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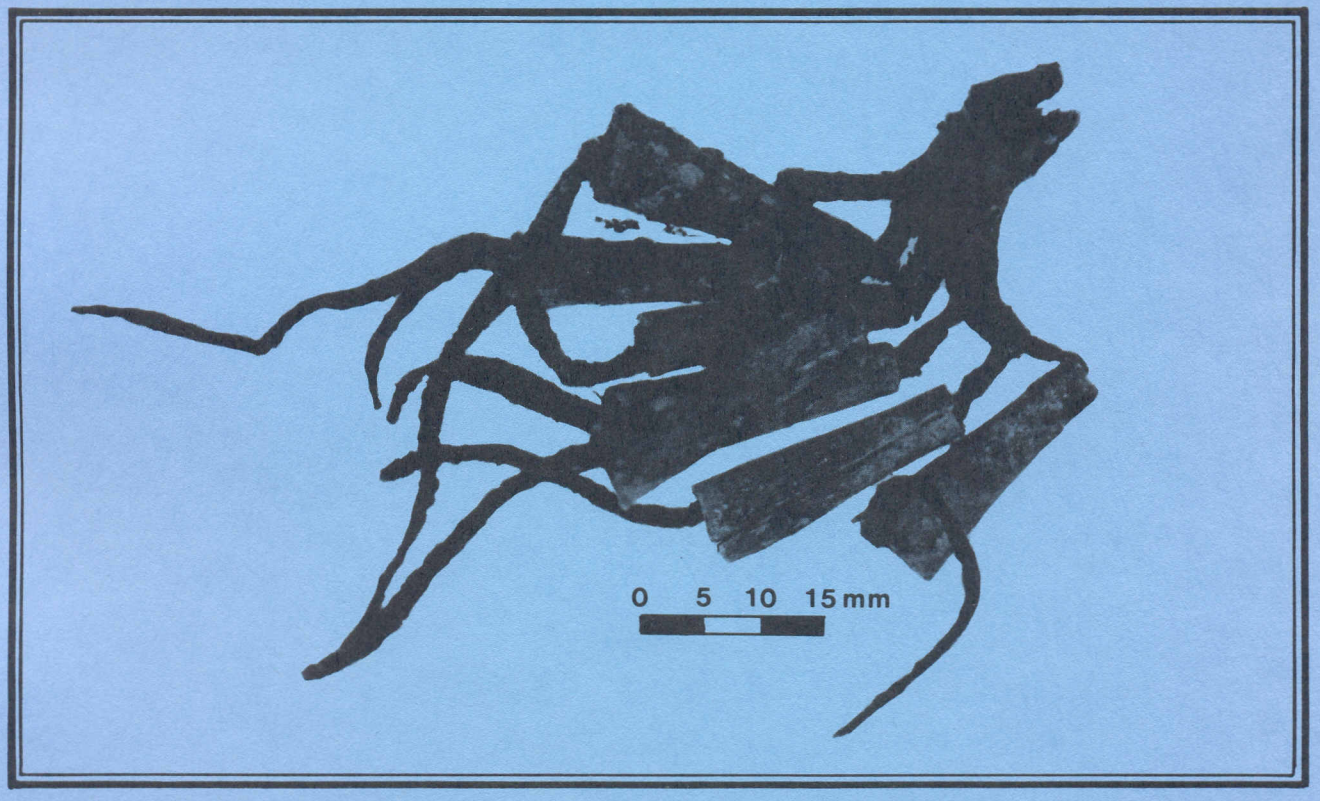
THE ELK POINT BURIAL

Stuart J. Baldwin



Alberta
CULTURE
Historical Resources

THE ELK POINT BURIAL
"AT THE PLACE OF THE WILLOWS," ALBERTA

By
Stuart J. Baldwin
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Archaeological Survey of Alberta
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Objectives

These Occasional Papers are designed to permit the rapid dissemination of information resulting from Historical Resources' programmes. They are intended primarily for interested specialists, rather than as popular publications for general readers. In the interests of making information available quickly to these specialists, normal production procedures have been abbreviated.

The cover illustration is a photograph, approximately X 1.7, of the cluster of seven brass "tinkling cones" strung on leather thongs, which was found in the birchbark-wrapped bundle found associated with the human remains from the archaeological site FlOr-1.

ABSTRACT

In October 1975, a human burial was located during construction activities in Elk Point, Alberta. It consisted of the flexed skeleton of a middle-aged male, with a bundle of artifacts in place under his head. Due to exceptionally good preservation, many perishables are present among these artifacts and a number of special analyses thus have been possible. As the result of full osteological, artifactual and contextual analyses the burial is dated to the first decade of the nineteenth century and the individual identified as probably a Cree, probably a medicine man and possibly a member of the Cree mite·wiwin society.

ACKNOWLEDGEMENTS

This report is, in a very real sense, a group effort, with a multitude of persons contributing expertise, advice and information. The Archaeological Survey of Alberta financed this project and provided necessary transportation and technical support. Special thanks go to J. Michael Quigg, of the Survey, for suggesting this project to me and for his unstinting support. Other members of the Survey, including William J. Byrne, Director, and Leon Galenza, draftsman-photographer, have contributed directly to the realization of this report. Facilities for the analyses, equipment and aid in their use were provided at the Department of Anthropology, University of Alberta, by D. Gentry Steele, Charles Schweger and Linda Alexander.

Cpl. B.B. Bishop, R.C.M.P., Elk Point Detachment, and Dr. K.C. Miller, Coroner at Elk Point, are to be thanked for information on the burial as it was found. At the University of Alberta, I thank Laraine Mehlenbacher, Department of Anthropology, and John Nicks, Department of History, for access to unpublished data. John Nicks also provided me with many insights regarding the fur trade and its artifacts.

Professional expertise was brought to bear on materials from the burial by many other people at the University of Alberta: J.M. Plecash, Faculty of Dentistry; E.G.A. Grimmer, Department of Agricultural Engineering; B.P. Dancik, Department of Forest Science; D.G.W. Smith, Department of Geology; and John Packer, Department of Botany; all deserve a hearty "thank you". Equally deserving of my gratitude are those persons in other institutions who aided me in so many ways: Marvin Rawluk of the Research Council of Alberta; Amadeo M. Rea of the Department of Ecology and Evolutionary Biology, University of Arizona; Jasper Keizer and Rod Burns of the Provincial Museum of Alberta; Wayne Davis of the Trade Bead Research Centre, B.C. Provincial Museum; and Roderick Sprague, Department of Sociology and Anthropology, University of Idaho.

Finally, Thelma Habgood and John Brink, Department of Anthropology, University of Alberta, and Gordon Gabert, Research Council of Alberta, are among the many others without those aid this project could not have been completed.

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AT THE PLACE OF THE WILLOWS: THE ELK POINT BURIAL

Early in October of 1975 a bulldozer unearthed a human skull while engaged in construction of a drainage ditch behind the new hospital at Elk Point, Alberta. The local R.C.M.P. Detachment was notified of the discovery and the construction site was visited by Cpl. B. B. Bishop, R.C.M.P., and Dr. K. C. Miller, Coroner. Further excavation revealed a single human skeleton accompanied by a bundle of artifacts and evidences of a fire. Artifacts exposed by a tear in the bundle were of recognizably "Indian" type, leading to the conclusion that the burial had been in place for a century or more. In order that construction could continue, the skeleton, artifacts, and a quantity of soil matrix was removed to the R.C.M.P. Detachment offices.

All materials from the burial site were transferred by the R.C.M.P. to the Archaeological Survey of Alberta, which subsequently turned them over to the Department of Anthropology at the University of Alberta for cleaning and study. After removal of the bones and artifacts from the soil matrix, the materials were eventually returned to the Archaeological Survey.

Aside from cataloguing, no further work was done on these materials until April of 1977, when the author undertook their analysis under a contractual Agreement with the Archaeological Survey.

Due to the unusually good preservation of normally perishable items in this burial, a number of special analyses were undertaken which have yielded good results. These, plus the unusual nature of the artifacts, present a remarkably detailed picture.

The biggest problem in dealing with the material has been the loss of detailed provenience data: (a) at the time of excavation, when the absence of supervision by a trained archaeologist caused a failure to record spatial arrangements resulting in uncertainty of the positions of some skeletal elements; and (b) at the time of removal of bones and artifacts from their soil matrix when the bundle of artifacts was opened, but no record made of the spatial arrangement of the artifacts

within the bundle. The latter instance is particularly upsetting in view of the fact that professional archaeologists were involved.

THE BURIAL

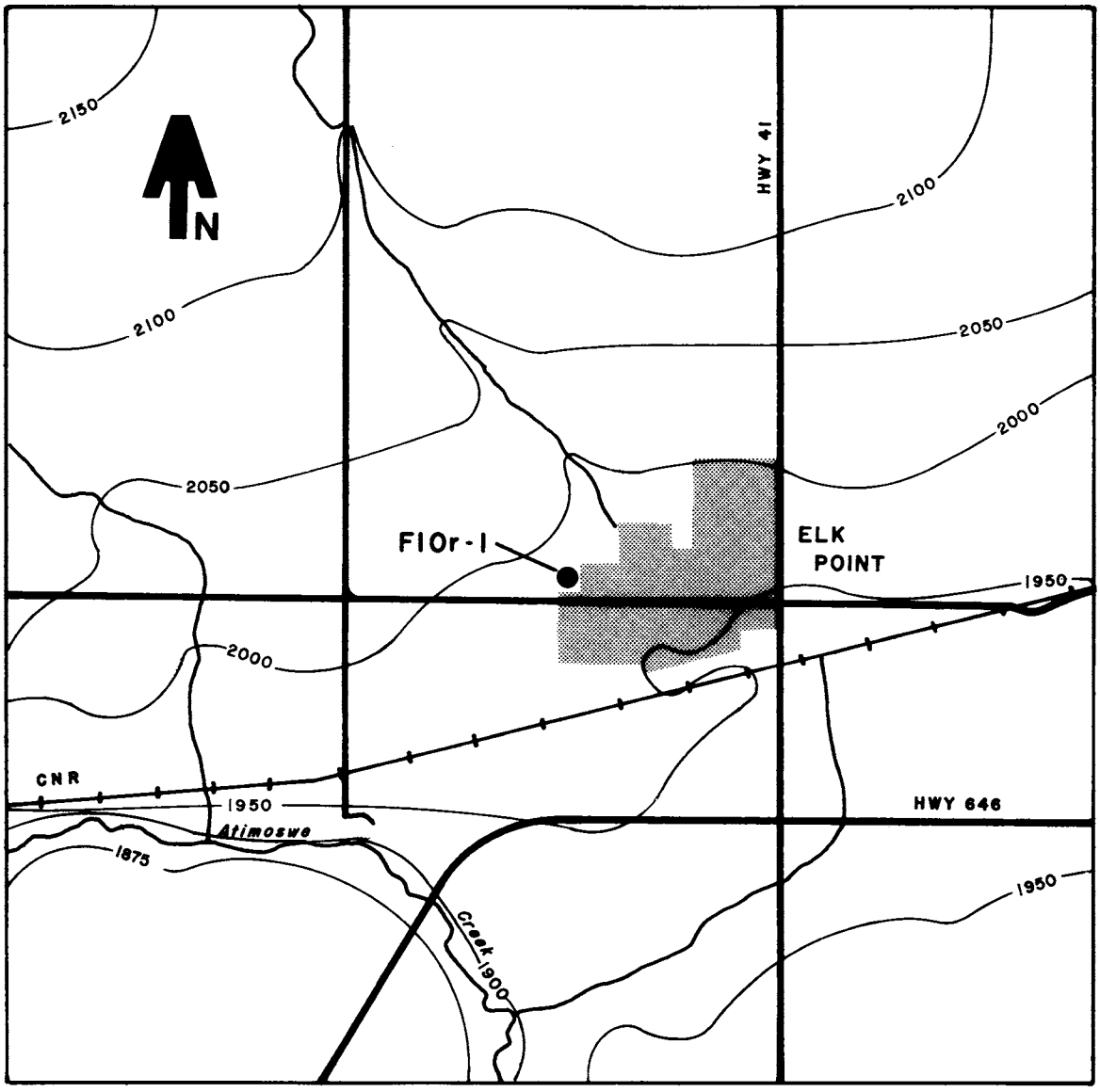
The Burial Site and Its Surroundings

The Elk Point Burial (FlOr-1) was found within the present limits of the Town of Elk Point, east central Alberta (see Fig. 1). The burial site is located immediately behind the new hospital, where a drainage ditch now passes through the original position of the burial. Immediately northeast of this spot is a grove of aspen (Populus tremuloides) with willow underbrush (Salix sp.) and a few old spruces (Picea sp.); to the northwest is an open grassy area, now partly occupied by a mound of earth excavated during construction of the new hospital; immediately to the south is the new hospital and its grounds. Before modification, the general trend of the land surface appears to have been a gentle slope from the N N W down towards the S S E. Not far distant to the east is a small creek which trends in the same direction. Dr. Miller states that this location is quite wet, with ground water always found within a few feet of the surface. He notes that this area is known to the local Cree as "Place of the Willows", due to the general shrub-willow underbrush.

The burial site is 4.2 km (2.6 mi.) north of the North Saskatchewan River, and 1.4 km (7/8 mi.) northeast of Atimoswe Creek, but is located outside of and above their alluvial valleys on a slightly rolling plain of glacial till (Univ. Alberta 1969:8). The present vegetation of this area (as surveyed in 1965) is aspen forest with less than 50% cultivation (Univ. Alberta 1969:28-29; see also: North 1976).

The Burial: a unit of study

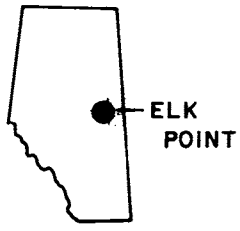
A burial may be conceived of as a discrete unit of study, wherein the spatial relationships between the bones and artifacts may be interpreted as demonstrating and defining the circumstances and manner of burial. Accurate and detailed knowledge of these spatial relationships thus is of critical importance for interpretation. Unfortunately, as noted previously, provenience information for the burial in situ is incomplete due to inadequate recording. However, a reasonably accurate



SITE PLAN OF

ELK POINT BURIAL

FlOr - 1



SCALE: 1:50,000

picture of the burial at time of discovery has been produced by collation of information from three sources: (a) a brief description of the burial submitted to the Archaeological Survey by Cpl. Bishop in October 1975, (b) supplementary information provided to me in April 1977 by Cpl. Bishop and Dr. Miller, who were both involved in excavation of the burial, and (c) a photograph of the burial *in situ* taken by Cpl. Bishop (Fig. 2).

Cpl. Bishop and Dr. Miller are agreed that no burial pit was visible at the time of excavation. The burial was shallow, with the skull only about 6 inches below the surface, whereas the pelvic region was at a depth of about 1½ feet below the surface. That the skull was higher than the rest of the body seems confirmed by the fact that it was the only portion of the skeleton turned up by the bulldozer.

The burial is a primary inhumation: Dr. Miller stated that the skeleton was in an articulated postion, which is confirmed by the photograph (Fig. 2). The skeleton lay on its left side, with the skull to the northwest and the feet to the southeast; it should be noted that this position oriented the axis of the body along the prevailing slope of the land surface (northwest to southeast). The legs were flexed, with the knees pointing northeast. The orientation of the left arm is unknown; from the photograph it is apparent that the right arm lay extended parallel to the axis of the body, with the wrist above the proximal end of the right femur. The position of the hands is not known.

The exact position of the skull is uncertain due to its disturbance by the bulldozer. However, immediately below the expectable position of the skull (given an articulated burial) was the bundle of artifacts, consisting of a variety of artifacts wrapped in several pieces of birch bark. On one of the exterior pieces of birch bark is a red ochre stain; a matching red ochre stain is present on the exterior protuberance and nuchal lines of the occiput of the skull. It seems quite possible that these two stains indicate the point of contact between the skull and the birch bark of the bundle. The question may be raised as to how the skull may be stained with red ochre if the burial was a primary inhumation. I submit that if the head of the individual was turned to the right at the time of burial, so that it was facing upwards, and if the individual's hair was painted with red ochre (as is known from ethnographic records

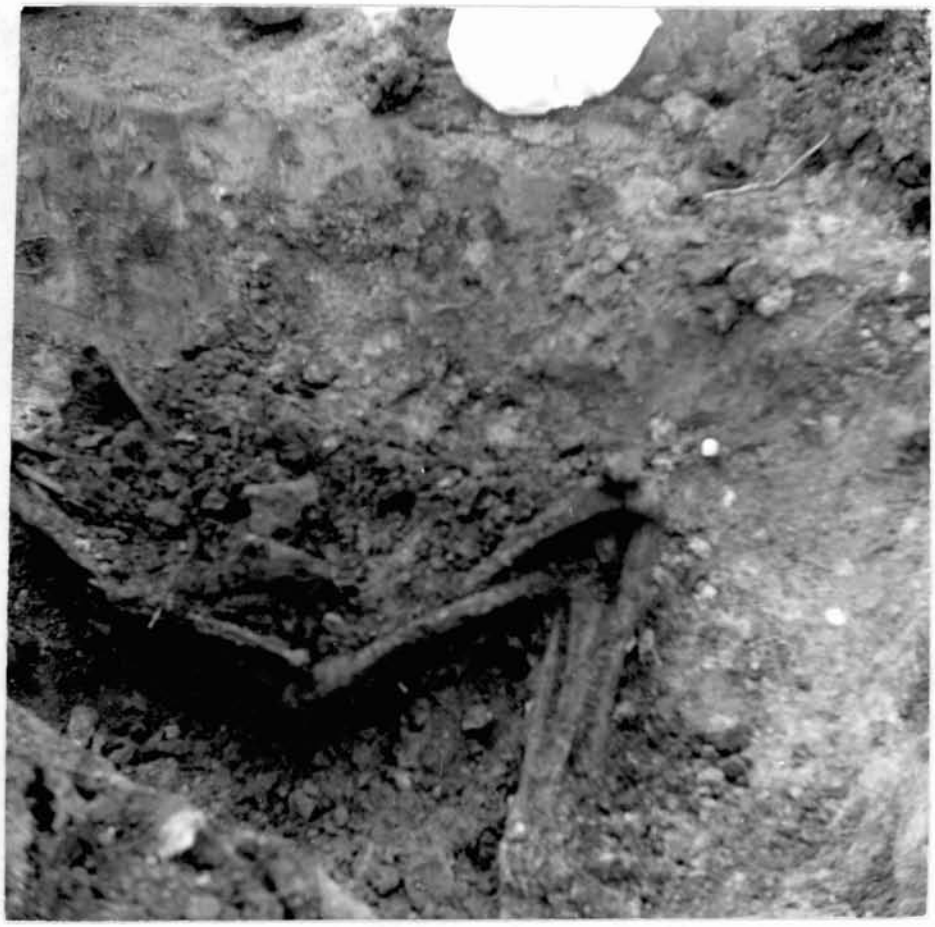


Figure 2. Elk Point Burial *in situ*. Photograph courtesy of Cpl. B.B. Bishop, R.C.M.P.

to have been a common practice on the Northern Plains), then at the point of contact between head and artifact bundle, red ochre might remain which would come into contact with the skull once hair and flesh had decayed away. In fact, this reconstruction is the only one I can conceive which will reconcile a primary burial with the presence of ochre on the occiput. And I should stress that the occiput is the only portion of the skeleton with adhering ochre.

According to the statements of Cpl. Bishop and Dr. Miller, the birch bark-wrapped bundle of artifacts included all of the artifacts present in the grave.

An unusual feature is the evidence of a fire within the grave: charcoal and ashes were present in the area anterior to the pelvis and thorax, and two large rocks (visible in Fig. 2) had been placed over these remnants of the fire. There can be no doubt that a fire burning some woody material was lit within the grave after deposition of the body and before covering of the body with earth: (a) smears of charcoal and ash are present in liberal quantities on the bones of the pelvis, legs, arms, and thorax; (b) charcoal with a woody texture is present in earth adhering to the left humerus; and (c) there are pinpoint burns on many of the bones, most of them on surfaces which would have faced upwards or outwards from the body after it had been positioned in the grave. This latter point demonstrates that the body was in the grave during the fire, while the positions of the burns and their pinpoint nature suggest the action of red-hot coals. Furthermore, the complete lack of calcined bone or large areas of carbonized bone supports the likelihood that flesh covered the skeleton at the time of the fire.

The two rocks which were placed over the remnants of the fire were discarded by the excavators. However, from the photograph (Fig. 2) it appears that they were rough and angular - if anything, they appear to be fire-cracked rocks. Here it should be stressed that Cpl. Bishop feels certain that these rocks were put in place after the fire had occurred.

The burial appears to be an isolated unit: both Cpl. Bishop and Dr. Miller stated that no other cultural materials have been found at or near the burial site. Mr. Steve Andrucek, a local collector, also

stated that he had never found anything in the vicinity of the burial site. However, Dr. Miller, who has lived in Elk Point most of his life, has a vague memory of another burial being found at some time in the past on the grounds of the old hospital - which would place it approximately 100 to 200 yards south of the known burial. The cultural affiliation of this putative second burial is unknown.

OSTEOLOGICAL ANALYSIS

The human skeletal material from the Elk Point Burial represents a single individual: a male, about 5'8" (174.5 cm) tall, roughly 40 to 50 years of age at time of death, cause of death unknown. As far as can be determined, the whole of his skeleton was present at the time of burial; but deterioration in situ, bulldozer action, and unsystematic excavation caused the breakage and loss of some small amounts of skeletal material. Preservation is generally good for the skull and right side of the body, while the left side tends to be fragmentary and relatively poorly preserved. The disparity in preservation appears to result from the body's position in the grave: bones of the left side suffering the greatest weight stress during decomposition and the resulting settling of the overlying soil.

The Cranial Remains

The vault of the cranium was struck and shattered by the blade of the construction bulldozer, resulting in complete loss of the left half of the frontal, most of the left parietal, and portions of the left temporal and left half of the sphenoid. Presumably these portions of the cranium are somewhere in the large backdirt pile behind the new Elk Point hospital. Other damage to the skull includes breakage of the surviving portion of the frontal and of the right parietal, and a small amount of warping along the lambdoid suture due to the force of impact. Because of this damage, many of the usual metrical observations on the vault and face of the skull could not be made; those which were possible are recorded in Table 1.

Aside from the major damage noted above, the bones of the skull and mandible are generally intact; the hyoid is missing. There is no artificial deformation of the skull. Most of the sutures of the cranial vault had completely closed endocranially, but ectocranially there is wide

TABLE 1

ELK POINT BURIAL: CRANIAL METRICS AND INDICES

Name of Measurement		Measurement	Authority for Measurement
Basion-Porion Height:		21.7 mm	Bass (1971:66)
Basion-Alare Length:	(right)	90.0 mm	Bass (1964:79)
	(left)	88.1 mm	
Basion-Medial Length:	(right)	78.0 mm	Bass (1964:79)
	(left)	78.5 mm	
Basion-Lateral Length:	(right)	86.5 mm	Bass (1964:80)
	(left)	83.0 mm	
Basi-Alveolar Length:		100.0 mm	Brothwell (1963:79)
Basion-Gnathion Length:		107.1 mm	Bass (1964:78)
Porion-Lower Orbit Length:	(right)	93.0 mm	Bass (1964:80)
	(left)	93.0 mm	
Porion-Prosthion Length:	(right)	125.5 mm	Bass (1964:80)
	(left)	127.2 mm	
Porion-Gnathion Length:	(right)	144.5 mm	Bass (1964:80)
	(left)	140.7 mm	
Bizygomatic Breadth:		147.5 mm	Bass (1971:67)
Bimaxillary Breadth:		108.0 mm	Brothwell (1963:81)
Nasal Breadth:		24.3 mm	Bass (1971:68)
Orbital Breadth:	(right)	46.1 mm	Bass (1971:69)
	(left)	46.5 mm	
Biorbital Breadth:		107.1 mm	Bass (1964:79)
Maxillo-Alveolar Length:		58.1 mm	Bass (1971:70)
Maxillo-Alveolar Breadth:		66.3 mm	Bass (1971:70)
Palatal Breadth:		43.1 mm	Bass (1971:71)
Bicondylar Breadth:		128.0 mm	Bass (1971:72)
Bigonial Breadth:		112.0 mm	Bass (1971:72)
Height of Ascending Ramus:	(right)	59.0 mm	Bass (1971:72)
	(left)	59.9 mm	
Minimum Breadth of Ascending Ramus:	(right)	37.5 mm	Bass (1971:72)
	(left)	38.7 mm	
Height of Mandibular Symphysis:		31.7 mm	Bass (1971:72)
Foramen Mentalia Breadth:		43.5 mm	Brothwell (1963:82)
Maximum Mandibular Length:		110.0 mm	Brothwell (1963:84)

TABLE 1 - Continued

Name of Measurement	Measurement		Authority for Measurement
Gonion-Gnathion Length:	(right)	92.5 mm	Bass (1964:80)
	(left)	91.0 mm	
Mandible Angle:		115.5°	Krogman (1962:115)
Occipital Arc:		125.0 mm	Brothwell (1963:81)
Occipital Chord:		100.0 mm	Brothwell (1963:82)
Foraminal Length:		36.2 mm	Brothwell (1963:82)
Foraminal Breadth:		28.2 mm	Brothwell (1963:82)
Biasterionic Breadth:		112.2 mm	Brothwell (1963:82)
Mastoid Length:	(right)	37.5 mm	Giles & Elliot (1963)
	(left)	35.0 mm	

INDICES: only one index could be computed:

Maxillo-Alveolar Index = 114.11 (Mesuranic) Bass (1971:71)

variation in the amount of closure. Discrete traits of the cranium are as follows:

- Metopism: slight; open ectocranially only, from glabella to nasion; a complex suture which includes a metopic bone (naso-frontal);
- Pterion: only observable on the right side, it has the usual H-pattern;
- Wormian Bones: two large Wormian bones are present along the left half of the lambdoid suture; a small one is present along the right half of this suture;
- Parietal Notch Bone: a large one is present on the right side; absent on the left side;
- Parietal Foramina: not observed due to breakage;
- Supraorbital Tori: right - medium, centred over the medial edge of the orbit; left - apparently the same, but breakage makes observation uncertain;
- Supraorbital Foramen: present on right; not observed on left due to breakage and loss;
- Orbit Morphology: squared, with rounded margins;
- Posterior Root of Zygomatic Arch: a crest extends to the posterior edge of the temporals on both sides;
- Mastoid Foramen: present on both sides;
- Canine Fossa (Suborbital Fossa): deep on both sides;
- Torus Palatinus: there is evidence of such a torus;
- Gonial Angles: slightly everted;
- Occipital Condyles: double-faceted, but with a continuous articular surface.

Thirty teeth, out of an original 32 teeth, were recovered from the burial: the right I^2 appears to be the only tooth lost during excavation, whereas the other missing tooth, the left PM_3, seems to be a pre-mortem loss (see discussion under "Benign Abnormalities", below). The most extensive pathology present on the skeleton of the Elk Point Burial is that associated with the dentition (see description under "Pathologies",

below). Brothwell (1963:119) notes the 'shovel-shaped' morphology in incisors as "being particularly prevalent in the median incisors". The reverse seems to be the case for the Elk Point skeleton, where the medial upper incisors lack 'shoveling', while the surviving lateral upper incisor has a pronounced 'shovel-shape' (the lower incisors are too worn to show the trait). Fitting of the mandible to the skull shows a slight overbite.

The Post-Cranial Remains

A more complete series of measurements was possible on the post-cranial remains (see Table 2), although some bones (scapulae, sternum, sacrum and innominates) are fragmentary. In general, the post-cranial skeleton seems to have been quite normal and healthy; the few existing benign abnormalities and pathologies are described below. A few discrete traits may be noted:

- Clavicles: the conoid tubercle is well-marked on the right and medium on the left; the subclavian groove is medium on both; coranoid facets could not be observed due to breakage;

- Scapulae: the form of the vertebral border is unobservable on both due to breakage; the scapular notch is absent from the right, not observed due to breakage on the left; the glenoid cavity is piriform on both;

- Humeri: the olecranon foramen and supracondylar process are absent from both humeri;

- Sacrum: the 1st sacral vertebra is incompletely fused (at centrum and neural arch) to the lower vertebra;

- Femora: the third trochanter is absent from both femora; there are traces of a hypotrochanteric fossa on both;

- Tibiae: there is no trace of squatting facets on either tibia.

Age, Sex and Stature

Age at the time of death is estimated as 40 to 50 years for the Elk Point individual, on the following bases:

TABLE 2

ELK POINT BURIAL: POST-CRANIAL METRICS AND INDICES

N/A - Not Available due to breakage

Measurement	Right	Left	Authority for Measurement
Clavicles:			
Mid-Shaft Circumference:	39.0 mm	40.0 mm	Bass (1971:103)
Scapulae:			
Glenoid Height:	44.9 mm	44.0 mm	Olivier (1969:221)
Glenoid Breadth:	N/A	32.9 mm	Olivier (1969:221)
Innominates:			
Maximum Breadth:	167.0 mm	N/A	Bass (1971:153)
Ischium Length:	101.0 mm	101.1 mm	Bass (1971:154)
Iliac Height:	126.0 mm	N/A	Olivier (1969:249)
Maximum Width of Sciatic Notch:	63.1 mm	64.5 mm	Olivier (1969:250-251)
Humeri:			
Maximum Length:	343.0 mm	N/A	Bass (1971:114)
Maximum Head Diameter:	51.8 mm	N/A	Bass (1971:115)
Mid-Shaft Diameters:			
(a) Anterior/ Posterior:	16.7 mm	N/A	Bass (1971:115)
(b) Transverse:	23.7 mm	N/A	Bass (1971:114)
Least Circumference:	66.0 mm	67.0 mm	Bass (1971:115)
Radii:			
Maximum Length:	252.0 mm	N/A	Bass (1971:124)
Physiological Length:	237.0 mm	N/A	Olivier (1969:233)
Minimal Circumference:	47.0 mm	44.0 mm	Olivier (1969:233)
Mid-Shaft Diameters:			
(a) Anterior/ Posterior:	13.5 mm	13.5 mm	Olivier (1969:233)
(b) Transverse:	18.7 mm	18.5 mm	Olivier (1969:233)
Ulnae:			
Physiological Length:	244.1 mm	N/A	Bass (1971:130)

TABLE 2 - Continued

Measurement	Right	Left	Authority for Measurement
Ulnae: (Cont.)			
Least Circumference:	41.0 mm	39.0 mm	Bass (1971:130)
Sigmoidal Diameters:			
(a) Anterior/ Posterior:	29.7 mm	N/A	Olivier (1969:237)
(b) Transverse:	20.5 mm	N/A	Olivier (1969:237)
Diaphyseal Diameters:			
(a) Anterior/ Posterior:	13.1 mm	13.1 mm	Olivier (1969:237)
(b) Transverse:	18.1 mm	17.1 mm	Olivier (1969:237)
Femora:			
Maximum Length:	N/A	472.0 mm	Bass (1971:168)
Bicondylar Length:	N/A	470.0 mm	Bass (1971:168)
Trochanteric Length:	443.5 mm	443.5 mm	Brothwell (1963:87)
Maximum Head Diameter:	52.3 mm	52.7 mm	Bass (1971:168)
Subtrochanteric Diameter:			
(a) Anterior/ Posterior:	25.7 mm	26.4 mm	Bass (1971:169)
(b) Transverse:	35.0 mm	35.4 mm	Bass (1971:169)
Mid-Shaft Diameters:			
(a) Anterior/ Posterior:	30.0 mm	30.0 mm	Bass (1971:168)
(b) Transverse:	27.5 mm	27.0 mm	Bass (1971:168)
Mid-Shaft Circumference:	91.0 mm	87.0 mm	Bass (1971:168)
Tibiae:			
Maximum Length:	382.0 mm	N/A	Bass (1971:187)
Maximum Diameter of Proximal End:	81.0 mm	79.0 mm	Swedlund & Wade (1972:20)
Nutrient Foramen Diameters:			
(a) Anterior/ Posterior:	36.4 mm	37.1 mm	Bass (1971:187)
(b) Transverse:	26.7 mm	28.5 mm	Bass (1971:187)
Mid-Shaft Diameters:			
(a) Anterior/ Posterior:	32.2 mm	31.0 mm	Montagu (1960:624)
(b) Transverse:	23.3 mm	23.5 mm	Montagu (1960:624)

TABLE 2 - Continued

Measurement	Right	Left	Authority for Measurement
Tibiae: (Cont.)			
Mid-Shaft Circumference:	90.0 mm	90.0 mm	

N.B.: Traditional measurements not given above could not be made due to breakage (e.g., maximum length for the ulnae, any measures for the fibulae).

Index	Right	Left	Authority for Index
Humeri:			
Robusticity Index:	19.24	N/A	Bass (1971:115)
Diaphyseal Index: (Middle Index)	70.46 Platybrachic	N/A	Olivier (1969:227)
Humerus Head Index:	15.10	N/A	Swedlund & Wade (1972:21)
Radii:			
Robusticity Index # 1:	18.65	N/A	Olivier (1969:233)
Robusticity Index # 2:	19.83	N/A	Olivier (1969:233)
Diaphyseal Index: (Middle Index)	72.19	72.97	Olivier (1969:233)
Ulnae:			
Caliber Index:	16.80	N/A	Bass (1971:131)
Platolineal Index:	69.02 Platolineal	N/A	Olivier (1969:237)
Diaphyseal Index: (Middle Index)	138.17	130.53	Olivier (1969:237)
Femora:			
Platymeric Index:	73.43 Platymeric	74.58 Platymeric	Bass (1971:169-170)
Robusticity Index:	N/A	12.13	Bass (1971:170)
Pilastric Index:	109.09	111.11	Comas (1960:426)
Tibiae:			
Platycnemic Index: (Cnemial Index)	73.35 Eurycnemic	76.82 Eurycnemic	Bass (1971:187)

TABLE 2 - Continued

Index	Right	Left	Authority for Index
Tibiae: (Cont.)			
Diaphyseal Index: (Middle Index)	72.36	75.81	Olivier (1969:271)
Scapulae:			
Glenoid Index:	N/A	74.77	Olivier (1969:221)
Innominates:			
Iliac Breadth Index:	132.54	N/A	Olivier (1969:250)
Multiple Bone Indices:			
Radio-Humeral Index: (Brachial Index)	73.47	N/A	Bass (1971:115)

(a) Full eruption of a complete adult dentition, complete fusion of all epiphyses, and fusion of sphenoid to basiocciput all indicate an adult (23+ years).

(b) An almost complete lack of rarefaction of bone surfaces, and only a small amount of lipping indicate that the individual was not especially old (less than 50 years).

(c) Assessment of age from ectocranial fusion of sutures is not reliable, especially when dealing with an individual from an unknown population; however, endocranial fusion seems a more reliable criterion (see discussion in Krogman 1962:76-88). From the amount of endocranial fusion of sutures on the skull of the Elk Point individual, I feel it is safe to say that he was above 40 years of age.

(d) Dental attrition (tooth wear) is also a somewhat shaky criterion for age assessment. This is particularly so in assessing the Elk Point skeleton's teeth, where tooth wear seems to have been influenced by the presence of a large abscess on the right half of the mandible (see discussion under "Pathologies"). Comparison of molar wear on teeth of the Elk Point skeleton with tables of molar wear for European populations, as given by Brothwell (1963:69) and Miles (1963:204), does suggest an individual of 40+ years of age, which fits in with the other ageing criteria.

The sex of the Elk Point individual is certainly male, so assessed for the following reasons:

(a) The general size and rugosity of the skeleton and its features suggests a male.

(b) The morphology of the orbits (squared, with rounded margins) and the angle of the mandible (below 125^{0}) suggest a male.

(c) The lack of a pre-auricular sulcus suggests a male (other discrete criteria on the pelvis, such as the curvature of the anterior surface of the sacrum, could not be used due to breakage).

(d) Phenice's Criteria: (1) Ventral Arc: lacking (somewhat doubtful due to a slight pathology) = male; (2) Subpubic Concavity: recurve lacking (definite) = male; (3) Medial Aspect: broad area present = male (Phenice 1969).

The "race" of the Elk Point individual is assumed to be American Indian. I have not attempted to assess "race" by discrete skeletal traits, as the traits of local populations are largely unknown as yet, nor have I attempted to use multi-variate statistical approaches (such as are used by Giles and Elliot 1962) because breakage has precluded collection of many of the traditional cranial measurements. My assessment of "race" is based on cultural criteria: the mode of burial and the associated artifact complex (see discussion under "Ethnic Identification").

Given that the "race" of the individual is American Indian, I have utilized the regression formula for Mongoloid males with the smallest standard error as provided in Table 12 of Trotter and Gleser (1958:120). This is the femur-plus-tibia equation:

1.22 (Femur Max.Length + Tibia Max. Length) + 70.37 ± 3.24
= 174.56 ± 3.24 cm (5'8" ± 1¼").

As this equation (and the others provided by Trotter and Gleser) is only a generalized estimation for "Mongoloids", it cannot be expected to be precisely accurate in estimating stature for the local populations on the Northern Plains. I feel that, if anything, the estimated stature for the Elk Point individual is on the low side.

Benign Abnormalities

By "benign abnormality" is meant any abnormal structure or feature of the skeleton and dentition which may be genetic, but which does not appear to have had any detrimental effect upon the individual. I note three benign abnormalities for the Elk Point individual:

(a) Left PM_3: this tooth is now missing, with loss being pre-mortem as is suggested by resorption of the buccal alveolar border. The PM_3 root socket is abnormally short and singular, and the configuration of the adjacent teeth (C_1 and PM_4) suggests that its crown was short and underdeveloped: probably peg-shaped. Its loss resulted in a slight diastema between the left C_1 and left PM_4; cause of loss is unknown.

(b) Right Mandibular Condyle: there is a smooth depression in the centre of its posterior articular surface. This depression exactly fits a slight swelling in the right mandibular fossa. This feature does not seem to adversely effect movement of the mandible.

(c) 13th Ribs: there appear to have been 13th ribs on both right and left sides, as witnessed by the presence of a definite costal facet just below the transverse process on both sides of the 1st lumbar vertebra (see Fig. 3). It is unlikely that these ribs would have any adverse effect.

Pathologies

Cranial Pathologies: Other than those associated with the dentition, only one cranial pathology was noted: the right temporal line on the frontal is marked by nodules of bone and a general roughness. This does not continue onto the right parietal.

Dental and Alveolar Pathologies: The Elk Point individual's greatest health problems were associated with his teeth:

(a) Periodontal Disease (Pyorrhea): evidence of this is seen in the slight to medium resorption of the alveoli on the mandible and maxillae (Brothwell 1963:150).

(b) Dental Calculus (Tartar): Calculus is present on most of the teeth, being particularly heavy on the molars and most especially on the lower molars. Irritation of the gums by these deposits may have contributed towards the periodontal disease noted above.

(c) Dental Caries: Evidence of caries is present on the left PM^4 (slight), left M^1 (large cavity), left M^2 (cavity), right M_2 (two cavities), left M_1 (small cavity), and left M_3 (small cavity). Occurrence of caries seems to be low and concentrated on the left side. It should be noted that deposits of dental calculus can protect the tooth surfaces from caries (Brothwell 1963:153-154), which may explain why there are not more cavities in these teeth.

(d) Chipped Teeth: Most of the chips now on the teeth are very recent (post-excavation). Pre-mortem chips are characteristically small and undistinguished. The exception is a set of facing chips (distal surface of right M_2, mesial surface of right M_3) which may be the result of biting down on some hard object.

(e) Dental Hypoplasia: Slight to medium degrees of "gross hypoplasia" (Brothwell 1963:151-153) can be seen on these teeth: I^1 (right and left),

Figure 3. Costal facet (arrow) on left side, 1st lumbar vertebra.

Figure 4. Mandible from Elk Point Burial showing a large abscess (arrow).

left I^2, left C^1, left PM^3, I_1 (right and left), I_2 (right and left), and C_1 (right and left). The right I^2 is missing and the right C^1 and PM^3 are coated with too much calculus to permit observation of hypoplasia, but the general pattern is clear: the incisors, the canines and the maxillary PM^3's are marked by hypoplasia. Previously it was thought that hypoplasia was caused by fevers and/or Vitamin D deficiency; now it is known that hypoplasia "can be related to a variety of local and systemic disturbances, any of which, depending upon their severity and the degree of tissue response, may result in defective enamel..." (Kreshover 1960: 161). Thus, we cannot specify the cause of the Elk Point individual's hypoplasia, other than to suppose that some "local" or "systemic disturbance" troubled him during his infancy when his permanent teeth were in the process of calcification.

(f) Large Abscess: A large abscess is present on the right half of the mandible (Fig. 4). Some serious infection ate away the bone of the buccal alveolus and corpus, creating a gap stretching from the PM_4 to the M_2 and so deep that a section of the mandibular canal is exposed. So extensively was the bone eaten away that the M_1 had only a single bone contact: only along the lingual aspect of the mesial root. In addition, pressure from the abscess pushed both the M_1 and the PM_4 out of alignment- in a lingual/mesial direction. This resulted in a diastema between the M_1 and M_2.

The abscess was identified as such by Dr. J.M. Plecash, Faculty of Dentistry at the University of Alberta, who also noted that the abscess had healed (its surfaces are covered by a smooth layer of compact bone) and that the M_1 must then have been held in place by a fibrous tissue union.

Such a large abscess must have taken several years to reach its final size and must have been quite painful, a fact which may have affected not only the individual's chewing habits (see below), but may also have affected the course of his life within his society (see under "Personal Identification", below). Since the abscess healed, it cannot be the cause of death. However, we may assume that the abscess was active at some time during his <u>adult</u> life, as it appeared <u>after</u> his full adult dentition was in place.

(g) Tooth Wear: The teeth show heavy wear, with at least some dentine exposed on all teeth. Both M_1's and the left M_2 are so heavily worn that most of the crown enamel has disappeared and the occlusal surfaces, of unprotected dentine, have large basins worn into them. Wear is heaviest on the left mandibular molars (with the exception of the right M_1) as might be expected: during the period when the abscess was active the individual could be expected to concentrate his chewing on the left side. That full use of the right molars was resumed after healing of the abscess is indicated by a second wear-plane (at an angle to the normal occlusal plane) which appears on the right M_1 and right PM_4 - the two teeth which had been shoved out of line by the abscess.

Post-Cranial Pathologies: These pathologies are scattered and most do not seem to be major:

(a) Lipping and rarefaction of centra is present to a small degree on some of the inferior thoracic vertebrae, while some rarefaction but little lipping is present on the lumbars.

(b) There appears to be some bone resorption on the anterior surfaces of the two pubic bones in the immediate vicinity of the pubic symphysis. This may be some form of osteitis.

(c) Small areas of possible osteoporotic pitting are present inside both acetabula at the acetabular notch.

(d) The right clavicle has a deep, linear area of bone resorption on its costal tuberosity. This may have been the site of an active abscess.

(e) There is an oval area of bone resorption on the lateral aspect of the lesser tuberosity of the right humerus - possibly some sort of osteitis.

(f) On the posterior of the lateral condyle of the left femur is a rounded cavity, its surface lined with compact bone. The site of a small tumour?

(g) There may be extra bone growth on the posterior of the left fibula head (this is difficult to evaluate due to breakage).

To help pull together the information on pathologies an outline summary of them is given in Table 3.

TABLE 3

ELK POINT BURIAL: AN OUTLINE SUMMARY OF PATHOLOGIES PRESENT

Extra Bone Growth (Lipping, etc.):

Cranial:

(a) along right temporal line on frontal

Post-Cranial:

(a) lower thoracic vetebrae
(b) lumbar vertebrae
(c) left fibula head

Rarefaction and Osteoporosis:

Post-Cranial:

(a) lower thoracic vertebrae
(b) lumbar vertebrae
(c) right and left acetabula

Bone Resorption (Osteitis, Osteomyelitis, etc.):

Cranial:

(a) periodontal disease of alveoli
(b) abscess on right mandible

Post-Cranial:

(a) osteitis at pubic symphysis
(b) osteomyelitis in right clavicle
(c) osteitis on right humerus (?)
(d) tumour on left femur (?)

Dental Pathologies:

(a) dental hypoplasia
(b) dental caries
(c) dental calculus
(d) heavy tooth wear
(e) chipped teeth
(f) displacement of teeth

Comparisons With Known Populations

As previously noted, local populations on the Northern Plains are almost unknown in terms of comparative osteology. Consequently, comparisons of the Elk Point individual will be limited to the small historic Sharphead population (Mehlenbacher n.d.) - cranial and post-cranial measurements - and to data on Arikara, Pawnee and prehistoric Central Plains populations (Bass 1964) - cranial measurements only.

The Sharphead population derives from the Sharphead Burial Site, a mission graveyard in central Alberta. Apparently all of the burials are individuals from Sharphead's band of Stonies (Assiniboines) and date from the mid-to-late A.D. 1880's. It is likely that many or most of the individuals recovered were victims of epidemics, and all had received a mission (i.e., Christianized) burial (MacDonald 1967).

This population is small; 26 individuals, out of which only a dozen are adults, out of which only six are males (Mehlenbacher n.d.). Added to this is the possibility that this population is exceptionally homogeneous genetically: "from the observable skeletal data this appears to be a highly inbred population.." (MacDonald 1967:19). In actuality, then, this is only a segment of a local population, and a highly non-random segment at that. Consequently, ranges of variation are relatively small and the Elk Point individual, when compared to this population (Table 4), shows a distinctiveness which may be exaggerated by the nature of the Sharphead sample.

In comparing the Elk Point individual with the Sharphead population, the former seems generally more robust in cranial features: with some exceptions, his measurements tend to fall at or above the top of the range for Sharphead males. He most closely approaches the Sharphead population, in terms of cranial measurements, in the sizes of his mandible, palate and nasal region, but the proportions are different: while the Sharphead males tend towards brachyurany (broad palates), he is mesuranic. In the case of post-cranial measurements there is less divergence, although the Elk Point individual definitely tends to match the upper portion of the Sharphead metrical ranges. The most notable feature is the relative flatness of the proximal limb bones in the Elk Point individual as compared to the Sharphead population.

TABLE 4

ELK POINT BURIAL: COMPARISON WITH THE SHARPHEAD POPULATION

Elk Point data are derived from Tables 1 and 2 and represent one individual. Sharphead data are provided by L. Mehlenbacher and represent no more than six individuals.

Symbols indicating relation of Elk Point individual to Sharphead ranges:

(= below the Sharphead range
-- = equal to bottom of Sharphead range
- = equal to lower portion of Sharphead range
± = equal to or near mid-point of Sharphead range
+ = equal to upper portion of Sharphead range
++ = equal to top of Sharphead range
) = above the Sharphead range
)) = much above the Sharphead range

Measurements	Sharphead Ranges and Mean	Elk Point Individual	Comparative Relationship
Cranial Measurements			
Basion-Porion Height:	3.0-21.0 mm m = 11.5	21.7 mm	)
Porion-Prosthion Length:	91.0-109.0 mm m = 99.5	125.5/127.2 mm	))
Bizygomatic Breadth:	133.0-142.0 mm m = 137.5	147.5 mm	)
Bimaxillary Breadth:	96.0-108.0 mm m = 100.8	108.0 mm	++
Nasal Breadth:	23.0-27.0 mm m = 25.2	24.3 mm	-
Orbital Breadth:	37.0-44.0 mm m = 40.2	46.1/46.5 mm	)

TABLE 4 - Continued

Measurements	Sharphead Ranges and Mean	Elk Point Individual	Comparative Relationship
Cranial Measurements - (Cont.)			
Biorbital Breadth:	94.0-104.0 mm $\bar{m}$ = 98.7	107.1 mm	)
Maxillo-Alveolar Length:	48.0-59.0 mm $\bar{m}$ = 53.8	58.1 mm	+
Maxillo-Alveolar Breadth:	61.0-70.0 mm $\bar{m}$ = 65.2	66.3 mm	±
Bicondylar Breadth:	108.0-126.5 mm $\bar{m}$ = 118.0	128.0 mm	)
Bigonial Breadth:	92.0-120.0 mm $\bar{m}$ = 103.8	112.0 mm	+
Height of Ascending Ramus:	55.5-71.5 mm $\bar{m}$ = 61.2	59.0/59.9 mm	-
Minimum Breadth of Ascending Ramus:	35.5-38.5 mm $\bar{m}$ = 36.9	37.5/38.7 mm	++
Height of Mandibular Symphysis:	31.5-37.0 mm $\bar{m}$ = 34.2	31.7 mm	-
Foramen Mentalia Breadth:	43.5-51.0 mm $\bar{m}$ = 47.0	43.5 mm	--
Maximum Mandibular Length:	77.0-86.5 mm $\bar{m}$ = 81.5	110.0 mm	))
Mandible Angle:	116.0^{o}-129.0^{o} $\bar{m}$ = 121.2^{o}	115.5^{o}	(
Occipital Chord:	88.0-105.0 mm $\bar{m}$ = 96.3	100.0 mm	+
Mastoid Length:	21.0-34.0 mm $\bar{m}$ = 27.8	37.5/35.0 mm	)

TABLE 4 - Continued

Measurements	Sharphead Ranges and Means	Elk Point Individual	Comparative Relationships
Post-Cranial Measurements			
Humeri:			
Maximum Length:	28.00-36.50 cm $\bar{m}$ = 31.57	34.30 cm	+
Maximum Head Diameter:	4.00-5.30 cm m = 4.42	5.18 cm	+
A/P Mid-Shaft Diameter:	1.50-2.40 cm m = 1.97	1.67 cm	-
Transverse Mid-Shaft Diameter:	2.0-2.20 cm m = 2.07	2.37 cm	)
Least Circumgerence	5.80 - 7.00 m = 6.22	6.6/6.7 cm	+
Radii:			
Maximum Length:	21.70-28.40 cm m = 24.35	25.2 cm	±
A/P Mid-Shaft Diameter:	1.00-1.50 cm m = 1.12	13.5 cm	+
Transverse Mid-Shaft Diameter:	1.20-1.60 cm m = 1.37	1.87/185 cm	)
Ulnae:			
A/P Diaphyseal Diameter:	1.00-1.50 cm m = 1.15	1.31 cm	+
Transverse Diaphyseal Diameter:	1.10-2.10 cm m = 1.43	1.81/1.71	+
Femora:			
Maximum Length:	40.90-50.90 cm m = 45.28	47.2 cm	+
Bicondylar Length:	40.70-50.10 cm	47.0 cm	+
Subtrochanteric A/P Diameter	2.50-3.40 cm m = 2.97	2.57/2.64 cm	-
Subtrochanteric Transverse Diameter:	2.60-3.50 cm m = 3.03	3.50/3.54 cm	++
A/P Mid-Shaft Diameter:	2.60-3.40 cm m = 2.90	3.00 cm	±
Transverse Mid-Shaft Diameter:	2.30-3.00 cm m = 2.48	2.75/2.70 cm	+

TABLE 4 - Continued

Measurements	Sharphead Ranges and Means	Elk Point Individual	Comparative Relationships
Tibiae:			
Maximum Length:	31.20-40.30 cm m = 35.30	38.20 cm	+
Maximum Diameter Proximal End:	6.90-8.60 cm m = 7.60	8.10/7.90 cm	+
Foraminal A/P Diameter:	3.10-4.20 cm m = 3.50	3.64/3.71 cm	±
Foraminal Trnasverse Diameter:	2.30-3.00 cm m - 2.52	2.67/2.85 cm	+
A/P Mid-Shaft Diameter:	2.50-3.10 cm m = 2.82	3.22/3.10 cm	++
Transverse Mid-Shaft Diamter:	2.00-2.90 cm m = 2.22	2.33/2.35 cm	-
Innominates			
Ischium Length:	7.20-9.40 cm m = 7.94	10.10/10.11 cm	)

The other populations with which comparison is made are proto-historical Arikara, historical Pawnee and a prehistoric Central Plains population (Bass 1964:72). The comparisons (Table 5) are limited in that they deal with the cranium only, and many of the traditional cranial measurements are lacking for the Elk Point individual. Utilizing what is available, it appears that again the Elk Point individual tends to place above or within the upper portion of the ranges of the several populations.

This tendency of the Elk Point individual to place near the top or above the ranges of variation for populations with which he is compared suggests that he derives from a different, and osteologically distinct, population. This osteological assessment is thus compatible with the identification based on cultural grounds (see "Ethnic Identification", below).

ARTIFACT ANALYSIS

As far as can be ascertained, all artifacts associated with the Elk Point Burial were part of or were contained within the birchbark wrapped bundle found beneath the skull. A wide variety of small items were present, including a goodly number of perishables - the preservation of which is attributed to the action of copper salts deriving from the various copper or brass items within the bundle. Table 6 gives a brief listing of the artifacts.

Spatial Relationships of Artifacts

It has been noted previously that when the bundle was opened no record was kept of the placement or arrangement of artifacts within it. This present discussion is an attempt to reconstruct these spatial arrangements and associations insofar as is possible.

According to the testimony of the excavators, Cpl. B.B. Bishop, R.C.M.P., and Dr. K.C. Miller, Coroner, all artifacts were associated with the bundle at the time of excavation. However, it is stated that the bulldozer's blade had ripped open one end of the bundle, exposing some of the artifacts: "birch bark, an old pipe [the steatite pipe bowl], and what appeared to be old bone type spear or arrow heads [the bone awl]" (quoted from R.C.M.P. Occurrence Report, prepared by Cpl. Bishop). To

TABLE 5

ELK POINT BURIAL: COMPARISON WITH ARIKARA, PAWNEE AND CENTRAL PLAINS POPULATIONS

Elk Point Data are derived from Tables 1 and 2 and represent one individual. Other data are derived from Bass (1964:90-91,95) and represent no less than 12 individuals and no more than 57 individuals per population; all are males.

Symbols indicating relation of Elk Point individual to ranges of the several populations are the same as in Table 4, and placed below the means ($\bar{m}$) for the populations. Figures are all in millimeters (mm).

	Elk Point Burial	Arikara Populations			Pawnee Population	Central Plains Population
		Sully(39SL4)	39ST1/39ST216	Mobridge		
Bizygomatic Breadth:	147.50	129-151 $\bar{m}$ = 140.56 +	131-150 $\bar{m}$ = 138.83 +	132-151 $\bar{m}$ = 140.59 +	132-146 $\bar{m}$ = 140.00)	128-150 $\bar{m}$ = 139.00 +
Bigonial Breadth:	112.00	94-117 $\bar{m}$ = 104.46 +	94-108 $\bar{m}$ = 100.27)	91-118 $\bar{m}$ = 104.27 +	92-111 $\bar{m}$ = 102.45)	91-108 $\bar{m}$ = 100.55)
Nasal Breadth:	24.30	24-30 $\bar{m}$ = 26.63 --	23-30 $\bar{m}$ = 26.44 -	23-30 $\bar{m}$ = 26.02 -	22-30 $\bar{m}$ = 25.72 -	23-31 $\bar{m}$ = 26.71 -
Mandibular Length:	110.00	80-102 $\bar{m}$ = 93.35)	85-103 $\bar{m}$ = 92.83)	____	84-105 $\bar{m}$ = 93.09)	81-102 $\bar{m}$ = 92.65)
Basion-Porion Height:	21.7	11-28 $\bar{m}$ = 21.67 ±	16-28 $\bar{m}$ = 20.32 ±	____	19-29 $\bar{m}$ = 21.24 -	13-28 $\bar{m}$ = 19.86 ±
Maxillo-Alveolar Index:	114.11	100.00-133.33 $\bar{m}$ = 117.60 ±	108.33-132.00 $\bar{m}$ - 121.49 -	____ $\bar{m}$ = 121.69 (?)	94.34-130.00 $\bar{m}$ = 118.18 +	108.96-126.42 $\bar{m}$ = 117.22 -

TABLE 6

ELK POINT BURIAL: SUMMARY OF ARTIFACTS

Metal and Glass:

34	Brass (and copper?) tinkling cones
1	Copper/brass awl
2	Copper/brass buttons
1	Iron projectile point
2	Glass beads
	Fragments of a Mirror?

Bone, Stone, Pigments, etc.:

5	Eagle claws
	Fragments of a fisher's skull
1	Sandhill Crane bill
1	Trumpeter Swan ulna tube
1	Lynx fibula awl
1	Steatite pipe bowl
3	Pieces of micaceous granite
	Red ochre (iron oxide)
	Limonite (hydrous iron oxide)
	Commercial vermilion
	Mixtures of these pigments
	Commercial Sulphur

Perishables:

Worsted (wool) ribbon
Canine hair
Various leather cords and fragments
Raven feathers
"Duck" down
Powdered tobacco
Birch bark
Spruce bark
Other bark
Sedge (or grass) remains
Commercial wooden vermilion container
Alder "wand(s)" and fragments
Pointed piece of wood
Miscellaneous pieces of wood

check this I interviewed several persons who had been present at the time the bundle was opened. Most of the artifacts were identified by these persons as being in the bundle; those which were not so identified tended to be the relatively inconspicuous items.

Inspection of the birch bark reveals several large and relatively thick pieces - some folded roughly in half, others flat - which have one side stained and encrusted with earth while the other side (or the interior of the folded pieces) is relatively clean. Traces of fur, feathers and other artifactual materials adhering to the clean surfaces confirm the impression that these pieces of birch bark were wrapped around the mass of artifacts. It must be stressed here that these pieces of birch bark are separate - they do not form a coherent unit (such as a basket or parfleche), but were used as individual pieces to form the wrapping for the bundle. According to one of the persons interviewed, the bundle was flat and compressed prior to opening. This is born out by the general shape and dimensions of the birch bark pieces.

At the time of analysis, some artifacts were still in direct association with each other, and in most cases these associations will be noted during the artifact descriptions. The birch bark pieces used as "wrapping" give evidences on their inner surfaces of direct contact with some of the artifacts: (a) a large folded piece of birch bark has adhering canine hair, raven feathers, "duck" down, hair matted with vermilion and the B15 and B16 pigments (for descriptions of numbered pigments, see "X-ray Fluorescence Tests", below), a green stain from one of the longer tinkling cones, mica particles derived from the micaceous granite, and pigments B13 and B14; and (b) a large flat piece of birch bark with adhering raven feathers and pigment B17.

Particularly in the case of the large folded piece of birch bark, it is apparent that many different artifacts were in close association, as is born out by traces of such contacts on the artifacts themselves (see the artifact descriptions, below). It seems, then, that the artifacts were <u>not</u> individually wrapped, and their original container - such as a "medicine bag" - does not seem to be present. One of the persons interviewed stated that there were concentrations of artifacts within the bundle; this, plus the foregoing evidence, suggests that the large folded

piece of birch bark acted as the primary receptacle of the artifacts which were crammed into it and then other, smaller, pieces of birch bark used to complete the wrapping of the bundle. I say "crammed" because certain artifacts - such as the raven feathers and the wooden vermilion container - suffered breakage which is difficult to attribute to soil pressure.

Artifact Description

Metal and Glass:

(a) Tinkling Cones (total of 34): These are small cones cut out of sheet metal and rolled into shape so that a neat metal seam runs down their lengths. One of the smaller cones (FlOr-1/18) was subjected to X-ray fluorescence tests and its components, in descending order, found to be copper, zinc, iron and lead. This identifies the metal as brass (copper-zinc alloy). However, some of the other cones may be made from sheet copper, as at Fort George (Kidd 1970:170). Metrical analysis readily separates this collection of tinkling cones into distinct groupings according to length, but not according to diameters:

Length Groupings/number	minimum diameters/maximum diameters	
11.5-14.0 mm = 14	2.0-3.0 mm	4.0-4.5 mm
20.0 mm = 1	3.0 mm	4.0 mm
26.5 mm = 1	3.0 mm	6.0 mm
28.5-33.5 mm = 13	2.5-4.0 mm	3.5-7.0 mm
36.5 mm = 1	3.0 mm	6.0 mm
41.5-48.0 mm = 4	3.0-4.0 mm	5.5-7.0 mm

There seem to be three length groupings (short, long, very long) with a few odd sizes in between. Most of the tinkling cones are still strung on lengths of leather cord, and where these cords have not been broken the cones occur in pairs (Fig. 5). An exception is the cluster of seven small cones (FlOr-1/8) shown in Fig. 6. In all cases where pairs or clusters can still be observed, the paired or clustered cones all fall into the same length grouping - suggesting that length was intentionally controlled in both manufacture and stringing of these cones.

Twelve of the cones, including all of the pairs, were associated with

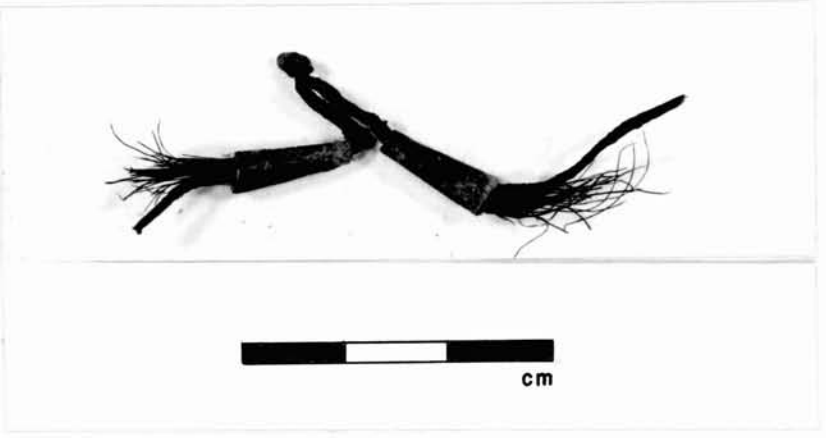


Figure 5. Pair of tinkling cones strung on a leather cord.

Figure 6. Cluster of 7 small tinkling cones.

the canine hair. The cluster of seven was associated with the small leather "wad" (FlOr-1/42) according to one of the persons interviewed. The remaining fifteen cones are now separate and only one of these falls into the lowest length grouping. In addition to a leather cord, most cones also contain a tuft of canine hair.

(b) Copper or Brass Awl (FlOr-1/3): This awl or punch is made from a rod of copper (Fig. 7) with the distal end flattened and pointed by cutting, and with the point bent 24^{o}. This bend may be the result of an attempt to imitate the offset of iron awls (Russell 1967:318, Kidd 1970:119). The proximal end is covered with a bark sheath. The bark could not be specifically identified, but Dr. B.P. Dancik, Department of Forest Science, University of Alberta, states that it is most likely birch or alder (Betula pumila, B. occidentalis, Alnus tenuifolia, or A. crispa) but possibly Prunus pennsylvanica or P. virginiana. These trees and shrubs are widespread in Alberta (Hosie 1969).

(c) Copper or Brass Buttons (total of 2): These are both two-piece, circular, domed buttons with soldered eyes, similar to Olsen's type F (Olsen 1963:553). One (FlOr-1/43) gives these measurements: 16 mm dia., 5 mm max. thickness; eye is 5.5 mm high. This same button has fragments of "duck" down adhering to its reverse and eye, while the other (FlOr-1/51) was found pressed down into the mass of "duck" down.

(d) Iron Projectile Point (FlOr-1/24): This point (Fig. 8) is heavily corroded. Measurements are: 28.5 mm max. length, 18.0 mm max. width at shoulder, 7.0 mm stem length, 7.0 mm stem width, 2.0 mm thickness of body, 3.3 mm thickness of stem. This is almost identical to the triangular stemmed points from Fort George (Kidd 1970:77).

(e) Two Blue Glass Beads (FlOr-1/35): These two beads are identical (Fig. 9) and, indeed, were joined at one time but later cut or broken apart. Measurements are: 8.0 mm dia., 8.0 mm long; hole is 2.5 mm dia. Both beads were subjected to X-ray fluorescence tests (samples B18 and B19) which show them to be chemically identical, with major constituents in the following descending order: arsenic/lead, iron, copper, calcium, manganese and potassium. Strontium is also strongly present. Trace elements include cobalt, nickel, bismuth and yttrium.

Figure 7. Metal awl.

Figure 8. Iron projectile point.

Figure 9. Blue glass beads.

Figure 10. Eagle claws.

(f) Glass Fragments (FlOr-1/33): Four small fragments of glass (two fit together) may be the remains of a small mirror. The glass has a greenish tint but is clear, with one side (slightly convex) coated with a red-brown residue, while the other side (slightly concave) is uncoated. Thickness of the glass is 1.0 mm.

Bone, Stone, Pigments, etc.:

(a) Five Eagle Claws (FlOr-1/19-23): These claws (Fig.10) were identified as eagle through comparison with preserved avian specimens in the Provincial Museum of Alberta. The species can not be stated, but both the golden eagle (Aquila chrysaetos) and the bald eagle (Haliaeetus leucocephalus) are native to Alberta, although the former has the wider distribution (Salt and Salt 1976:90-92). The claws are unmodified and consist of one large and four smaller, and were scattered throughout the bundle according to one of the persons interviewed.

The presence of five claws is curious: an eagle's foot consists of only four digits with four claws - a single posterior digit with a large claw and three anterior digits with a smaller claw apiece; hence, an extra anterior claw is present. I suspect the presence of five claws is culturally significant, but I can find only a partial ethnographic analogy: Denig (1930:567-569 and Plate 72) records a gambling game in which five crow claws were used as counters, one large and four small, painted red on one side and black on the other (in the Cree version, a single unpainted eagle claw is used; see Mandelbaum 1940:236). As the eagle claws from the Elk Point Burial are not painted, there is really no evidence that they were used as gambling counters.

Another set of five eagle claws, but of a different size assortment, is reported from Saskatchewan (Edmunds, Jackson, Spinks and Vigfusson 1938) in probable association with a burial dated to ca. 2,800 B.P. (Kupsch, McCallum and Spinks 1970). Considering the time depth involved, cultural links between this burial and the Elk Point Burial must be considered tenuous.

(b) Fragments of a Fisher's Skull (FlOr-1/36): Fragments of a small mammal's mandible and maxillae, including deciduous and unerupted permanent teeth, were identified as belonging to an immature fisher (Martes pennati)

by Jasper Keizer, Provincial Museum of Alberta. This identification was checked against dental patterns and morphologies of other mustelids in Hall and Kelson (1959) and confirmed. The fisher is native to Alberta. No evidence of cultural modification is present on these remains.

(c) Sandhill Crane Bill (FlOr-1/45 & 46): This bill (Fig.11) was identified as being from a sandhill crane (Grus canadensis) by Jasper Keizer, Provincial Museum of Alberta. It is cut away from the anterior of the skull so that the cut passes down through the mandibular foramina on the lower half of the bill (See Fig. 11 in Olsen 1972:73). On the upper bill, the superior surface at its proximal end is painted with three coloured bands: a dull olive green, a bright red, and a bright emerald green, proceeding distally. The latter two bands are partially obscured by a black gum-like residue.

During their discussion of bird bones in Plains archaeological sites, Ubelaker and Wedel (1975:445-446) describe and illustrate a whooping crane bill and skull recorded as a "medicine" item from an Assiniboine burial. Ochankugahe (Kennedy 1972:153-157) recounts the use of a "white crane" (whooping crane) bill as a counter-charm against a "windigo". Although Ochankugahe is an Assiniboine, he uses several Cree words (Manitou, misatimuk, windigo), which suggests that the story originated with the Cree. As there is no certainty that whooping and sandhill cranes were distinguished as separate birds by either the Assiniboine or the Cree, a sandhill crane bill may have been used in the same manner as that of the whooping crane. The sandhill crane formerly was common throughout Alberta (Salt and Salt 1976:122-123).

(d) Trumpeter Swan Bone Tube (FlOr-1/48): This long (23.9 cm) bone tube has been identified as the left ulna of a trumpeter swan (Olor buccinator) through comparison with skeletal material at the Provincial Museum of Alberta (Fig.12). Both epiphyses had been cut off cleanly and the shaft highly polished. Some small burned spots on the bone appear to underlie the polish. This tube may be a "sucking tube", commonly used by Plains Indians to suck objects from the body of a sick person (e.g., Mandelbaum 1940:254). This bird is native to Alberta (Salt and Salt 1976:27-28).

Figure 11. Bill from Sandhill Crane.

Figure 12. Bone tube made from ulna of Trumpeter Swan.

Figure 13. Awl made from Lynx fibula.

(e) Lynx Fibula Awl (FlOr-1/49): This (Fig.13) was identified as a fibula (probably right) of a lynx (Lynx canadensis) by Jasper Keizer, Provinical Museum of Alberta. The distal end of the bone was sharpened into a point; length is 17.3 cm. The lynx is native to Alberta.

(f) Steatite Pipe Bowl (FlOr-1/29): This pipe bowl (Figs. 14 & 15) was carved out of a dark green steatite (identified by Dr. D.G.W. Smith, Department of Geology, University of Alberta). Measurements are: 26.5 mm exterior diameter at top of bowl, 21.5 mm interior diameter at top of bowl, 12.5 mm interior diameter at bottom of bowl, 32.0 mm maximum exterior diameter of bowl; range in height of bowl is 27.0 to 30.0 mm. The exterior is well polished and decorated with 57 small (2.0 mm dia.) circular pits. A red pigment - matching the commercial vermilion in colour - is present inside some of the pits, but does not appear to have been purposefully applied. I suggest that its presence is indicative of close association between the pipe bowl and the crushed vermilion container within the bundle of artifacts. In addition, a black stain covers a large portion of the bowl's exterior surface. The interior of the bowl is vertically scored, suggesting the marks of cutting tools.

John Nicks (Department of History, University of Alberta) first suggested to me that this bowl had been cut from a platform pipe. This seems to be the case, as a small remnant of the neck is present at the bottom of the bowl. In its material (steatite) and bowl-shape (inverted acorn) this specimen has the characteristics of a "Micmac Pipe", an artifact poorly understood but widely distributed in the Prairie Provinces (see Wallace and Brown 1963, McConnell 1971). While "Micmac" pipes are generally understood to be historical artifacts, only recently has it become clear that they were manufactured by men of the Northwest Company. Both Fort George in Alberta (Kidd 1970:153-156,158) and the Pine Island Post in Saskatchewan (Nicks n.d.) produce fragments of "Micmac" pipes in various stages of manufacture, as well as chunks of the raw materials (steatite, catlinite, claystone, siltstone) showing the marks of files and saws. Furthermore, John Nicks (personal communication) has noted at least one reference in the fur trade journals to the manufacture of stone pipes by Northwest Company personnel. The total time span for the manufacture of "Micmac" pipes has yet to be delineated, but seems to include the occupations of the Pine Island Post (A.D.1786-1794)

Figure 14. Steatite pipe bowl: top and side views.

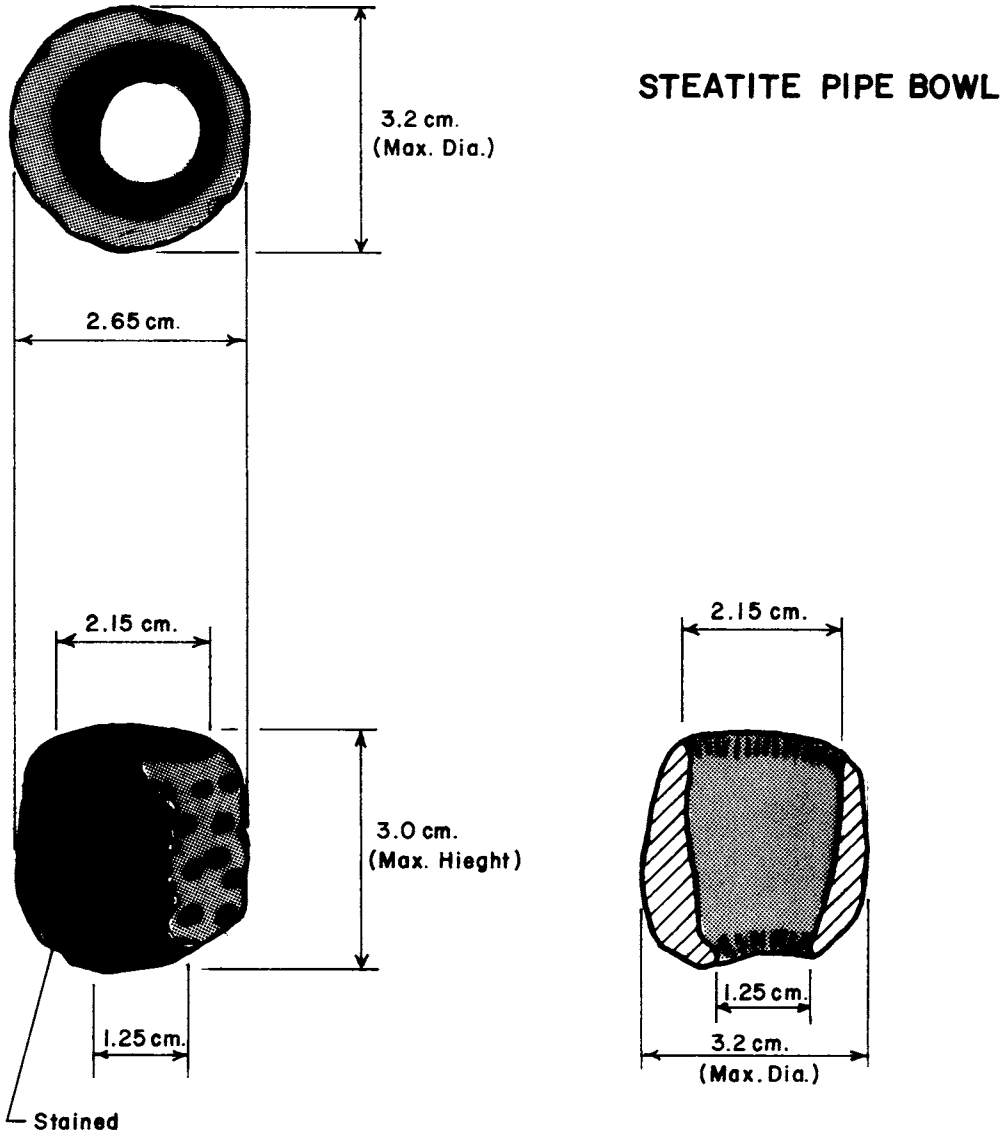


Figure 15. Steatite pipe bowl: top, side and section views.

and Fort George (A.D. 1792-1800).

"Micmac" pipes seem to have been manufactured for trade with the Indians. How popular they were with the Indians is not known at present, but it should be pointed out that they were made from easily broken materials. Indeed, the most fragile portion of the pipe seems to have been the neck, which accounts for the fact that fragments of completed pipes are either bowl-plus-neck or base-plus-neck, with the neck always broken. The present specimen was probably one of the former which was reworked to eliminate the broken neck. It is reasonably certain that the pits on the bowl's exterior were not part of the original decoration, but were added during the reworking. The intended use of the reworked pipe bowl is unknown but I suggest that it might have served as another form of sucking tube.

(g) Micaceous Granite (FlUr-1/55): Three pieces of weathered pink micaceous granite are present and known to have been inside the bundle due to the mica particles adhering to the birch bark wrapping.

(h) Pigments: All pigments are described in detail below, under "X-ray Fluorescence Tests".

(i) Commercial Sulphur (FlOr-1/28): Four lumps of bright yellow sulphur, identification confirmed through the burning of one lump.

Perishables:

(a) Worsted (Wool) Ribbon (FlOr-1/44): This is a short piece of dark reddish brown worsted ribbon, which is wrapped around a tuft of canine hair and tied with unravelled ribbon material.

(b) Canine Hair (FlOr-1/2, 52 & 56): The first catalogue number covers four large masses of matted hair, the other two cover smaller masses and tufts. The hair consists of both short, light brown hairs and longer, dark brown and black coarse hairs; it is identified as "canine" - probably dog - by Jasper Keizer, Provincial Museum of Alberta. At first I assumed that these hair masses were the remnants of a "medicine" bag, however, there is no preserved skin as one might expect despite the close association of tinkling cones with the hair masses (some bird skin was preserved along with the "duck" down!). I have been forced to conclude that only hair was present at the time of placement in the ground.

As noted previously, at least twelve tinkling cones on leather cords were directly in association with the hair masses: some threaded through the hair, others pressed down into it. A good number of the other artifacts, or parts of them, were adhering or matted into the hair masses: raven feathers, threads of worsted ribbon material, pigments (samples B15 and B16), and fragments of the crushed vermilion container. The matting of other materials into the hair masses, plus the "wadded" appearance of the hair supports the interpretation that the artifacts were crammed into the birch bark wrapper.

(c) Leather Cords: All the leather cords are associated with tinkling cones, either as short strips strung with individual cones or as a complete cord strung with a pair of cones and knotted halfway between them. The exception is the cluster of seven tinkling cones (Fig. 6) where the lower portion of a piece of leather was cut into seven or eight individual cords, each strung with a small cone.

(d) Leather "Wad" (F10r-1/42): This is a very small piece of leather, with ragged edges, which was wadded into a ball around a small amount of powdered tobacco. The tobacco is described under "X-ray Fluorescence Tests". One of the persons interviewed states that the "wad" was in association with the cluster of tinkling cones when the bundle was opened.

(e) Raven Feathers (F10r-1/47 & 54): These are fragments of several large black feathers (at least 4 or 5), which have been identified as flight feathers of the common raven (Corvus corax) by Dr. Amadeo M. Rea, Department of Ecology and Evolutionary Biology, University of Arizona. More precisely, these are probably tail feathers, but also might be secondaries from the wings.

The method of identification used by Dr. Rea deserves comment. It involved comparison by microscopic examination of the micro-structure of the unknown feathers with those of known bird species. Observed differences in micro-structure allowed the elimination of species whose feathers appeared to be the same macroscopically, for example the common crow. Detailed descriptions of the technique and its possibilities and limitations are given in Hargrave (1965) and Messenger (1965).

Ubelaker and Wedel (1975:451) recently have stressed the ethno-

graphically-known use of birds as portions of ceremonial paraphernalia, and the importance of archaeological documentation of bird remains. The presence of raven feathers and other bird remains in the Elk Point Burial significantly expands this archaeological documentation. Specific ethnographic analogies for the raven feathers are considered below, under "Personal Identification".

The modern range of the common raven in Alberta coincides with the boreal forest, the foothills and the Rocky Mountains, but expands during the winter into the parklands to the south and east (Salt and Salt 1976: 294-295).

(f) "Duck" Down (FlOr-1/51 & 53): This is a mass of matted white down, with a few small grey feathers and a little dried skin, tentatively identified as "duck" by Jasper Keizer, Provincial Museum of Alberta. This down was matted around one end of a linear bundle of grass or grass-like plant stems and leaves, and appears to be the surviving fragment of a larger mass. This is probably the remnant of a stuffed bird skin. Pressed into the down was a copper/brass button, and another button (FlOr-1/43) also seems to have been associated with the down.

(g) Powdered Tobacco (FlOr-1/42): This tobacco was contained within the small leather "wad" (see above). It is fully described under "X-ray Fluorescence Tests".

(h) Birch Bark Bundle Wrapping (FlOr-1/1): The majority of the birch bark present in the Elk Point Burial had been used in wrapping the other artifacts, and has been described in general terms under "Spatial Relationships of Artifacts", above. The largest piece (ca.13.2 cm long, 22.9 cm wide) is that which had been doubled over at the bottom, with one of the sides curled over, to form a crude receptacle for the other artifacts. As stated before, hair, feathers, pigments and other traces adhere to its interior surfaces. The curled side shows a clean, straight edge suggesting a purposeful cut - such as might be made when beginning to strip bark from a tree. There are two deposits of thick pigment on the interior surface near this cut edge: these have the appearance of spots where small amounts of pigments were mixed - as on an artist's palette - and the X-ray fluorescence tests indicate that these pigments (samples B13 and B14) are indeed mixtures.

A second flat piece of birch bark (7.1 cm long, 25.7 cm wide) also gives evidence of adhering feathers, etc., and probably supplemented the largest piece in the formation of the artifact wrappings. A third piece (5.0 cm long, 18.4 cm wide), folded like the first, may have served to cap the other end of the artifact bundle. It is my impression that these three pieces comprise the inner wrappings of the artifact bundle: if placed together they would form a flat, rectangular package. There are three other large pieces of birch bark (all ca. 22 cm wide; ranging 5 to 15 cm long), all flat, which may have been placed over and under the inner package to form a loose outer wrapping.

In addition to these, there is one large piece of sewn birch bark (Fig.16): originally up to 15 cm long and 18.5 cm wide. Though originally sewn to another piece or pieces (or perhaps to itself to form a cylinder), it appears that the "thread" had been removed and this piece laid flat on top of the artifact bundle at the time of burial. This interpretation is based upon the state of the sewn edges, the lack of other sewn pieces, the differential protection from soil contact of the "lower" side (relatively clean) compared to the "upper" side, and the presence on the "upper" side of a red ochre spot which matches in size and colour the red ochre on the occiput of the skull.

These, and the other birch bark listed below, were identified as white birch (Betula papyrifera) by Dr. B.P. Dancik, Department of Forest Science, University of Alberta. This tree is common in Alberta (Hosie 1969:160-161).

(i) Small Birch Bark Rolls (FlOr-1/1): Although all birch bark was catalogued under the same number, not all of it is bundle wrapping material. Included are two small rolls of paper-thin birch bark (Fig. 17). It is apparent that these strips (29-34 mm wide) were rolled up intentionally, but they are otherwise unmodified. There are also a number of fragments which must come from these rolls, or be the remnants of others. The use for which these rolls were intended is uncertain.

(j) Birch Bark Paint Applicators (FlOr-1/1): These are three stands of single or multiple pieces of thin birch bark which at one end show folded-over tips daubed with pigment (Fig.18). This arrangement suggests them to be paint applicators. The pigments involved are (a) a bright red pigment (vermilion?), (b) a pink pigment identical to

Figure 16. Sewn birch bark.

Figure 17. Roll of thin birch bark.

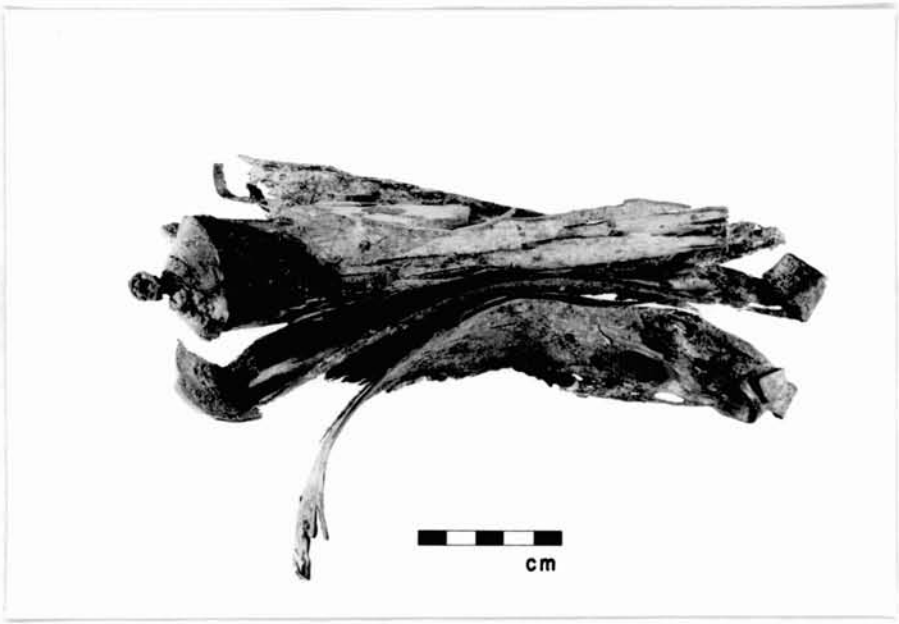


Figure 18. Birch bark paint applicator: paint on folded ends.

X-ray fluorescence sample B3, and (c) an orange-red pigment identical with X-ray fluorescence sample B5.

(k) Spruce Bark (FlOr-1/50): This piece of bark is almost certainly neither an artifact nor originally part of the artifact bundle. I suspect it is simply a recent bark fragment mixed in with the top soil which accompanied the skeleton and artifact bundle. Be this as it may, the bark was identified as white spruce (Picea glauca) by Dr. B.P. Dancik, Department of Forest Science, University of Alberta. Several of these trees grow in the vicinity of the burial site.

(l) Other Bark: see description of the metal awl (above).

(m) Sedge or Grass Remains (FlOr-1/41): These are the bundle of stems and leaves associated with the "duck" down (see above). They cannot be specifically identified, but Dr. John Packer, Department of Botany, University of Alberta, states that the material seems uniform and probably represents a single species of sedge, or - less likely - a grass.

(n) Vermilion Container (FlOr-1/26): This is a small wooden container for commercial vermilion (Fig.19), as indicated by X-ray fluorescence tests (below). It is obviously of European make: carved out of a branch and possibly machine finished, with a screw-on wooden lid. Measurements (from the largest whole piece): 26 mm high, 3.5 mm thick on the side, 5.5 mm thick on the bottom. The interior surfaces of the container and lid are stained bright red by the vermilion. Both had been crushed, apparently at the time of the burial.

John Nicks (Department of History, University of Alberta) was the first person to recognize this item for what it is. He notes that, up until now, historical archaeologists have not known what sort of containers were used in dispensing vermilion to the Indians. The present container provides at least part of the answer.

(o) Alder "Wands" (FlOr-1/27 & 31): These consist of two wooden cylinders and 16 slivers of wood. Some of the slivers can be fitted to the larger of the wooden cylinders, and have been glued back into place (Fig.20), but others cannot be so fitted, nor can a physical connection between the two cylinders be established. One end of each cylinder shows

Figure 19. Wooden vermilion container with lid: side and interior views.

a clean cut - probably made by a metal knife - while the other ends are clearly broken. The reconstructed length of the larger cylinder is about 100 mm; the other (unreconstructed) is 58 mm; while the diameters of the proximal (cut) ends are 14.5 mm and 13.0 mm respectively. Both wooden cylinders are painted red (see X-ray fluorescence sample B8), as are the exterior surfaces of all the wooden splinters. I refer to these as "wands" for lack of a precise use identification; see discussion of their possible function under "Personal Identification".

The wood of the cylinders was identified as either speckled alder (Alnus rugosa) or mountain alder (A. tenuifolia) by Dr. E.G.A. Grimmer, Department of Agricultural Engineering, University of Alberta. Both of these trees have a wide distribution in Alberta (Hosie 1969:172-173).

(p) Pointed Wooden Piece (FlOr-1/41): This is a small wooden cylinder with one end pointed and the other cut off cleanly, as if by a metal knife (Fig.21). Measurements: 41.0 mm long, 7.0 mm diameter at proximal (cut) end. It is coated with faded red paint and was analyzed whole as X-ray fluorescence sample B11 (see below), the results of which suggest its use as a vermilion applicator.

(q) Small Wooden Cylinder (FlOr-1/30): This small piece (18 mm long, 4 to 5 mm diameter) is painted red. Both ends are cut clean - by a metal knife?

(r) Wood Fragment (FlOr-1/34): This is a cylindrical, poorly preserved piece with no indications of modification. Like the spruce bark, I suspect it is not an artifact, but a branch fragment from the top soil.

X-Ray Fluorescence Tests

The analyses described here are energy dispersive X-ray fluorescence tests of various materials from the Elk Point Burial, conducted by Marvin Rawluk on equipment of the Research Council of Alberta. The basic X-ray fluorescence (XRF) technique is described in articles by Nelson (1975) and Haering (1975). These sources concentrate upon its use in obsidian source identification, while its use on Elk Point Burial materials was primarily to identify the constituents of pigments,

Figure 20. Alder "wand": the larger "wand" with slivers glued into place.

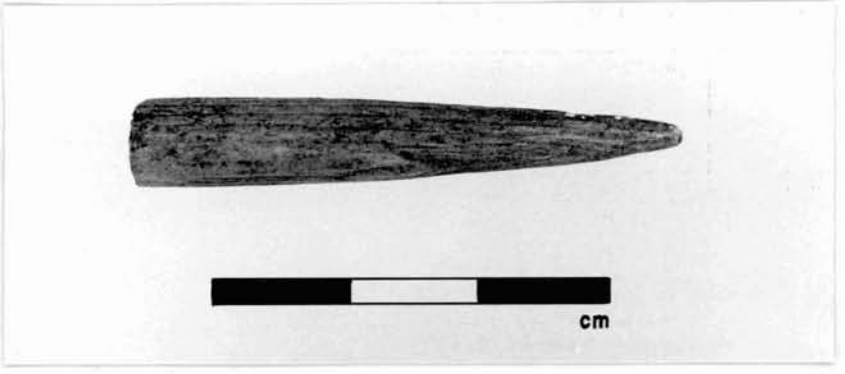


Figure 21. Wooden vermilion applicator.

although other items were also analyzed. The constituents are identified by XRF as atomic elements, not as molecular compounds (Nelson 1975:91); hence, statements on the presence or absence of compounds are interpretations based upon the objective presence/absence of characteristic elements. For instance, resolution of X-ray spectral lines of elements below sodium (Na) on the periodic chart is weak or nil (Nelson 1975:93), thus red ochre (Iron Oxide) will be represented solely by a high iron (Fe) peak since the oxygen (O) is not detectable. Interpretation of compounds is dependent upon relative heights of spectral lines which reflect relative abundance of elements within the sample; absolute abundances are not obtained through XRF analysis. Furthermore, different intensities of X-ray bombardment result in differential resolution of elements high or low in the periodic chart (Nelson 1975:93). The current analysis utilized a medium range intensity for most samples so as to provide a broad information base (i.e., one not biased toward elements high or low on the periodic chart). In some cases, preliminary runs at different intensities provided additional information which was not graphed or stored on tape.

Non-Pigments: Five tests were conducted on non-pigments: a tinkling cone, the two beads (two tests), the triquetral bone from the left hand, and the right M^3 tooth. The results for the tinkling cone and beads have already been reported above.

Left Triquetral/sample B9: The major constituents are calcium (Ca), strontium (Sr) and iron (Fe), as would be expected; minor and trace constituents are (in descending order): lead (Pb), zinc (Zn), copper (Cu), and bromine (Br). Marvin Rawluk points out that the lead content of this bone (and of the tooth) is higher than one would expect for an individual from a pre-industrial (i.e., unpolluted) environment. No explanation for this high lead content is at hand.

Right M^3/sample B10: Calcium, iron and strontium are the major constituents; minor and trace constituents are (in descending order): zinc, lead, and copper. It should be noted that much less strontium and iron (in relation to calcium) are present in the tooth than in the bone reported above.

"Pure" Pigments: These are pigments which do not seem to be mixed with other materials. Included here is the powdered tobacco which, as will be seen, was used as an additive to various of the "mixed" pigments. The XRF spectra of these samples are presented in Fig.22.

Red-stained Fragment of Wooden Container (FlOr-1/26)/sample Bl: This fragment was tested in order to ascertain the nature of the red pigment originally held by the wooden container. Major constituents of pigment and wood are (in descending order): copper (Cu), mercury (Hg) and iron (Fe); minor constituents are calcium and zinc (Fig.22). The high mercury content indicates that the red pigment is a commercial vermilion compound. The high copper and iron peaks probably originate from the wood of the container, rather than from the pigment. Evidence for this can be seen in the spectra for the paint applicator (FlOr-1/41), tested as sample Bll (Fig.22), where high mercury is not accompanied by high copper or iron. Why, then, should the wood of the vermilion container be so high in these two elements while the wood of the applicator is low? I suggest that the container, being of European manufacture, may have been soaked in a copper-salt preservative solution whereas the paint applicator, presumably made of native wood, was not so treated.

Paint Applicator (FlOr-1/41)/sample Bll: Subjection of this artifact to XRF analysis yielded these results (Fig.22): mercury (Hg) and copper (Cu) are the major constituents; iron (Fe) and calcium (Ca) are minor constituents (the peak at the extreme left is probably sodium). The results indicate this piece to be an applicator for the vermilion held in the wooden container.

Yellow Paint Stone (FlOr-1/40)/sample B2: This small yellow, gritty stone has one surface ground smooth. Subjected to XRF analysis (Fig.22), its major constituents are (in descending order): iron (Fe), calcium (Ca) and strontium (Sr); minor and trace constituents are manganese (Mn), titanium (Ti), zinc (Zn), rubidium (Rb) and yttrium (Y). The yellow colour plus XRF results indicate the stone is limonite (hydrous iron oxide), with a calcium carbonate encrustation on its unground surfaces.

Dark Red Pigment (FlOr-1/39)/sample B6: These are fragments of pigment recovered from the artifact bundle. The XRF analysis (Fig.22)

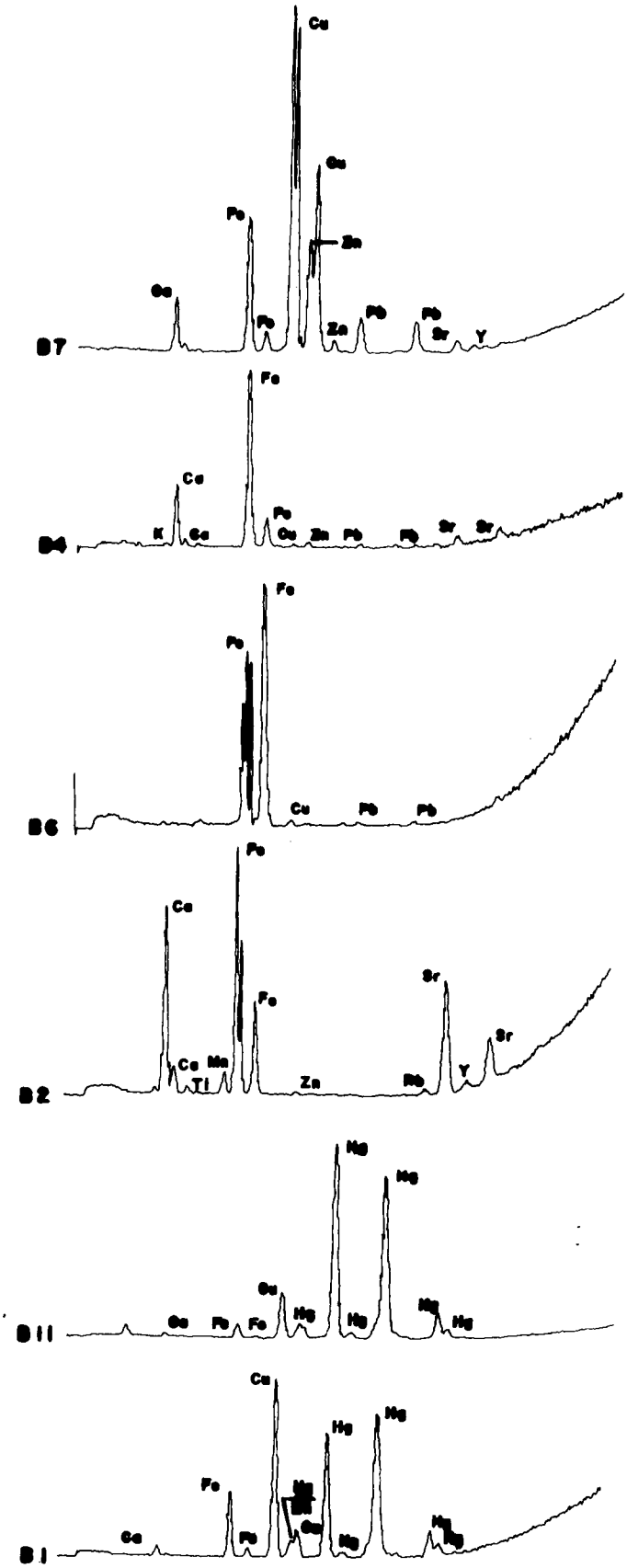


Figure 22. XRF spectra of the "Pure" Pigments.

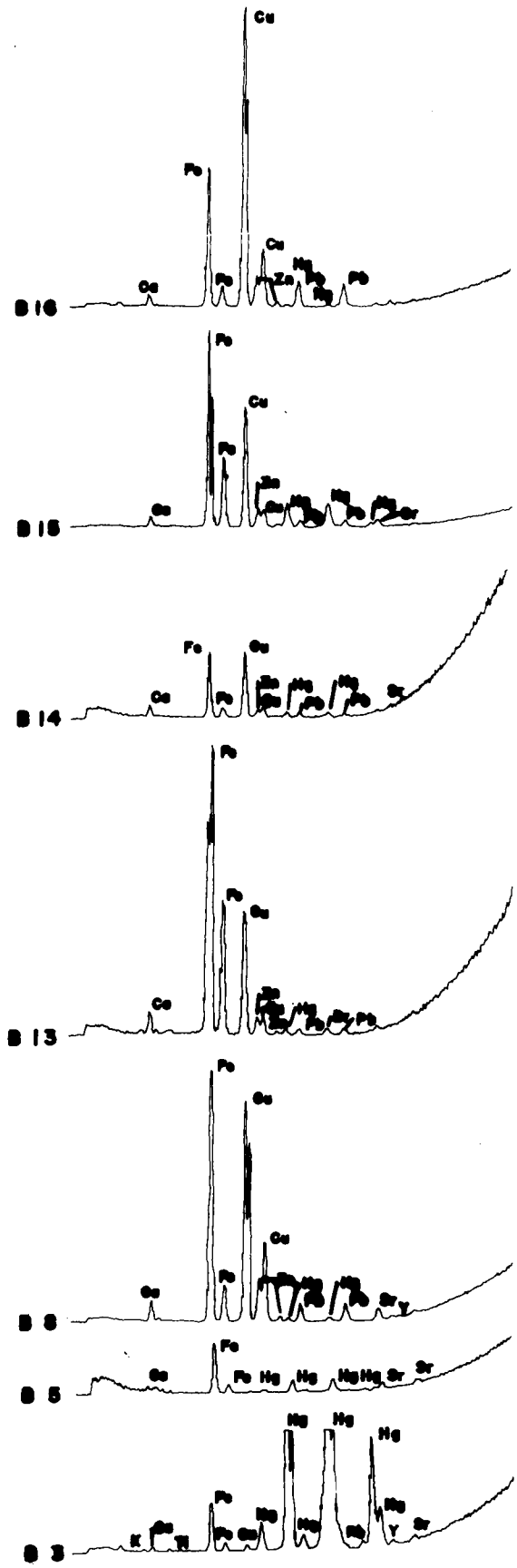


Figure 23. XRF spectra of the "Mixed" Pigments.

shows iron to be the only major constituent, with copper (Cu) and lead (Pb) as trace elements. Without doubt, this pigment is red ochre (iron oxide).

Red Pigment Scraping from Occiput of Skull/sample B4: This was subjected to XRF analysis to check interpretation of the pigment as red ochre. Major constituents (Fig.22) are iron and calcium; minor and trace elements are strontium (Sr), potassium (K), zinc, copper and lead. The small amount of bone included in the scrapping accounts for the calcium, strontium, potassium and zinc, and part of the iron. The majority of the iron must represent the pigment: red ochre.

Powdered Tobacco (F1Or-1/42)/sample B7: This powder, before it was identified as tobacco, was submitted to XRF analysis, with these results (Fig.22): major constituents are (in descending order) copper, iron, zinc, calcium and lead (Pb); minor and trace elements are strontium and yttrium (Y). Since the powder, upon both macro and microscopic inspection, appeared to be organic in nature, and an X-ray powder diffraction test gave no results (indicating that the total metallic content must be very small), a small amount (0.005 gram) of the powder was subjected to quantitative chemical analysis. This latter showed the powder to be ca. 3.5% copper, less than 1.0% zinc, with a trace of lead; the remainder was organic material. (This points up the relative nature of XRF results: major and minor constituents obtained by XRF are only the relative amounts of those elements DETECTABLE by XRF).

At this point, working on his guess that this dark brown powder might be tobacco, Marvin Rawluk had the powder tested by infra-red scanning (IRS), and a comparative IRS test run on tobacco from a modern cigarette. IRS detects organic functional groups. Dr. Thelma Habgood (Doctor of Chemistry employed by the Department of Anthropology, University of Alberta) has inspected the resulting IRS charts and states that the two samples (unknown powder and modern tobacco) compare well with each other, indicating that the powder is indeed tobacco. All of the above analyses were conducted at the Research Council of Alberta.

Marvin Rawluk calls attention to the copper content of the powder, which he considers too high for natural occurrence within tobacco, and

too high to have been added by ground water impregnated with copper salts from the metal ornaments within the artifact bundle. If this tobacco was obtained from European fur traders, then perhaps the copper content is a result of processing, preservation or packing procedures.

Of particular importance are the two equal lead (Pb) peaks on the XRF graph of the powder (Fig. 22). These serve as a "fingerprint" for this powder, and show that, for some reason, amounts of this powdered tobacco were added to several of the mixed pigments described below.

Mixed Pigments: XRF spectra of these pigments are presented in Fig. 23.

Pink Pigment (FlOr-1/38)/sample B3: Fragments of this pigment were recovered from the artifact bundle, and are present on one of the birch bark paint applicators. Major constituents (Fig. 23) are (in descending order): mercury (Hg) and iron (Fe); minor and trace constituents are potassium (K), calcium, titanium (Ti), copper, rubidium (Rb), yttrium (Y) and strontium. However, a preliminary XRF test at a different intensity also showed silicon (Si) to be a major constituent and aluminum (Al) as a minor constituent, plus a trace of chlorine (Cl). Combining this information with the observed colour (pink), I suggest that this pigment is a mixture of vermilion, as indicated by the mercury, and kaolin, as indicated by the silicon and aluminum (Kaolin, or Kaolinite, is hydrous aluminum silicate) and modification of the colour from red to pink.

Red-orange Pigment (FlOr-1/37)/sample B5: Fragments of this pigment were collected from inside the artifact bundle, and it is present on one of the birch bark paint applicators. Major constituents (Fig. 23) are iron and mercury (Hg); minor constituents are strontium and calcium. Combining the XRF spectra with the colour (red-orange), I suggest that the pigment is a mixture of vermilion (the mercury) and limonite (the iron and strontium). In this case, it seems that very little of the calcium carbonate encrustation was ground off, as calcium is low in the composition of the pigment.

Dark Red-painted Cylinder Fragment (FlOr-1/27)/sample B8: This fragment of wood, since being submitted to XRF (Fig. 23), has been used in the reconstruction of one of the cylindrical "wands" (see above), hence

we can be sure it represents the pigment used in painting at least the larger "wand". Major constituents are (in descending order): iron, copper and zinc; minor constituents are calcium, lead (Pb) and strontium, with traces of mercury (Hg) and yttrium (Y). I interpret this as a mixture of red ochre with some of the powdered tobacco (indicated by the high copper and zinc, and the double-peak of lead).

Dark Red Pigment/sample B13: This pigment sample includes a strip of birch bark and derives from the large folded piece of bundle wrapping. Major constituents (Fig.23) are iron and copper; minor constituents are calcium and zinc, with traces of lead, mercury (Hg) and bromine (Br). This seems to be a mixture of red ochre (iron oxide) with a small amount of powdered tobacco (copper, lead, zinc). Thus, it is similar to B8 (above), but with less of the tobacco-additive. From its appearance on the birch bark, the pigment represents a mixing spot.

Yellow Pigments/samples B14 and B17: These two pigments are the same, although B17 (not shown in Fig.23) gives slightly better resolution of the minor and trace constituents. Both samples include birch bark from the bundle wrapping. Major constituents are iron and copper; minor and trace constituents are calcium, zinc, lead, mercury and strontium. This pigment seems to be a mixture of limonite (iron and strontium) and a goodly amount of powdered tobacco (copper, zinc, lead peaks). Again, the visual appearance of the pigment on the birch bark suggests a mixing spot.

Bright Red Pigment Matted into Canine Hair/sample B15: Major constituents (Fig.23) are (in descending order): iron and copper; minor and trace constituents are mercury, zinc, calcium, lead and strontium. This appears to be mainly red ochre and powdered tobacco, with some vermilion.

Dull Red Pigment Matted into Canine Hair/sample B16: Major constituents (Fig.23) are copper and iron; minor constituents are zinc, lead and calcium, with traces of mercury. This seems to be red ochre with a goodly amount of powdered tobacco.

Dating of the Artifacts

Since there is no direct historical documentation of the Elk Point

Burial, an approximation of its temporal position must be made through the artifacts. From the occurrence of European manufactures, it is immediately apparent that the burial must be historical. The artifact assemblage of the Elk Point Burial was inspected by John Nicks (Department of History, University of Alberta), who for some time has been involved in excavation and historical research on the fur trade posts of the North Saskatchewan River. In his opinion, all of the artifacts of European origin - possibly excepting the beads - fit well into the known trading post assemblage of the late eighteenth and early nineteenth centuries (roughly A.D. 1780 to 1830). Furthermore, he notes that should the burial have occurred somewhat later, then one would expect to find some items of later temporal provenience, and such do not occur in the burial.

With this as a reasonable first approximation, there is a period fifty years broad which I should like to narrow down, if possible. To that end, I will review what is known of the dating of specific artifacts.

The copper or brass buttons described above seem to fit Olsen's type F, which he dates on his chart as A.D. 1812-1830 (Olsen 1963: 553). However, in his discussion of this type Olsen notes their manufacture as early as ca. A.D. 1800, with the implication that they were made even earlier (1963:552). It appears, then, that the A.D. 1812 beginning date only marks the beginning of their use by the American military. This gives us a range from ca. A.D. 1800 to 1830, and possibly earlier, for this artifact.

The two glass beads have been inspected by Wayne Davis (Trade Bead Research Centre, B.C. Provincial Museum), who suggests (personal communication) that they were manufactured on the Island of Murano, near Venice, and probably date to ca. A.D. 1750 - 1825. Dr. Roderick Sprague, Department of Sociology and Anthropology, University of Idaho, has also inspected these beads and states: "Based on colour and manufacturing technique [wound] I would assign a tentative date of 1780 - 1810" (personal communication).

The tinkling cones and iron projectile point match those found at Fort George (Kidd 1970:77,84,170 & 185) and Rocky Mountain House

(Noble 1973:104, 148-151). Fort George dates to A.D. 1792-1800 (Kidd 1970: 6-10) and Rocky Mountain House to A.D. 1799-1834 (Noble 1973:154-160).

In the discussion on "Micmac" pipes, I have suggested tentative dates of ca. A.D. 1786-1800 based on their presence at the Pine Island Post and Fort George. I suspect their distribution in time is somewhat broader than this, but at present do not have the data to support an extension in either temporal direction.

Dempsey (1973:35,37-41) presents what seems to be a standard trade goods order form for the Northwest Company during the first decade of the nineteenth century. Perusal of this form indicates which items present in the Elk Point Burial were available from the Northwest Company at that time, to wit: blue beads, buttons, gartering (ribbon?), sulphur, tobacco and vermilion.

The above temporal evidence from European trade goods is not particularly definitive: although it confirms John Nicks' assessment, it does not allow much narrowing of the total time span. I will suggest the first decade of the nineteenth century (ca. A.D. 1800-1810) as a tentative date for the Elk Point Burial, based on known temporal availability of the European materials among the artifacts. However, the preceding and following decades are also reasonable candidates.

IDENTIFICATION

Ethnic Identification: A general identification of the individual from the Elk Point Burial as an "Amerindian" is possible on the basis of the artifact assemblage and the flexed mode of burial. However, a more exact identification is possible through comparison of this burial (a coherent complex of form and spatial arrangement) with the known burial customs of ethnographic groups.

In order to make such a comparison, it was necessary for me to survey the available ethnographic and archaeological literature on burial customs for the Prairie Provinces and some adjacent areas. One point which became clear during this survey is that one should not rely upon a <u>single</u> ethnographic source for an ethnic group when attempting to define that group's burial customs. The problem is that traditional ethnography has gathered <u>normative</u> data, that is: data which records the

cultural ideal of behaviour and practice as perceived through the value systems of the informants. Hence, what one ethnographer presents is usually only a fraction of the total range of variation in actual cultural practice. Contradictions between ethnographies usually represent differential recording of the range of variation, which, when pieced together with the available historical information, begin to yield a fuller picture. However, a complication is added in that historical and archaeological data suggests that there have been changes through time in burial customs for some groups.

Time and space limitations do not allow a full exposition here on Plains Indian burial customs. However, it is apparent that a number of variables interacted differentially to produce the range of variation in individual burials: (a) Status of the individual (sex, age, accomplishments, etc.), (b) Circumstances of death ("natural death", death in war, death by drowning, etc.), (c) Natural context (season of year, geographical location, etc.), (d) Expressed wishes of the deceased, and (e) Expressed wishes of the deceased's relatives.

Turning now to the ethnic identity of the Elk Point Burial the mode of burial suggests that this individual was a Cree man. The ethnographic sources for the Cree give varying accounts of burial customs, however the overlaps are reasonably consistent and produce a general picture of ground burial which fits the Elk Point Burial quite well (Table 7). Since among the Cree ground burial seems to have been the most common and least status-specific form, it itself gives us no personal information on the individual. Table 7 gives "Body Dressed in Best Clothes" as a burial characteristic attested by most sources, but not indicated within the Elk Point Burial; it may be that his best clothes contained no non-perishables, or for some reason he may not have been dressed up before burial.

An important aspect of the Elk Point Burial which is not accounted for is the presence of a fire in the grave after the body had been put in place. If it was an attempt at cremation, it was not very successful, and cremation is not recorded for any of the known groups on the Northern Plains. This latter point, however, may be a matter of lack of early records, since it appears that true cremation with secondary burial of

the bones was practised ca. A.D. 1700 by Cree near York Factory (Tyrrell 1931:231; Kelsey 1929:60) and by at least one band of Woodland Assiniboine (Kelsey 1929:12). What relation these early cremations may have with the Elk Point Burial fire of a century later is impossible to state at this time.

I should note here that Saulteaux (Ojibwa, Chippewa) burial customs are very similar to those of the Cree. Although it is within the range of possibility that the Elk Point Burial may be Saulteaux, I give preference to the Cree interpretation for two reasons: (a) at the time period in question (early A.D. 1800's), there were many Cree in east-central Alberta, but only a few Saulteaux and these as individuals traveling with the Cree or the fur traders, and (b) the lack of certain artifacts (such as birch bark grave lining and trade silver) characteristic of contemporary Saulteaux burials (see discussion in Meyer 1973:25-26).

To wrap up this discussion, mention should be made of other archaeological burials which have been identified as "Cree." Pohorecky (1970: 6-7) illustrates and briefly describes a burial from Saskatchewan called "The Princess", identified as a "25-year-old Cree woman buried around 1860..." (P.6). The basis for this identification is not stated, nor is any citation given. However, such few details as are published by Pohorecky do seem to fit what is known of Cree burial customs. The second source is even less satisfactory: MacNeish (1958:20-21) notes historical Cree burials from the banks of the Red River, Manitoba, but gives few details and no indication of how these were identified as "Cree". At present, I know of no other burials archaeologically defined as "Cree", while, regarding those noted above, the acceptance or rejection of the claimed identifications must await better reportage.

Personal Identification: It is unlikely we shall ever know the name and full life history of the individual from the Elk Point Burial, but certain important aspects <u>do</u> seem within the reach of our knowing: it is my suggestion that this Cree man was a medicine man, or shaman, and further that he may have been a member of the Cree <u>mite·wiwin</u>.

First I shall marshall the evidence that the was a medicine man,

TABLE 7

CREE BURIAL PRACTICES AS RECORDED IN THE ETHNOGRAPHIC AND HISTORICAL LITERATURE

Sources: Bushnell (1927:6-7): based on the historical account by Alexander Mackenzie.
Dusenberry (1962:96-97): based primarily on earlier fieldwork by Peeso.
Peeso (1912:54): based on personal fieldwork.
Skinner (1914:74-76): based on personal fieldwork.
Mandelbaum (1940:247-250): based on personal fieldwork.

General Forms of Burial: (all are primary) X=Present.

	Ground Burial	Scaffold/Tree Burial	Grave House	Tipi Burial
Bushnell:	X	X		
Dusenberry:	X	X		
Peeso:	X			
Skinner:	X			
Mandelbaum:	X	X	X	X

Characteristics of Ground Burial: (with comparions to the Elk Point Burial)

(X = Present, X(?) = May be Present, - = Absent, ? = Presence/Absence uncertain, no symbol = not noted)

Character	Bushnell	Dusenberry	Peeso	Skinnner	Mandelbaum	Elk Point
Grave Structure						
Shallow Grave:		X	X	X		X
Deep Grave:					X	-
Grave Lining:						
Branches:	X	X				X(?) *
Skin/robe				X	X	?
Blankets:				X		?

TABLE 7 - Continued

Character	Bushnell	Dusenberry	Peeso	Skinner	Mandelbaum	Elk Point
Grave Structure (Cont.)						
Pole Grave Cover:				X	X	?
Rocks Over Grave:		X				-
Canopy,Tipi or Grave House Over Grave:	X			X	X	?
Wooden Grave Marker:	X				X	?
Body Postion and Grave Contents						
Body Flexed:			X	X	X	X
Body Placed on Back:			X			X
Body Set Upright:				X	-	-
Head to North:			X		X	X
"Pillow" under Head:					X	X
Personal Possessions in Grave:	X(?)	X	X	X	-	X
Body Dressed in Best Clothes:	X	X	X		X	?
Pipe Placed with Body:		X(?)		X	X	-
Food and/or Tobacco Placed in/on Grave:		X	X	X	X	?
Extra Possessions on Top of Grave:				X		?

* The charcoal in the Elk Point Burial may be the remnants of a grave lining of branches which was consumed by the fire.

consisting of the presence within the artifact bundle (presumably his personal possessions) of certain items which only a medicine man could be expected to possess: the crane bill - a counter-charm against the windigo, the Swan-bone tube - a probable sucking tube, and the decorated pipe bowl - a possible sucking tube. Other items present are ones a medicine man could be expected to possess: the stuffed "duck" skin and the raven feathers (Mandelbaum 1940:209); "Beads, small bells, and cone-shaped tin pendants are now attached to practically all paraphernalia worn or carried on ceremonial occasions" (Mandelbaum 1940:217); the various pigments (Mandelbaum 1940:210); and the micaceous granite rocks (Dusenberry 1962:82). The lumps of sulphur may be added to this list, as Mandelbaum (1940:254) notes that as a result of sucking illness from the body of a patient, "The shaman usually displayed a yellowish, foul-smelling substance as the cause of the trouble", and sulphur would certainly match this description. I should note here that the medicine man, by placing sulphur or some other material in his mouth before sucking out the illness, is not practising a deception - as has often been charged by literal-minded Europeans - but is providing a receptacle for the illness, as otherwise it would pass on into his own body.

The evidence that he was a member of the Cree mite·wiwin is more ambiguous, but I consider the chances are good that this interpretation is correct. One difficulty is that the Cree mite·wiwin is little known, compared to the Ojibwa mide·wiwin, and now may be extinct among the Cree (Mandelbaum 1940:279; Skinner 1914:78). Since this ceremony and society apparently was taught to the Cree by the Saulteaux (Plains Ojibwa) - as claimed by Mandelbaum's informants (1940:279) and suggested in a tale collected by Skinner (1916:361-362) - some recourse will be made to data on the Ojibwa mide·wiwin to clarify details.

Roughly four classes or degrees of medicine men were recognized among both Cree and Ojibwa during the late nineteenth century (Maclean 1896:81-82,178-179: Skinner 1914:77-78; Hoffman 1891:156-159), one of which was the mite·wiwin, itself divided into four degrees (Skinner 1914:77; Hoffman 1891:164). Among the Cree, a person might join the mite·wiwin in order to be cured of an illness (Skinner 1914:78; Mandelbaum 1940:279), which brings us to the first bit of evidence from

the Elk Point Burial: whether or not this man actually was a mite·wiwin member, the large, painful abscess in his lower jaw certainly provided him with the motive for joining!

Initiation into the mite·wiwin involved the sacrifice and eating of a dog provided by the initiate (Mandelbaum 1940:279-280), which may account for the presence of canine hair within the artifact bundle. The pigments in the artifact bundle may relate to facial painting by mite·wiwin members, "the design of which had some relation to their knowledge of medicines" (Skinner 1914:77). Clearly, the mite·wiwin members were curers; "Miteo, the man who uses the bone or shell in [ritual] killing, and the birdskins [my emphasis]. He has an extensive knowledge of roots and herbs, and knows well how to use them in curing disease" (Maclean 1896:81). This last quotation reveals a possible mite·wiwin association for the stuffed "duck" skin and raven feathers, and indicates that the sucking tube(s) may also fit into the picture.

Consideration of the artifacts from the viewpoint of possible mite·wiwin associations also provides a possible interpretation for the red-painted alder "wands": these may be "invitation sticks", used to invite mite·wiwin members to a ceremony. These are not described for the Cree, but Ojibwa examples are described and illustrated by Hoffman (1891: 203-204, Plate XII). According to Hoffman, the invitation sticks are 6 to 7 inches long by 1/4 inch thick, which is both too long and too narrow to match the alder "wands". However, Hoffman's illustration (Plate XII) apparently is life-size since it shows invitation sticks whose proportions - as measured on the plate - exactly match his descriptions; the important thing is that, in addition, a different style of invitation stick is illustrated on the plate, with length of c. 110 mm (4¼ inches) and thickness of ca. 13.0-14.0 mm (3/5 inch) - closely resembling the size of the reconstructed alder "wand". Although the alder "wands" are completely coated with red paint, whereas the invitation sticks described by Hoffman only have a red band at one end, the similarities seem close enough to warrant an equation of the alder "wands" with the second style invitation sticks.

The one item which would clinch the identification of the man buried at Elk Point as a mite·wiwin member is missing: there is no shell, cowrie

or other type. Nor are there evidences of markings on any of the pieces of birch bark. The only explanation which would still allow the mite·wiwin interpretation is to assume that items of this sort were removed from his possession at the time he was buried.

A piece of evidence bearing on this last point (initially discussed under "Spatial Relationships of Artifacts") is that the artifact bundle does not represent the man's personal medicine bundle, where all items would be carefully and individually wrapped (Dusenberry 1962:82), but represents the contents of such a bundle which have been crammed together into the birch bark wrapper. At this point, Skinner (1914:74) provides us with a most interesting statement: "In the old days when a man was a member of the Mite·win, the hair [cut off him at burial] was eventually taken to the grave, the contents of the medicine bag of the deceased was poured over it, and it was buried." The Elk Point Burial seems to present a variant of this procedure: instead of waiting for a period after burial, the emptying of the deceased's medicine bag appears to have occurred at the time of burial, and its contents unwrapped, crammed into the birch bark wrapper, and buried along with their owner. I presume that handling of mite·wiwin sacred objects would likely be done only by another mite·wiwin member, who might remove certain types of objects as a matter of course - such as the shell and any birch bark records possessed by the deceased.

SUMMARY

A historical burial from Elk Point, Alberta, now known as the Elk Point Burial (FlOr-1), consists of one male individual of 40 to 50 years of age at time of death, and about 5'8" (174.5 cm) tall, plus a birch bark-wrapped bundle of artifacts laid in place under his head within the grave. Osteological analysis indicates the man belonged to a different local population than the historical Assiniboine Sharphead population. This is supported by ethnic identification of the man as a Cree, on the basis of known burial customs.

Analyses of artifacts from the bundle include some special techniques, such as feather identification through microstudy and X-ray fluorescence idenification of pigments. The nature of the artifacts indicates

the buried man to be a shaman, a medicine man. Detailed comparisons with the ethnographic literature further suggest that he was a member of the Cree mite·wiwin society.

The life story of this man is only sketchily known: born sometime after ca. A.D. 1750, he suffered some disease, dietary difficiency or other metabolic upset while still in his infancy. Having survived this, he grew to adulthood, but sometime after about the age of 23 he began to suffer from a serious abscess in his right lower jaw. It appears that he was in pain from this abscess for some time - perhaps several years, and this illness may have caused him to seek a cure through joining the mite·wiwin society. His illness cured, he lived for an uncertain number of years afterwards. During at least these latter years he was a visitor to the European fur traders along the North Saskatchewan River (perhaps at Fort George) from whom he acquired many items - some which he used in his curing practices. How he came by his death is uncertain, though he does not seem to have died in war. His temporal existence at an end, sometime between A.D. 1800 and 1810, he was buried according to the customs of his people - at the Place of the Willows.

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