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## Faunal Analysis of the Lane Enclosure, Allamakee County, Iowa

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**SYNOPSIS.** Vertebrates collected from the Lane Enclosure, an Oneota archaeological site, suggest that climatic conditions changed from prairie producing conditions circa 1465 to a more moist, cooler forest situation between 1620 and 1740. A change of this

magnitude would place the Canadian biotic province in northeast Iowa late in the occupation period. The site certainly was occupied in fall and winter, possibly in spring and summer. If the small sample from the five radiocarbon dated storage pits is representative, more fur-bearing animals were trapped after French contact. **INDEX DESCRIPTORS:** Oneota archaeology; vertebrate analysis, post glacial climatic changes.

Two twenty-five by fifty foot test excavations (N1 & N2) at the Lane Enclosure (13AM-200), by Marshall McKusick, State Archaeologist of Iowa, produced a diverse harmonious vertebrate fauna consisting of mammals, turtles, fish, and birds. However, radiocarbon data on five storage pits demonstrated two distinct periods of residence by Oneota people. Charcoal from two storage pits has been dated circa 1465 A.D. Three other samples, associated with a later superimposed fortified settlement, were dated around 1700 A.D. Additional dates may prove continuous occupation.

As most of the vertebrates collected were not associated with dated features, the entire assemblage will be considered initially in order to take advantage of a larger sample. This is intended to give a collective view of climatic conditions, selective hunting practices, and butchering techniques of Oneota people during both periods of residence. Ramification of the separate periods of occupation will be considered later in the report. While the authors do not regard this "lumping" as desirable, it provides a base upon which more subtle interpretations of each occupation period may be derived.

Inspection of Table 1, a faunal list and meat utilization summary (after White, T.E., 1953) indicates that deer, both by weight and number, were the primary source of meat. The wapiti or "elk" and bison, respectively, follow. Beaver, softshell, and fish are significant by number but only contributed 12 percent of the usable meat. The beaver, along with other small mammals probably were collected for meat as well as for fur. This can be substantiated, in part, by the recovery of proportional numbers of all skeletal elements. Scrutiny of Table 2 reveals approximately equal numbers of beaver and muskrat pelvic and pectoral appendicular elements. This suggests that they were returned whole to the locality. Presumably, if collected only for fur value, they would have been roughed out at the kill site and the remains discarded. Larger animals, particularly deer, apparently were butchered at the kill sites with the forequarters returned to camp. Elements from the hind quarters, except the ankle, were scarce. In theory, differences in the number of humeri to femora should not result from differential preservation (White, 1956). While not counted because of their fragmentary nature, cervid vertebrae also were rare. The black bear, represented by at least three individuals, is known only from tarsals and metacarpals. This also suggests selective butchery

or trade for bear paws, perhaps for purses or claws for ornamentation.

Possible climatic conditions at the time of burial can be inferred by examining the climate in the area of sympatry (Fig. 1) for the Lane Enclosure local fauna. Ten of the twelve identified mammals were utilized in sympatry construction. The dog was omitted because of domestication and bison was not considered as range maps of the animal vary considerably. Members of the Lane Enclosure local fauna presently coexist in Canadian biotic province summarized by Cleland (1966, p. 9). This region lies south of the northern shore of Lake Superior and north of the upper half of Michigan's lower peninsula. The Canadian province is composed of an intergradation of plants of the more northern boreal forest and elements of the Carolinian deciduous hardwood forest which lie to the south. Pine and sugar maple are the dominant plant types. This implies a cooler temperate climate than the one in Allamakee County today. If climates can be inferred from an area of sympatry, the site was occupied during a period when the mean annual temperature was 38-40° F., the growing season consisted of 80-140 frost free days, and four to ten feet of snow covered the ground between 100 and 140 days. This can be compared to a mean annual temperature of 46° F. and a growing season of 140-180 days in southern Allamakee County today.

As mentioned previously, radiogenic dates on five storage pits suggest two periods of occupation. Two pits are dated circa 1460 and 1475 AD. Animal remains from a third storage pit (pit 11, N2) are included with the earlier dated pits as it was located under post holes of the stockade. Bones recovered from the 3 later storage pits, dated at 1620, 1690, 1740 AD, were contained within the walls of the fortification. Material identified from these three pits comprise the late sample. While too small to compare statistically, inspection of Table 3, suggests several differences in faunal composition between the two periods. The *bison* is known from the earlier pits and there are relatively few associated browsers such as deer and wapiti. In contrast, black bear, raccoon, beaver, deer, and elk, all of which browse or are forest associated species, have been recorded in varying abundance from the later occupation. They are not known or are less abundant in the earlier pits. The distribution of the beaver (Table 4), in addition to supporting the contention mentioned earlier that the beaver was returned in entirety to camp, illustrates the prevalence of this animal in later deposits. This may reflect an increase of numbers as-

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TABLE I. FAUNAL LIST AND MEAT UTILIZATION TABLE.

COMMON NAME	SCIENTIFIC NAME	MIN. NO. OF INDIVIDUALS	LBS. OF USABLE MEAT/ INDIVIDUALS	LBS OF USABLE MEAT OF SPECIES	% TOTAL OF USABLE MEAT
<b>MAMMALS</b>					
GROUNDHOG	<i>Marmota monax</i>	1	5.6	5.6	.1
MUSKRAT	<i>Ondatra zibethica</i>	3	2.1	6.3	.1
BEAVER	<i>Castor canadensis</i>	18	31.5	567.0	9.3
PORCUPINE	<i>Erethizon dorsatum</i>	1	10.5	10.5	.2
DEER	<i>Odocoileus sp.</i>	18	100.0	1800.0	29.6
ELK	<i>Cervus canadensis</i>	4	350.0	1400.0	23.0
BISON	<i>Bison bison</i>	2	600.0	1200.0	19.7
SKUNK	<i>Mephitis mephitis</i>	1	—	—	—
OTTER	<i>Lutra canadensis</i>	2	12.6	25.2	.4
RACCOON	<i>Procyon lotor</i>	8	17.5	140.0	2.3
DOG	<i>Canis familiaris</i>	8	20.0	160.0	2.6
BLACK BEAR	<i>Ursus americanus</i>	3	210.0	630.0	10.4
<b>FISH</b>					
FRESHWATER DRUM	<i>Aplodinotus grunniens</i>	5	1.0	5.0	} 19.0
WALLEYE	<i>Stizostedion sp.</i>	1	2.0	2.0	
CHANNEL CATFISH	<i>Ictalurus punctatus</i>	4	3.0	12.0	
DOGFISH	<i>Amia calva</i>	4	?	?	}
PICKEREL	<i>Esox americanus</i>	1	?	?	
BLACK BUFFALO FISH	<i>Ictiobus niger</i>	1	?	?	
<b>REPTILES</b>					
MAP TURTLE	<i>Graptomys geographica</i>	2	?	?	} 2.0
SNAPPER	<i>Chelydra serpentina</i>	1	10.0	10.0	
SOFT SHELL	<i>Trionyx sp.</i>	11	10.0	110.0	

sociated with a shift to more forested conditions, an increase in taste for the rodent, or a demand for the fur in relation to development of the French fur trade in the seventeenth century.

Comparison of the fauna from the two periods does suggest a shift in vegetation to a more forested situation during the second or late interval of occupation. This interpretation may be somewhat biased for two reasons. First, bone is twice as abundant in later pits as in the earlier. An increase in species may be affected from a larger assemblage. Second, it appears from Table 2 that the bison is known only from

scapulae, a common trade item. However, the record from pit 3, N2 is based on a terminal phalange which is not generally considered as a trade item. Thus, it reflects the presence of bison in the vicinity.

General climatic interpretations noted by Bryson & Wendland (1967, p. 294) correlate with the climatic shifts indicated by our data. They propose that from 1200-1550 A.D.

TABLE 2. DISTRIBUTION OF MAMMALIAN SKELETAL ELEMENTS.

Species	SKELETAL ELEMENTS																			
	TEETH	CRANIAL	LET. MANDIBLE	LET. MANDIBLE	LET. MANDIBLE	LET. MANDIBLE	LET. MANDIBLE	LET. MANDIBLE	LET. MANDIBLE	LET. MANDIBLE	LET. MANDIBLE	LET. MANDIBLE	LET. MANDIBLE	LET. MANDIBLE	LET. MANDIBLE	LET. MANDIBLE	LET. MANDIBLE	LET. MANDIBLE	LET. MANDIBLE	LET. MANDIBLE
Groundhog	1																			
Muskrat		1	3																	
Beaver	69	2	16	18	5	8	13		15	7	7	1								
Porcupine																				
Deer	34	8	2	10	13	12		4												
Elk	16		3	3	1	3														
Bison																				
Skunk																				
Otter																				
Raccoon	16		4	8		3														
Dog	24		7	5		1														
Black Bear																				

MAMMALIAN BONES - LANE ENCLOSURE

AREA OF SYMPATRY LANE ENCLOSURE

LIMITING SPECIES:  
 — BEAR  
 --- PORCUPINE  
 - - - GROUNDHOG  
 ..... ELK  
 /// SYMPATRY

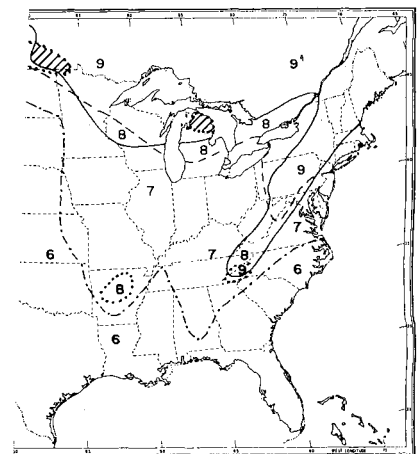


Fig. 1. Area of Sympatry, Lane Enclosure. Hatch marks indicate area where all ten species presently coexist. Numbers correspond to number of coexisting taxa in other regions.

TABLE 3. MAMMALIAN ABUNDANCE BY AGE IN DATED STORAGE PITS.

	GROUNDHOG	MUSKRAT	BEAVER	PORCUPINE	DEER	ELK	BISON	SKUNK	OTTER	RACCOON	DOG	BLACK BEAR
PIT 1A, N1 (1475 A.D.)										1		
PIT 11, N2 (1460 A.D.)			1							2		
PIT 3, N2 (1460 A.D.)			3	2	1	1				1		
PIT 11, N1 (1690 A.D.)			3	1	1					1	1	
PIT 15, N1 (1740 A.D.)			1	1								1
PIT 2, N2 (1620 A.D.)			3	2	1					1		

MAMMALIAN DISTRIBUTION IN THE LANE ENCLOSURE CACHE PITS

TABLE 4. DISTRIBUTION OF BEAVER BY AGE AND SKELETAL ELEMENT.

	TEETH	CRANIAL	MAXILLA	LET MANDIBLE	LET ZYGOMA	LET SCAPULA	LET HUMERUS	LET ULNA	LET RADIUS	LET PIVUS	LET FURUR	LET TIBIA	LET FIBULA	RIGHT MANDIBLE	RIGHT SCAPULA	RIGHT HUMERUS	RIGHT ULNA	RIGHT RADIUS	RIGHT PIVUS	RIGHT FURUR	RIGHT TIBIA	RIGHT FIBULA	R. CALCANEUM	
PIT 1A, N1 (1475 A.D.)																								
PIT 11, N2 (1460 A.D.)																								
PIT 3, N2 (1460 A.D.)	9	3	3	3	2				1			1	1	3	1	1					2	2		
PIT 11, N1 (1690 A.D.)	3	3	3						1						3	3					1	1	2	
PIT 15, N1 (1740 A.D.)	3	1	1						3															
PIT 2, N2 (1620 A.D.)	10	2	1	2					3	2			1	1	1	1	1	1	1	1	2	1	1	1

BEAVER DISTRIBUTION IN LANE ENCLOSURE CACHE PITS

westerlies increased and as a result prairies or grasslands advanced as far east as Indiana. From 1550 to 1880 the circulation pattern was altered so that cooler more moist conditions permitted expansion of the boreal forest south to the great lakes region. The Canadian zone was dispersed south into Iowa.

Seasonal occupation can be inferred from the deer. Observations on the deer demonstrate that the Lane Enclosure was inhabited in fall, winter, and perhaps spring. Of 8 male deer crania recovered, 4 contained well developed antlers, 3 recently had lost their antlers, and one poorly preserved specimen may have been in the process of regeneration.

Deer of practically all age groups were recovered. Using dental characteristics of eruption and wear illustrated by Cockrum (1962, p. 146), 15 mandibles could be assigned to age groups. Three ranged in age from 6 to 12 months, two from 12 to 18 months, one from 18 months to 24 months,

one from 2½ to 4½ years, two from 4½ to 5½ years, two from 5½ to 6½ years, one from 6½ to 7½ years, and three were over 7½ years. The absence of fawns from the site may represent seasonal occupation or that deer were more readily killed in "deer yards" during heavy winter snow. A substantially larger sample is necessary to demonstrate that the site was not occupied in summer.

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