of the Historical and Scientific Society of Manitoba. Winnipeg.

1949b Manitoba Pottery Types. Proceedings of the Fifth Plains Conference for Archaeology, p. 85. University of Nebraska, Laboratory of Anthropology, Notebook No. 1. Lincoln.

WATSON, GILBERT
1966 Research Reports, 1966. Saskatchewan Archaeology Newsletter, No. 15, p. 3. Regina.

WEAKLY, WARD F.
1943 Tree-Rings and Archaeology in the Central Plains. MS., Master's Thesis, University of Nebraska, Lincoln.

WEBB, WALTER PRESCOTT
1931 The Great Plains. Grosset and Dunlap, New York.

WEDEL, WALDO
1961 Prehistoric Man on the Great Plains. University of Oklahoma Press, Norman.

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

WETTLAUFER, BOYD AND
WILLIAM J. MAYER-OAKES
1960 The Long Creek Site. Anthropological Series No. 2, Department of Natural Resources. Regina.

WHEELER, RICHARD P.
1954 Two New Projectile Points Types: Duncan and Hanna Points. The Plains Anthropologist, No. 2, pp. 7-14. Lincoln.

1956 "Quill Flatteners" or Pottery Modeling Tools. Plains Anthropologist, No. 6, pp. 17-20. Lincoln.

WHITE, THEODORE E.
1953 Observations on the Butchering Techniques of Some Aboriginal Peoples, No. 2. American Antiquity, Vol. 19, No. 2, pp. 160-164. Salt Lake City.

1954 Observations of the Butchering Techniques of Some Aboriginal Peoples, Nos. 3, 4, 5 and 6. American Antiquity, Vol. 19, No. 3, pp. 254-264. Salt Lake City.

WILFORD, LLOYD A.
1945 The Prehistoric Indians of Minnesota; The Headwaters Lakes Aspect. Minnesota History, Vol. 26, No. 4, pp. 312-329. St. Paul.

WILL, GEORGE F.
1946 Tree Ring Studies in North Dakota. Bulletin 338, Agricultural Experiment Station, North Dakota Agricultural College. Fargo.

WILLEY, GORDON R. AND PHILLIP PHILLIPS
1958 Method and Theory in American Archaeology. University of Chicago Press, Chicago.

WOOD, W. RAYMOND
1956 A Woodland Site Near Williston, North Dakota. Plains Anthropologist, No. 6, pp. 21-24. Lincoln.

1962a Notes on the Bison Bone From the Paul Brave, Huff, and Demery Sites (Oahe Reservoir). Plains Anthropologist, Vol. 7, No. 17, pp. 201-204. Lincoln.

1962b Cord-Roughened Pottery In North Central North America. Plains Anthropologist, Vol. 7, No. 18, pp. 232-236. Lincoln.

WOOD, W. RAYMOND AND
ALAN R. WOOLWORTH
1964 The Demery Site (39C01) Oahe Reservoir Area, South Dakota. Bureau of American Ethnology Bulletin 189, River Basin Surveys Papers No. 34. Washington.

WRIGHT, JAMES V.
1963 An Archaeological Survey Along the North Shore of Lake Superior. Anthropology Papers No. 3, National Museum of Canada. Ottawa.

1967 The Laurel Tradition and the Middle Woodland Period. Bulletin 217, National Museum of Canada. Ottawa.

PLATES

Plate 1

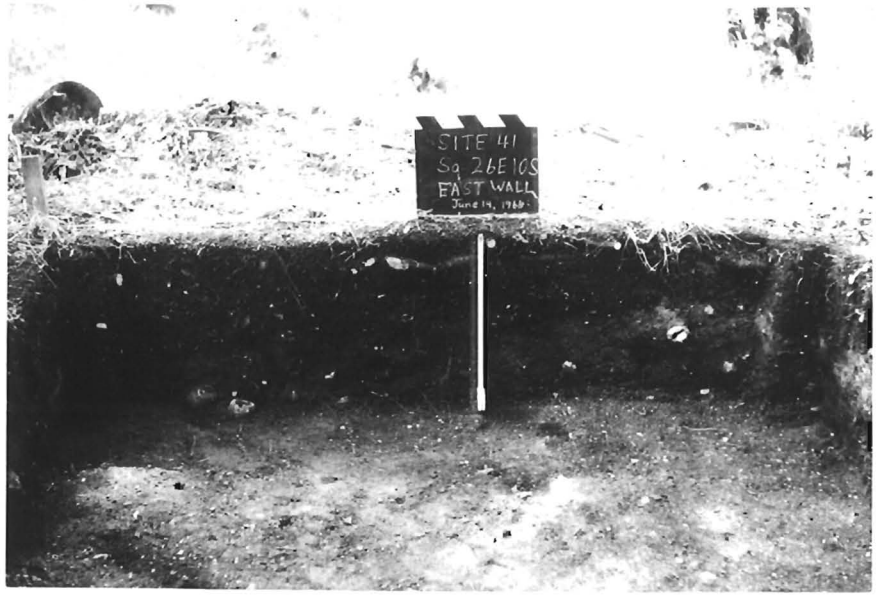
The Avery Site

a. The Site Before Excavation

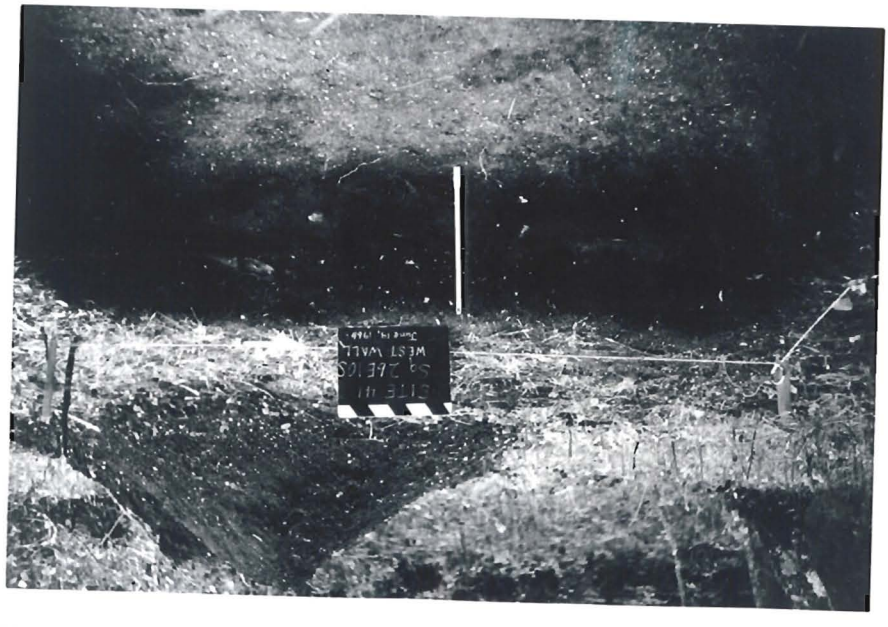
b. The Site During Excavation

a

b


SITE 41
Sq 26E10S
EAST WALL
June 14, 1968

a


SITE 41
Sq 26E10S
WEST WALL
June 14, 1968

b

Plate 2

EXCAVATION UNIT PROFILES

a. Unit 26E10S, East Wall

b. Unit 26E10S, West Wall

Plate 3

Projectile Points

a, b. Duncan Points

c, d. Hanna Points

e, f. Form 1 Points

g, h. Form 2 Points

i. Form 3 Point

j. Form 4 Point

k. Form 5 Point

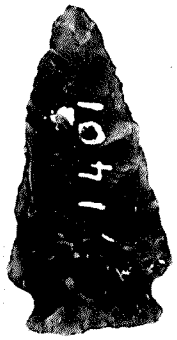
l. Form 6 Point

a

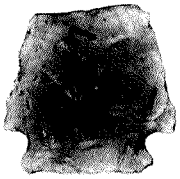
b

c

d



e



f

g

h

i

j

k

l

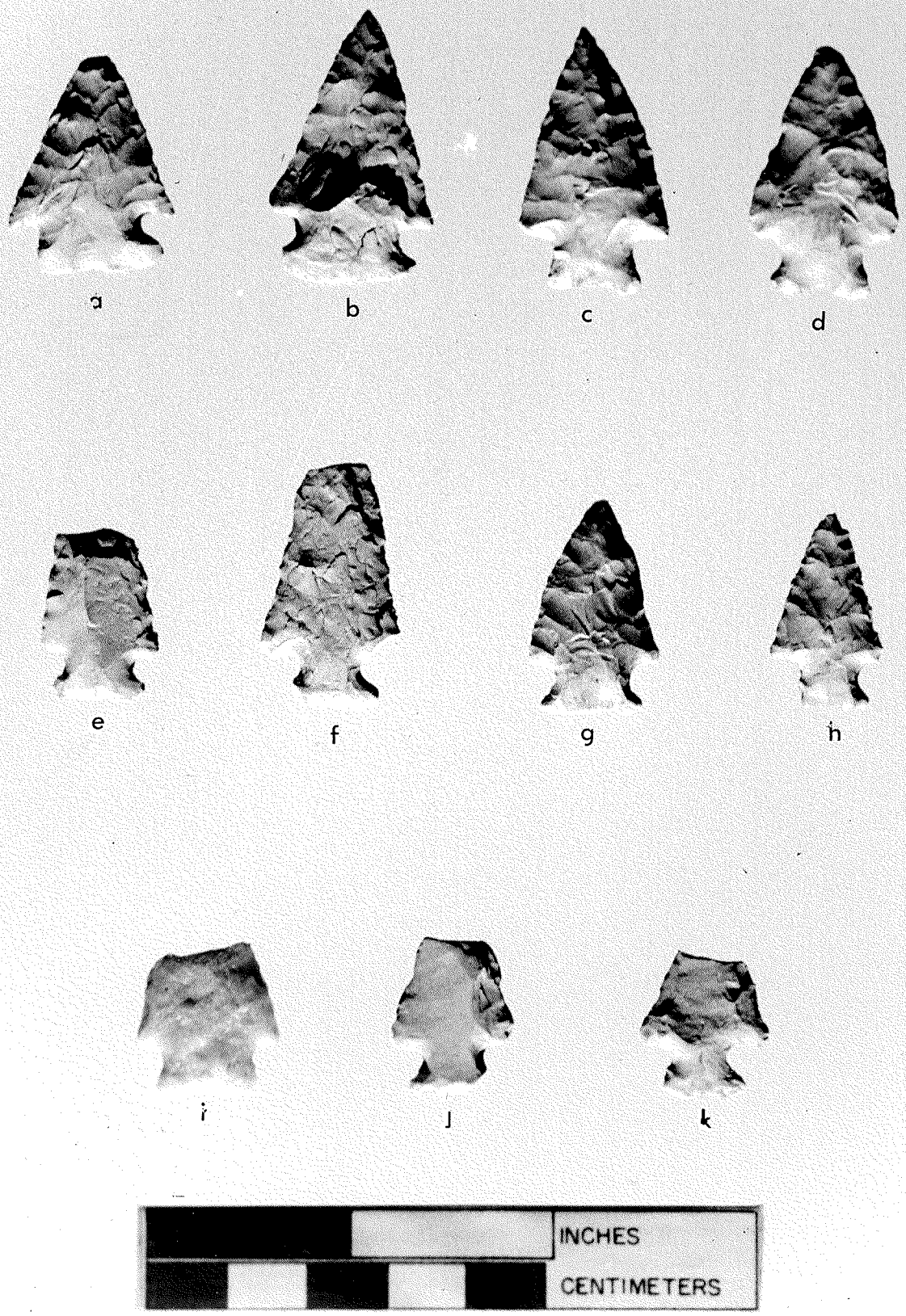

a
b
c
d
e
f
g
h
i
j
k
INCHES
CENTIMETERS

Plate 4

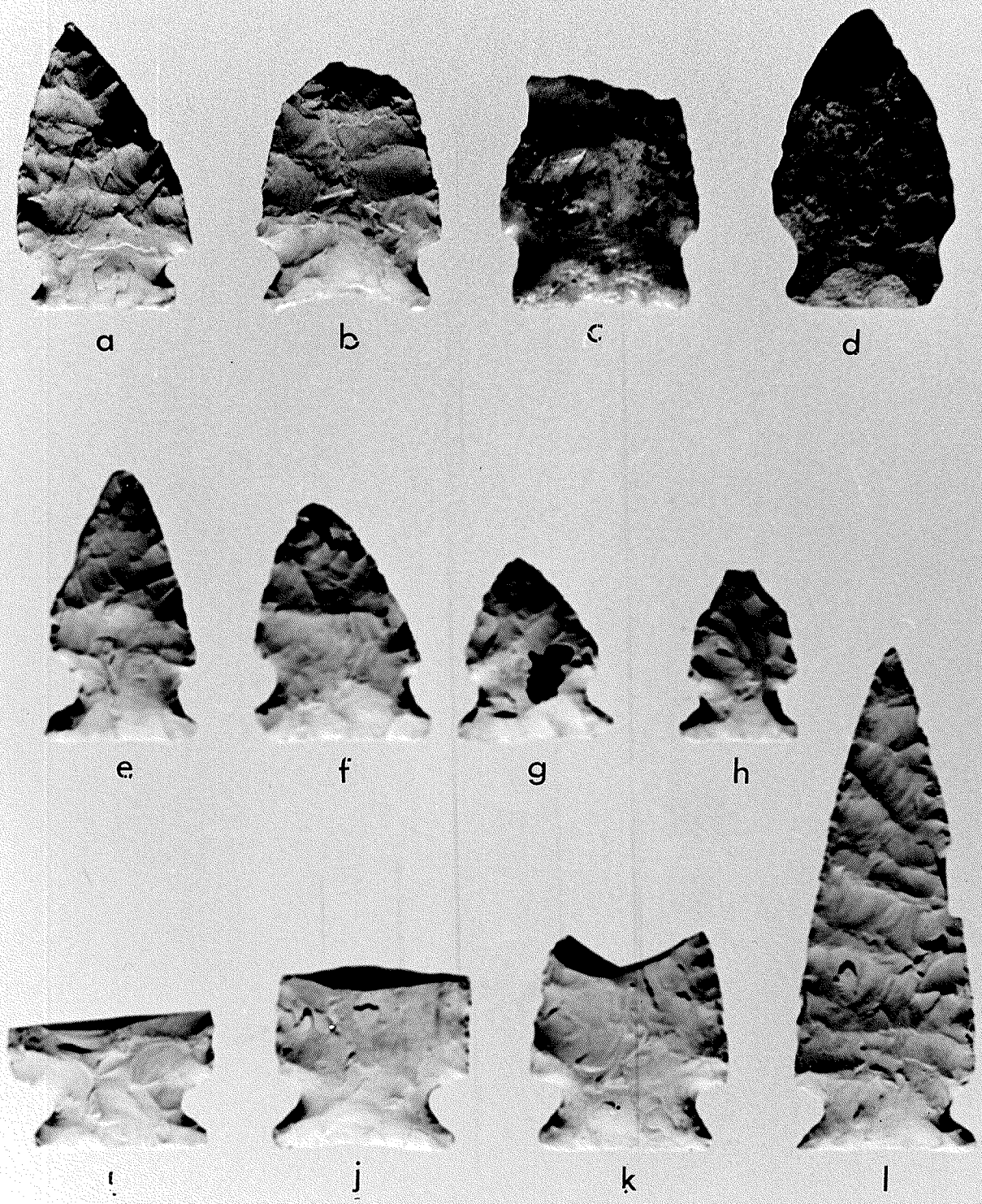
Pelican Lake Points

a-k. Pelican Lake Points

Plate 5

Besant Points

a-1. Besant Points


a
b
c
d
e
f
g
h
i
j
k
l

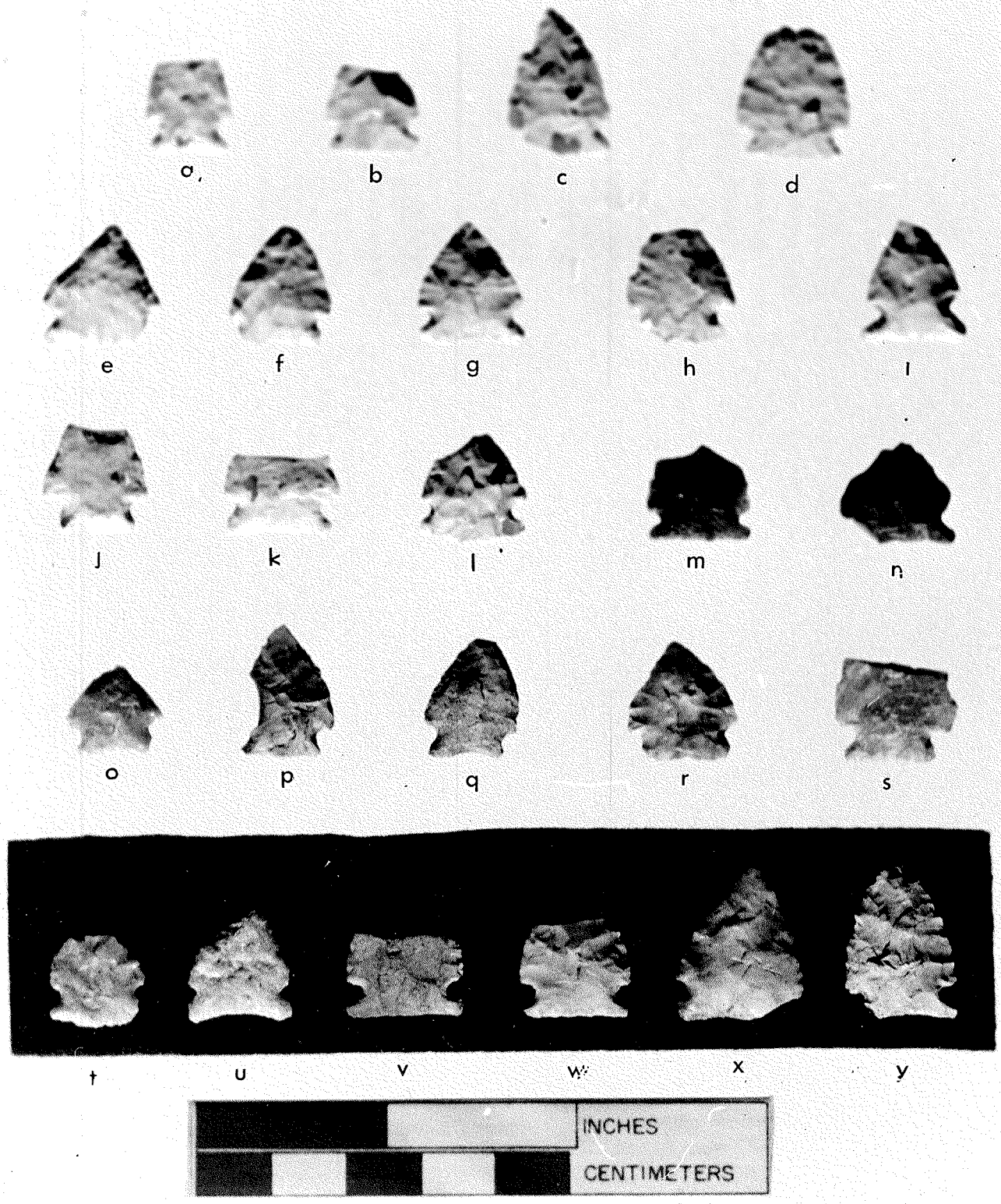

a
b
c
d
e
f
g
h
i
j
k
l
m
n
o
p
q
r
s
t
u
v
w
x
y
INCHES
CENTIMETERS

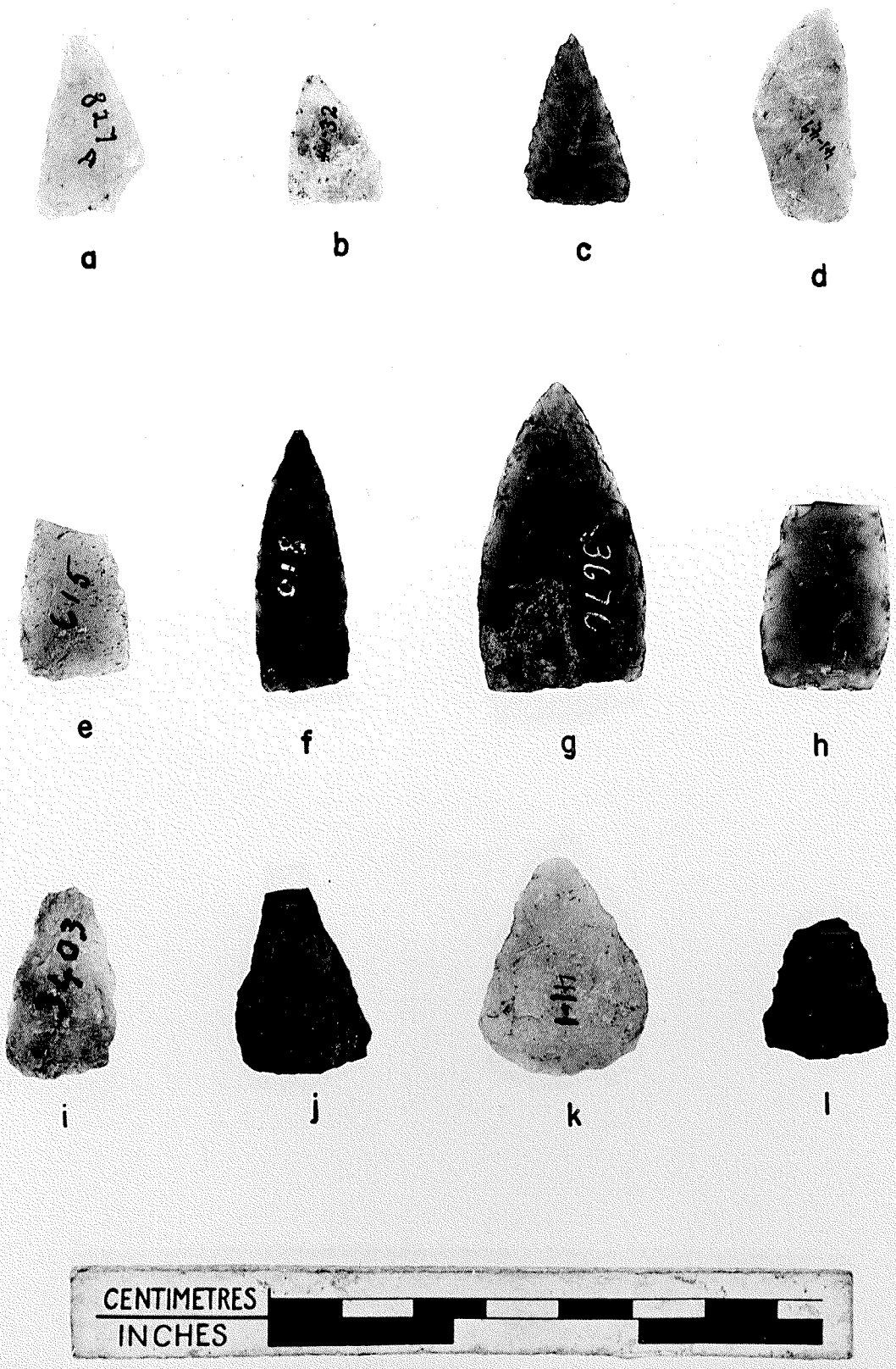
Plate 7

Plains Triangular Points

a-d. Variety 1 Points

e-h. Variety 2 Points

i-l. Variety 3 Points


a
b
c
d
e
f
g
h
i
j
k
l
CENTIMETRES
INCHES

a

b

c

d

e

f

g

h

i

j

k

l

m

n

o

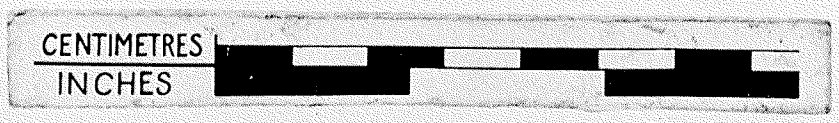


Plate 8

Late Side-Notched Points

a, b. Variety 1 Points

c, d. Variety 2 Points

e, f. Variety 3 Points

g, h. Variety 4 Points

i, j. Variety 5 Points

k, l. Variety 6 Points

m - o. Variety 7 Points

Plate 9

End Scrapers and Drills

a-d. Plano-Convex End Scrapers

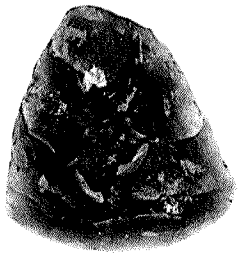
e-h. Prismatic End Scrapers

i-j. Lamellar End Scrapers

m, n. Drills

o, p. Split Pebble End Scrapers

a



b

c

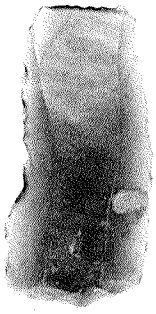
d

e

f

g

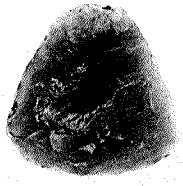
h



i

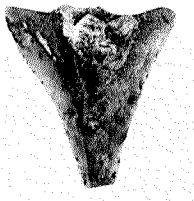
j

k

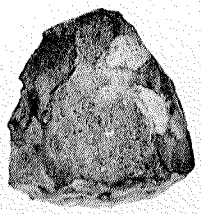


l

m

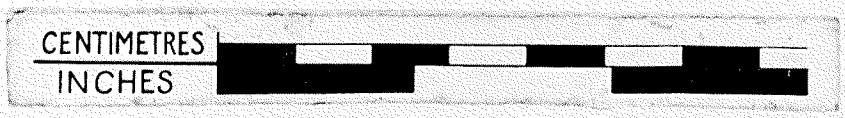


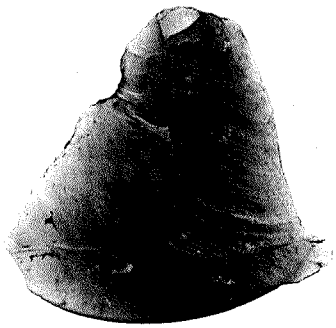
n



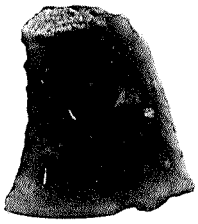
o

p





a



b

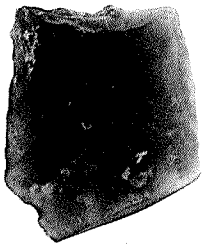
c

d

e

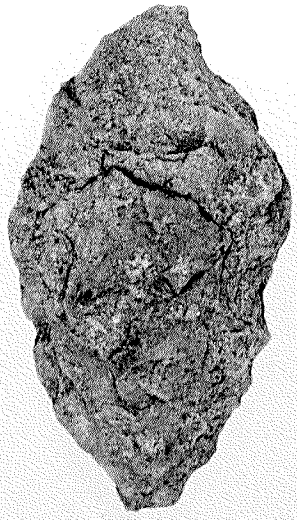
f

g



h

i



j

k

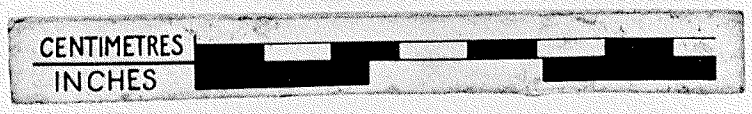


Plate 10

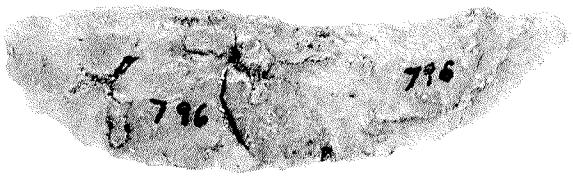
Side Scrapers and Large Scrapers

a-d. Lamellar Side Scrapers

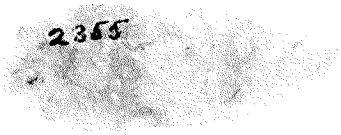
e-h. Prismatic Side Scrapers

i-k. Large Scrapers

a



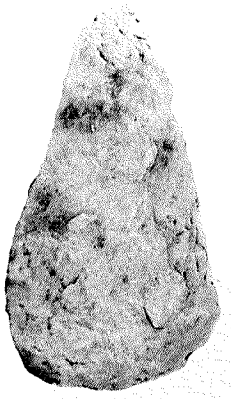
b



c

d

e



f

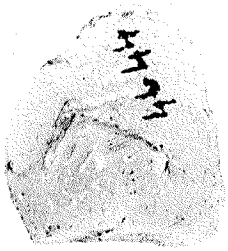
g

h

i

j

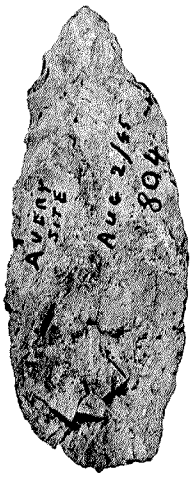
a



b

c

d



e

f

g

h

i

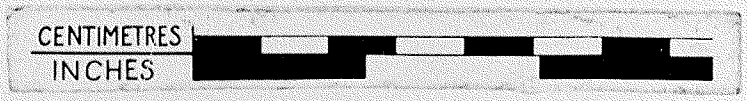


Plate 12

Bifaces

a-c. Oval Bifaces

d-f. Lanceolate Bifaces

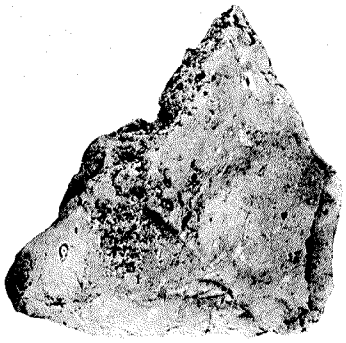
g-i. Rectangular Bifaces

Plate 13

Bifaces

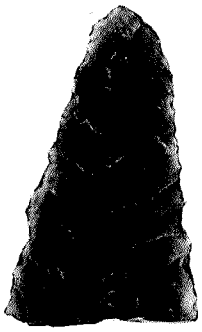
a-h. Miscellaneous Bifaces

a



b

c



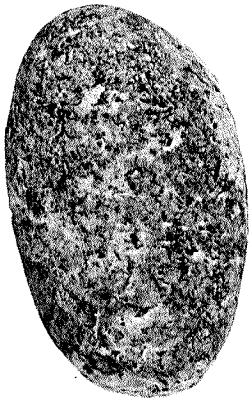
d

e

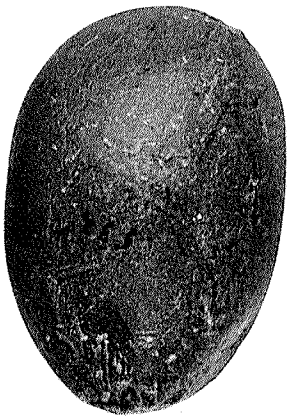
f

g

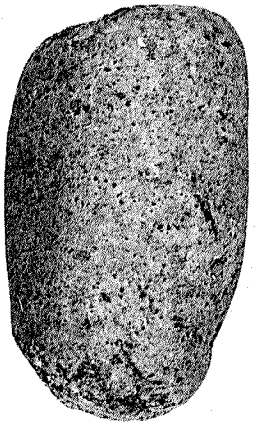
h



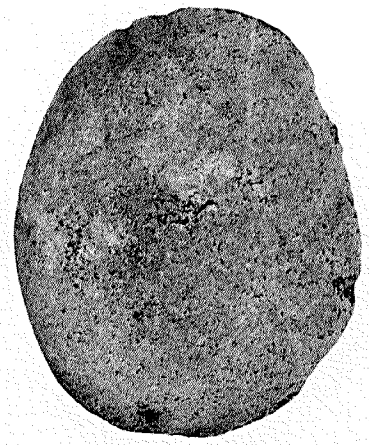
a



b



c



d

e

f

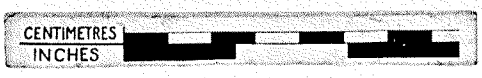


Plate 14

Pebble Hammerstones and Choppers

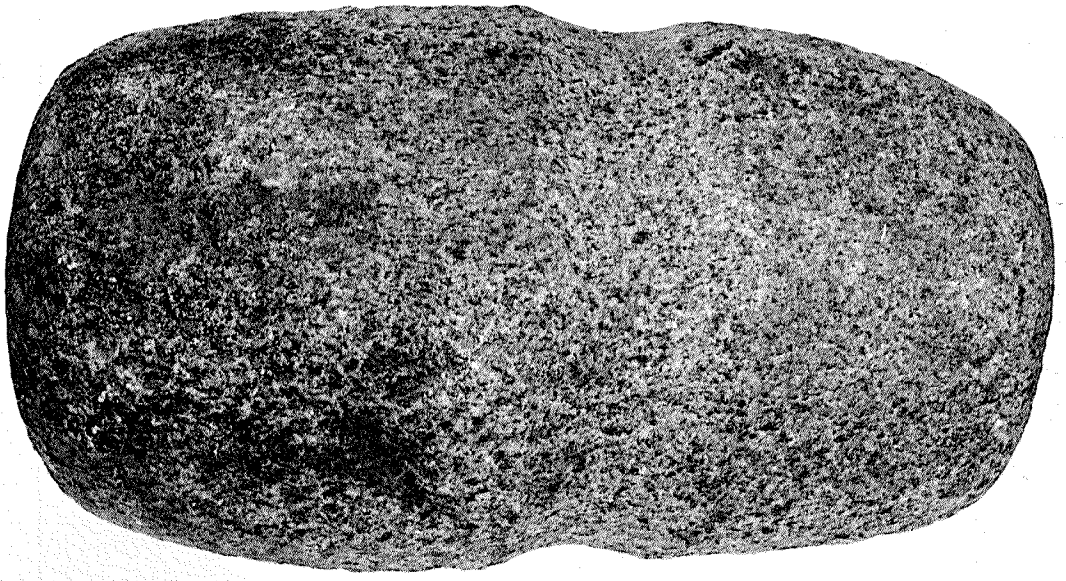
a-c. Pebble Hammerstones

d-f. Choppers

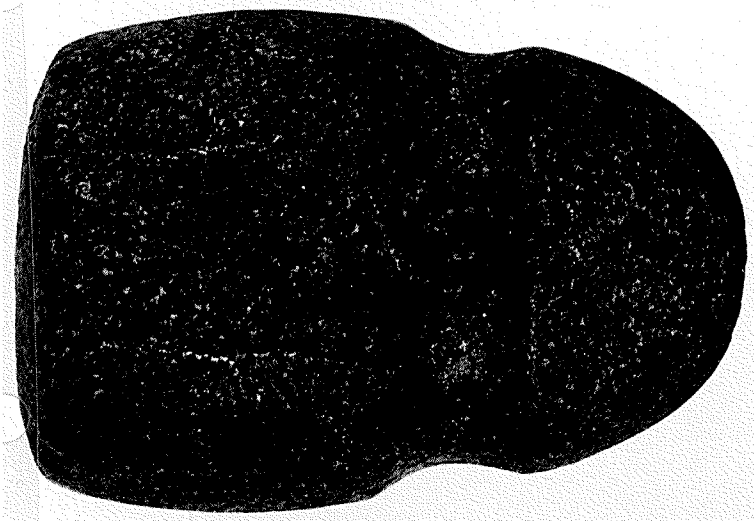
Plate 15

Grooved Mauls

a-c. Grooved Mauls



a



b

c

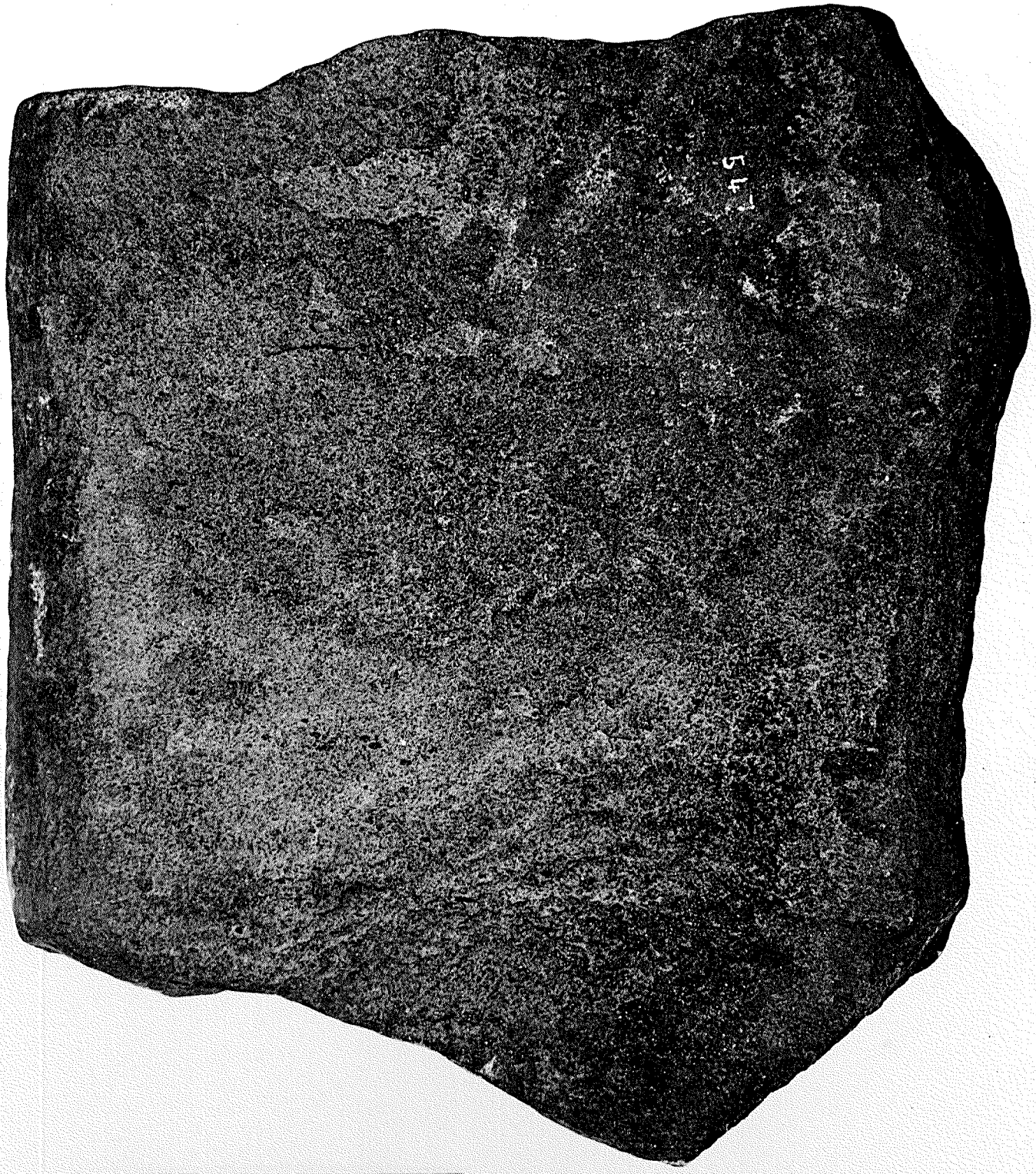

CENTIMETRES
INCHES

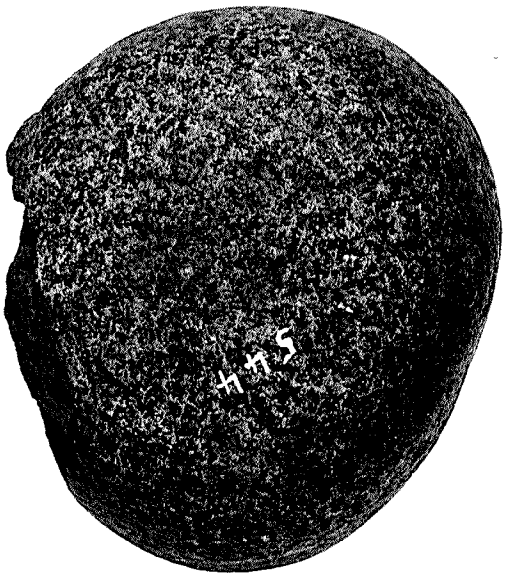
Plate 16

Anvil Stone

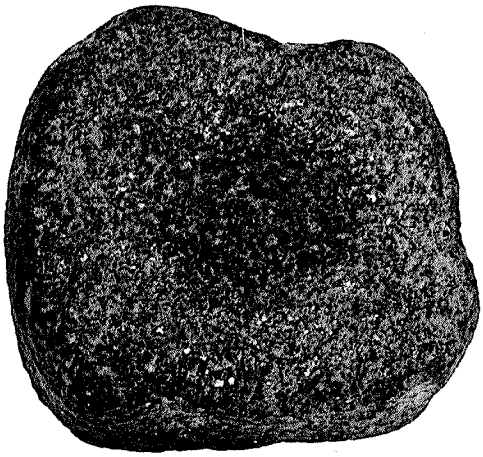
Plate 17

Rubbing Stones

a-d. Rubbing Stones

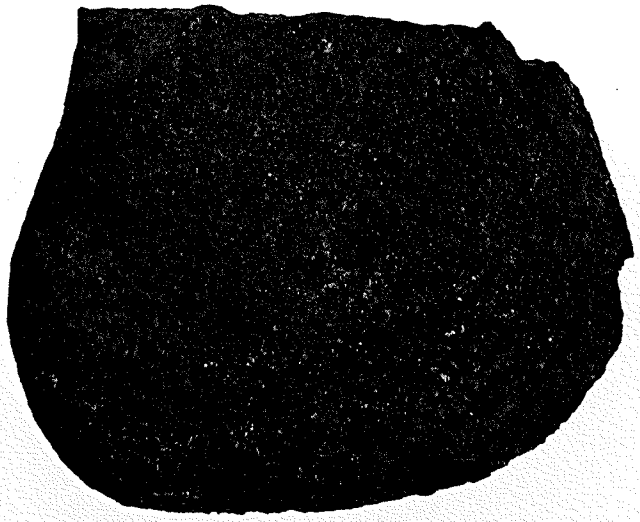


a

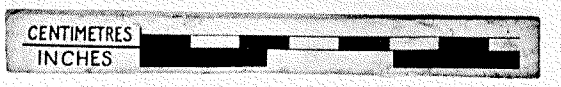


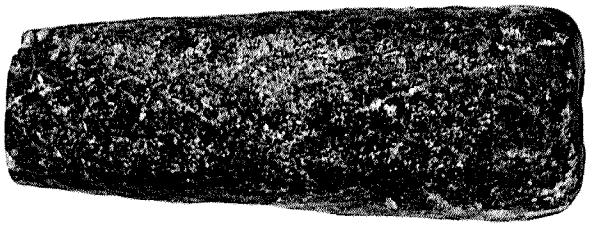
b

c



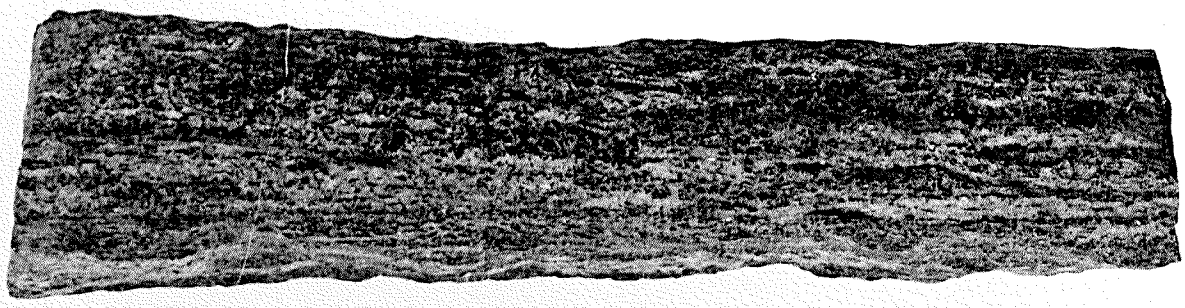
d





a

b



c

Plate 18

Heavy Stone Tools

a. Steatite Tube

b. Pestle

c. Irregular Percussion Tool

Plate 19

Body Sherds

a: Plain

b, c: Cord-Wrapped Paddle Impressed

d, e: Linear Stamped

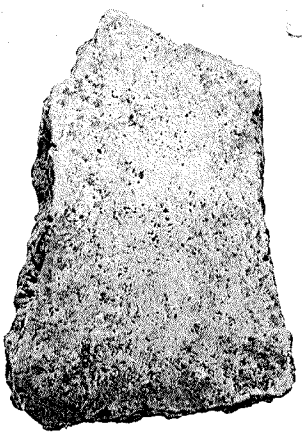
f, g: Fabric Impressed

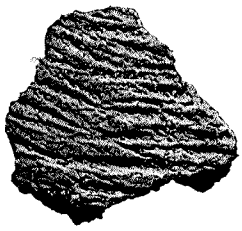
h, i: Simple Stamped

j, k: Dentate Stamped

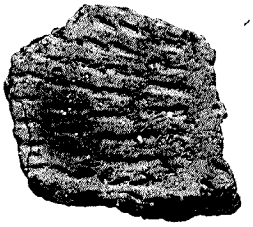
l-o: Punctate

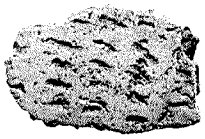
p: Incised

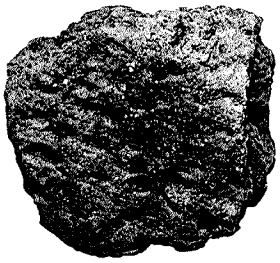

a


b

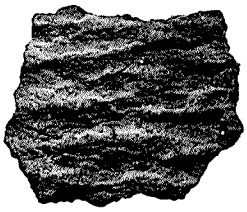

c

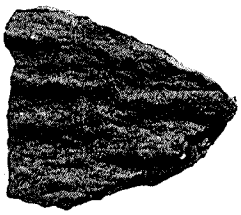

d


e

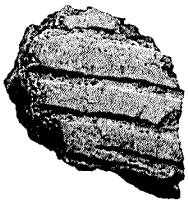

f

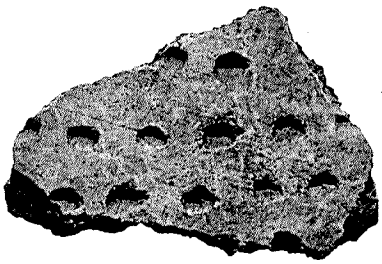

g

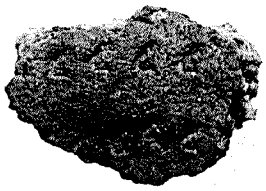

h

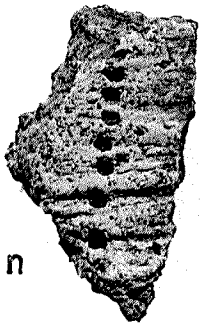

i

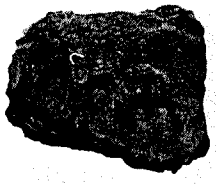

j

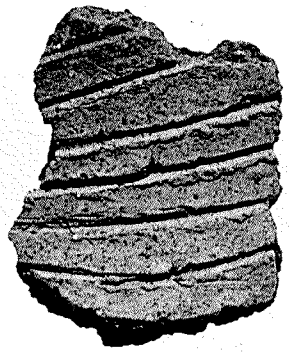

k

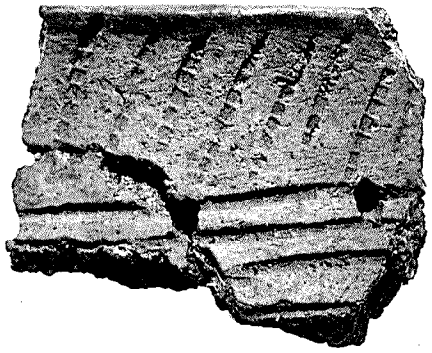

l


m

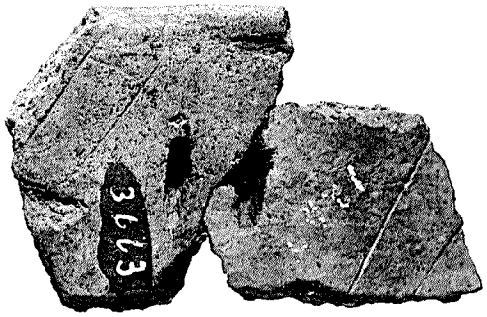

n


o


p

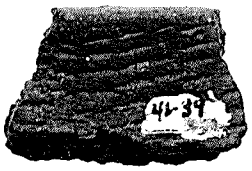


a



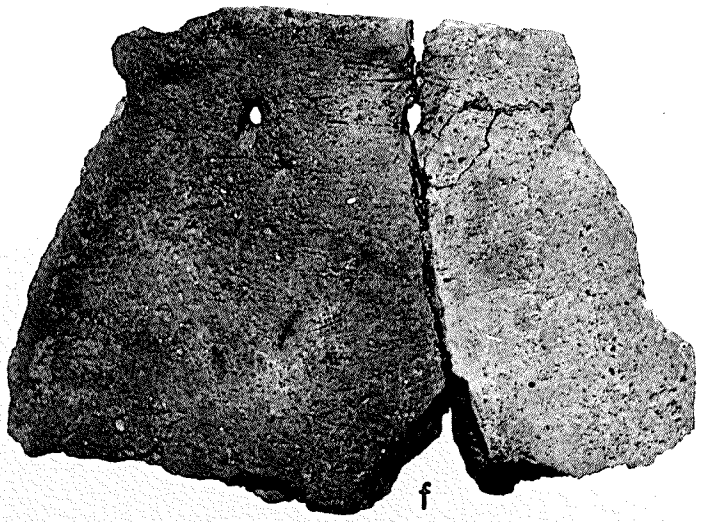
b

c



d

e



f

Plate 20

Laurel Ware

a: Laurel Dentate

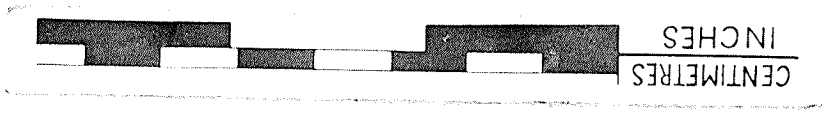
b, f: Laurel Plain

c-e: Lockport Linear

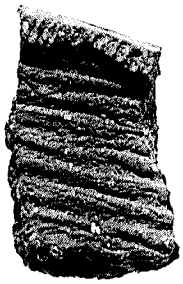
Plate 21

Avery Corded Ware

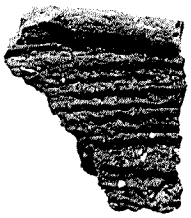
a-g: Avery Corded Ware



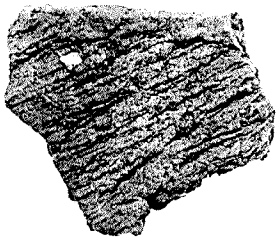
a



b

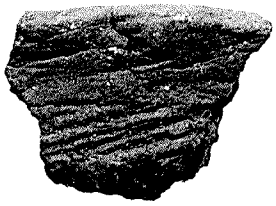


c

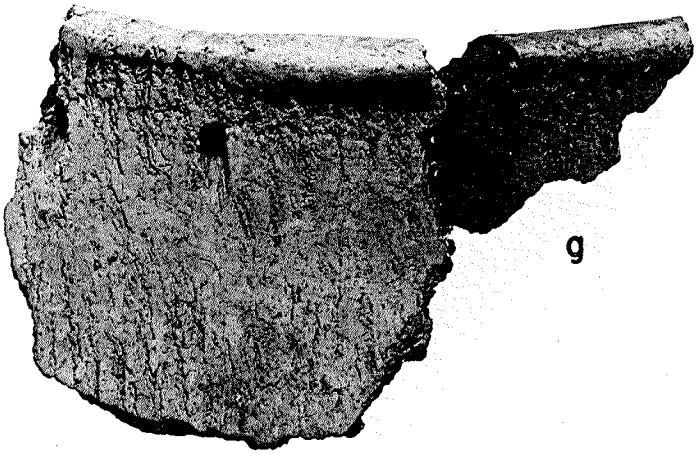


d

e



f



g


INCHES
CENTIMETERS

Plate 22

Truman Plain Rim Ware

a-g: Truman Plain Rim Ware

Plate 23

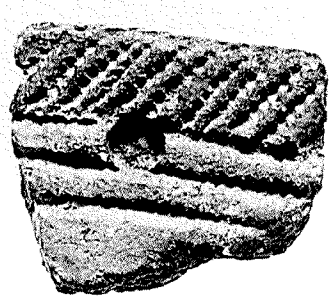
Blackduck and Winnipeg Fabric Impressed Wares

a: Manitoba Horizontal

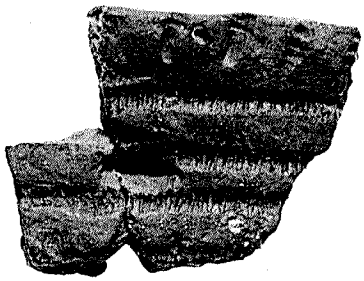
b: Stott Triangular

c: Nett Lake Vertical Cord

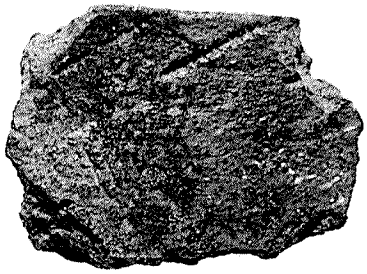
d-i: Alexander Fabric Impressed



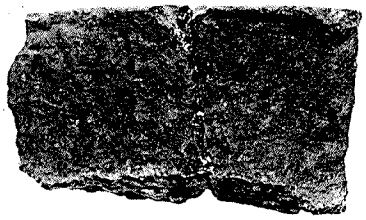
a



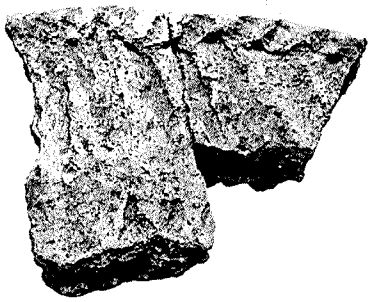
b



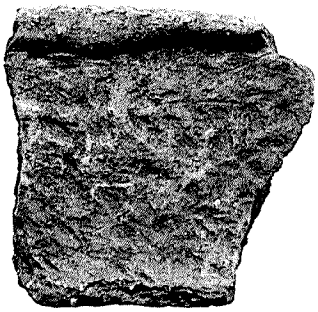
c



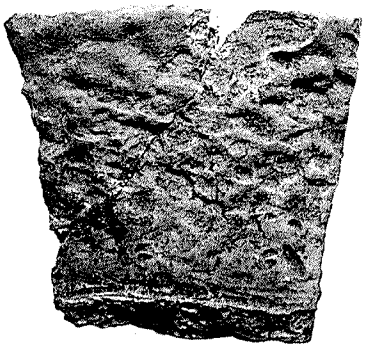
d



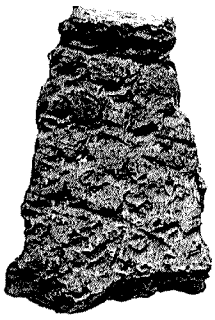
e



f



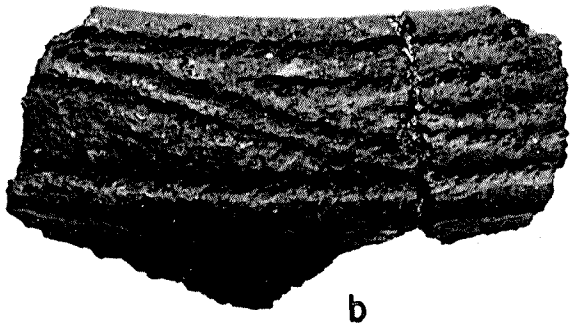
g



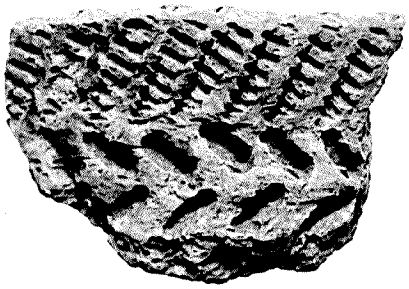
h

i

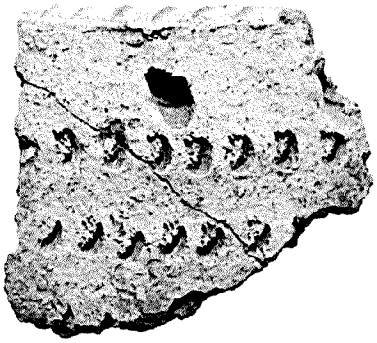
a



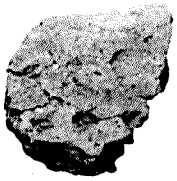
b



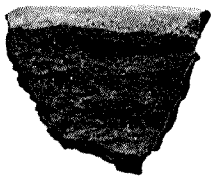
c



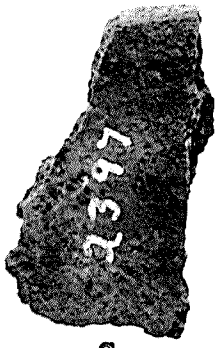
d



e



f



g

h

Plate 24

Aberrant Sherds

a, b: Fort Yates Cord Impressed

c: Paddle-Edge Impressed

d, e: Punctate

f-h: Plain

Plate 25

Aberrant Sherds

a, b: Sand Tempered

c, d: Punctated and Cord Impressed

e-h: Castellated Sherds

CENTIMETRES
INCHES

a

b

c

d

e

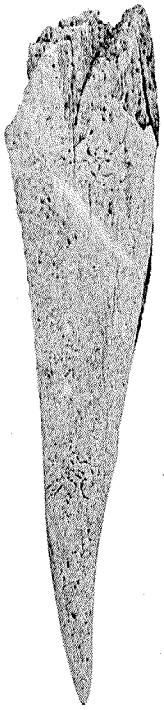
f

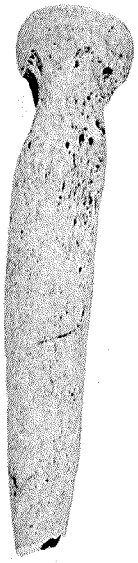
g

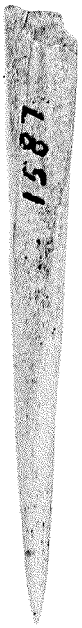
h


CENTIMETRES
INCHES


a


b


c


1587
d


e


f


g


h

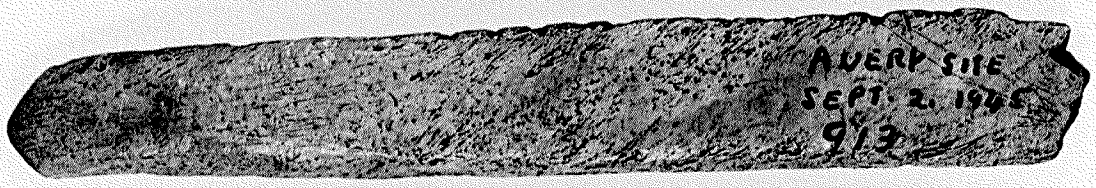

AVERY SITE
SEPT. 2. 1965
913
i

Plate 26

Bone and Antler Tools

a: Rib Bone Awl

b: Splinter Awl

c: Metapodial Awl

d: Antler Awl

e: Antler Flaking Tool

f: Rib Bone Flaking Tool

g-i: Spatulas

Plate 27

Bone Tools

a: End Scraper Handle (Ventral Side)

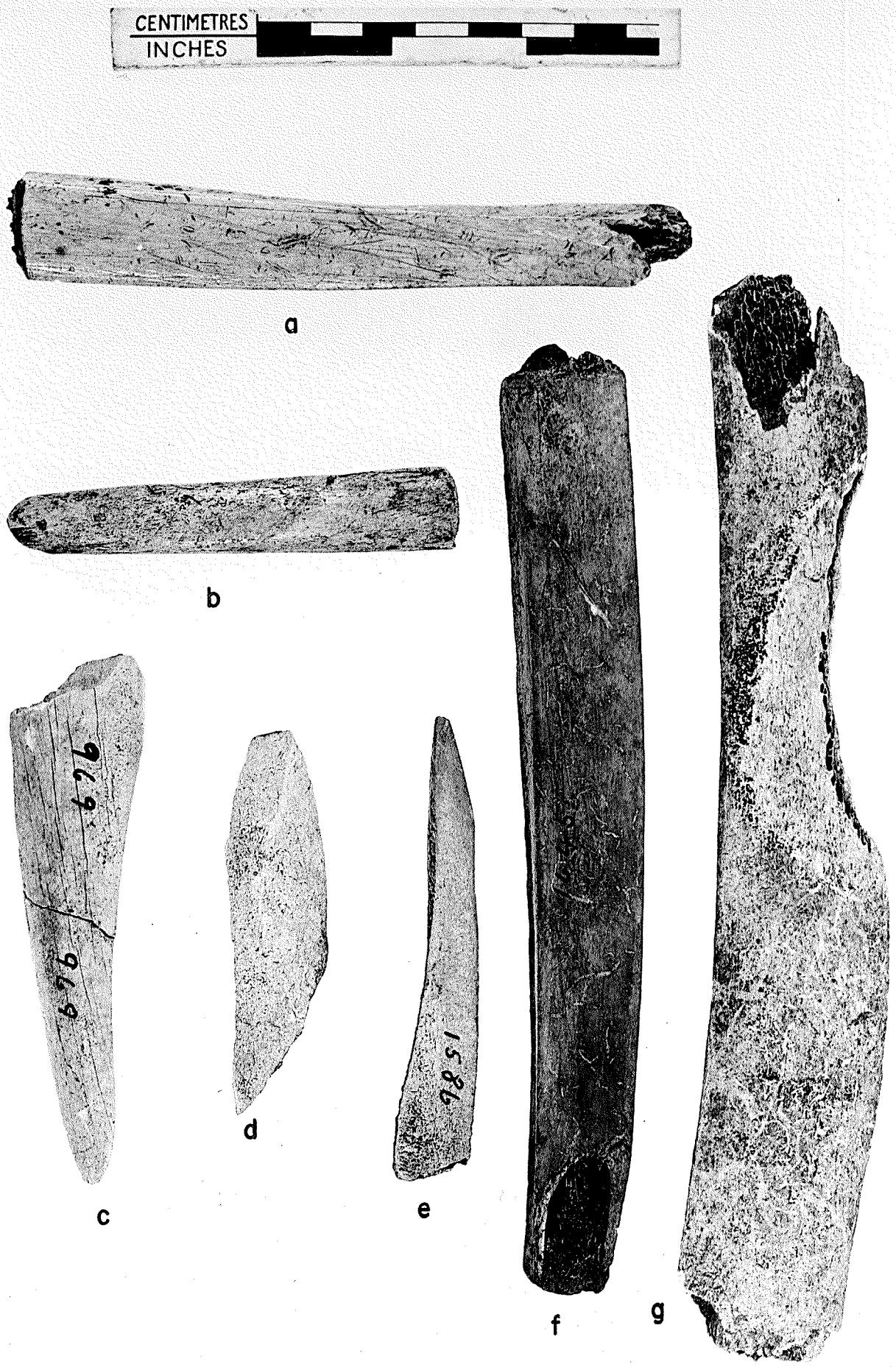
b: End Scaper Handle (Dorsal Side)

c: Fragment of Fleshing Tool

d, e: Knives

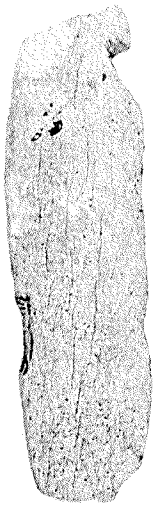
f: End Scraper Handle (Ventral Side)

g: Beaming Tool


CENTIMETRES
INCHES
a
b
c
d
e
f
g

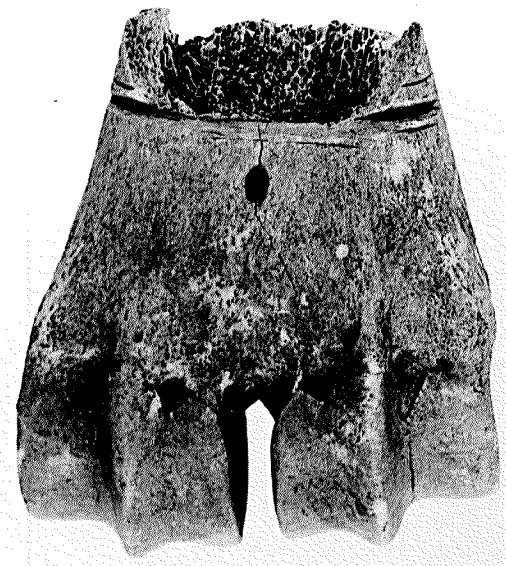
a

b

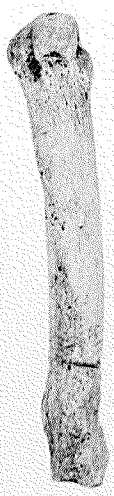


c

d



e



f

g

h

i

j

Plate 28

Bone Tools

a-d: Unilaterally Barbed Points

e: Cut Bison Metacarpal

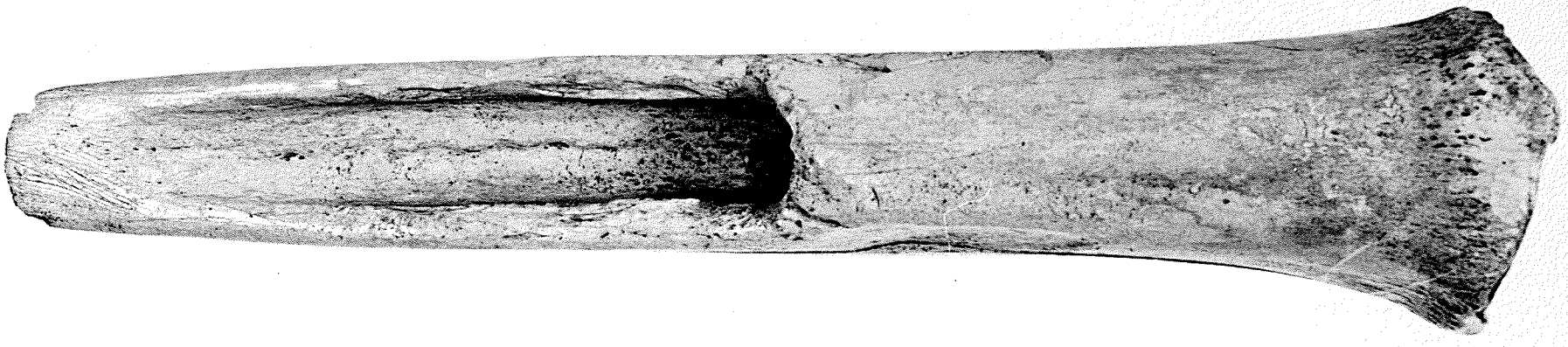
f, g, i: Cut Canid Metapodials

h: Cut Antler Tip

j: Beaver Tooth Gouge

Plate 29

Fleshing Tool




CENTIMETRES
INCHES

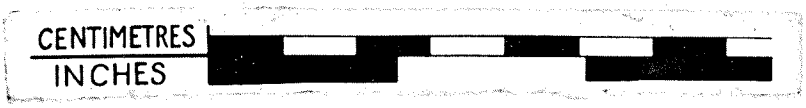
Plate 30

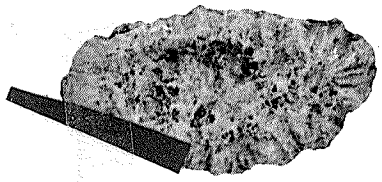
Miscellaneous Ar[redacted]ts

a-g: Shale Disks

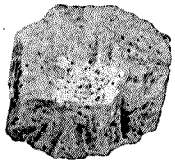
h: Fragment of Pipe Bowl

i: Large Point or Biface





a

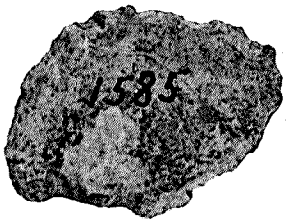


b

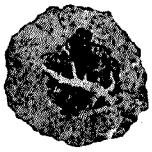
c

d

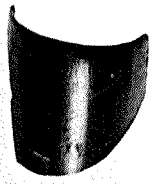
e



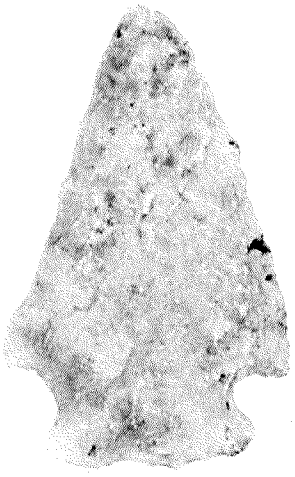
f



g



h



i