ZOOARCHAEOLOGY OF THE PARSONS SITE

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INTRODUCTION

Although the area excavated during the course of the 1989-1990 investigations represents a relatively small proportion of the estimated site area, it traversed the entire village, crossing the eastern and western palisade lines in approximately the centre of the site. In so doing, it intersected portions of 10 longhouses and four middens. It may, there-fore, be concluded that the recovered faunal assemblage provides a broadly representative sample for at least the core village segment.

As a Gradall was used to remove the over-burden from the site, the faunal material immediately below the plough zone suffered little or no damage. The feature and midden fills were excavated by shovel and screened through 6.0 mm wire mesh. As a consequence, some specimens sustained shovel damage. More-over, excavation by trowelling was restricted to the most depositionally complex areas, thereby hindering the observation of fine scale spatial relationships, such as the articulation of bones. Post-excavation deterioration of the recovered material, however, was minimized by packing faunal elements in paper bags and by isolating the faunal material from heavy containers of lithic and ceramic materials.

The recovered assemblage was cleaned and inventoried at the ASI Toronto office. The inventory data base included fields for bag number, provenience, quantity of elements, an average preservation rating, and a description of the most important features of the faunal elements. This system enhanced the sample selection process by providing a basis upon which to estimate the potential identification rate for material derived from individual features, longhouses, and exterior areas.

The primary sample, which was subjected to intensive analysis, was selected with the objective of evaluating assemblages from specific longhouses and exterior areas. Of particular interest were provenience units that contained considerable quantities of ceramic vessels typically described as St. Lawrence Iroquoian types (House 4, Feature 38; House 8, Feature 193; Exterior Area 8, Feature 149; the East Palisade Area, Feature 240 and the basal level of Midden 4), and those that yielded evidence of European plant species (House 3, Feature 113, and External Area 9, Feature 201). Of these units, only Features 38 and 240 yielded sizeable amounts of analytically useful specimens (49 and 39 items, respectively); Features 113, 149, and 201 each yielded less than 10 analytically useful specimens. Material from the balance of House 4 was also selected for analysis, because of the complex occupational history of that structure (see Robertson, Williamson and Welsh, this volume). The sample also includes material from Houses 3, 7, and 8, which all contained sufficient quantities of faunal material to serve as the basis for comparative analysis. The general locations of the sampled units within the context of the overall settlement patterns may be seen in Robertson, Williamson and Welsh (this volume, Figures 8-10 and 12) and Figure 37.

The sample is derived from 45 provenience units — 33 units from seven longhouse structures and 12 units from six exterior areas. Forty-two of these units yielded identifiable subsistence debris, worked items, or both.

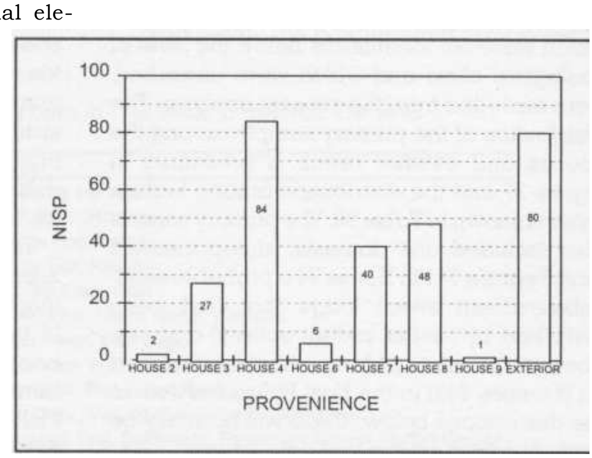

Figure 37. Distribution of the Primary Sample Among the Houses and Combined Exterior Units.

Table 58. Derivation of Primary Sample by Provenience Type.

Provenience Type	House Interior	Exterior	Totals
Ash Pit	12	0	12
Midden 4 (Associated Feature)	0	13	13
Pit	56*	67	123
Refuse-filled Depression -	9	0	9
Semi-subterranean Sweat Lodge	78	0	78
Support Post	5	0	5
Wall Trench	42	0	42
Surface	1	0	1
Other	5**	0	5
TOTAL	208	80	288

Notes concerning European domestic bones:

* Interior total omits one sheep bone from Feature 141 in House 7.

** Exterior total omits one ox bone from Feature 243 in the East Palisade Area 12.

Table 59. Primary Sample*, Distribution of Zoological Classes Among Longhouse Interior and Exterior Living Space.

Zoological Class	Interior Space		Exterior Space		Total	
	n	Percent	n	Percent	n	Percent
Fish	17	9	22	31	39	14
Amphibian (Frog/Toad)	2	1	0	0	2	1
Reptile (Turtle)	18	9	1	1	19	7
Bird	47	24	5	7	52	19
Mammal	114	57	42	**58**	156	57
Class Unknown	2	1	2	3	4	1
TOTAL	200		72		272	

* Excluded from these figures are the two intrusive Euro-Canadian domesticate elements.

Flotation samples accounting for 82 litres of fill were taken from ten features in the primary sample. Three of these contained identifiable faunal remains.

A total of 248 specimens from these units were identified to a useful taxonomic level. An additional 24 items not identified to a useful level were found to be worked. These 272 specimens comprise the primary sample. Approximately 520 additional specimens, which were not identifiable below the level of zoological class and which were unworked, were excluded from the present analysis. The distribution of the primary sample among the houses and exterior areas is presented in Figure 37 and the distribution among feature types is shown in Table 58. The primary sample also included one domestic sheep element from Feature 141 in House 7 (a probable semi-subterranean sweat lodge that had been disturbed by root or rodent activity) and one domestic ox element from a heavily disturbed pit (Feature 243) in the East Palisade Area. In the discussions below, these will normally be excluded from counts and calculations.

In order to be able to report as fully as possible on the worked bone component of the ASI collection, all unanalyzed provenience units were examined for worked faunal elements. This produced a supplementary sample of 89 specimens from 44 additional provenience units including six from interior house contexts, two exterior area features, and 33 midden units. Two worked items were also found during the preliminary test pit assessment of the site, while one specimen was collected during the ploughzone stripping. Twenty-eight specimens in this supplementary sample were identified to a taxonomically useful level. The entire worked bone assemblage, which consists of 156 specimens from both the primary (n=67) and supplementary (n=89) samples, is described in Thomas (Worked Bone and Antler, this volume).

Table 59 presents the distribution of various zoological classes with respect to interior longhouse features and exterior area features. In terms of percentages, identified mammal bone appears to have been distributed evenly between interior and exterior proveniences. Fish bone was more highly concentrated in exterior proveniences, the distribution of bird bone is strongly weighted towards interior proveniences. There was also a strong tendency for the restriction of turtle bone to interior units. Of the zoological classes best represented here, mammal and fish bone represent opposite ends of the durability continuum. One possible reason for the relatively higher frequency of identified fish bone in exterior contexts would be the existence of a systematic difference in the quality of the preservation environment favouring the exterior units in the sample (note that the primary sample did not include material from any midden units). However, bird bone is also generally less resistant to deterioration than mammal bone, yet its distribution seems to be weighted in the opposite direction of fish bone. Therefore, while the distributions shown in Table 59 undoubtedly reflect taphonomic factors to some extent, there would seem to be an element of depositional bias at work as well.

ANALYSIS PROCEDURE

General Considerations

The faunal sample was analyzed at the comparative zooarchaeological laboratory of the Department of Anthropology, University of Toronto. The data recording and entry systems, as well as *dBASE III Plus*® programmes, which generated analytical graphs and reports, were developed by the author (Thomas 1984).

Each specimen identified to an analytically useful level was inspected for butcher marks, either under direct sunlight, or under high intensity, point source, low angle illumination. This method has proven effective in detecting even faint cuts in bone.

Taxonomy used in this report follows Banfield (1981) for mammals, Godfrey (1986) for birds, Mandrak and Crossman (1992) for fish, and Clarke (1981) for fresh water mussels. Anatomical terms generally follow Miller et al. (1964) for mammals and Gilbert et al. (1981) for birds. Specimens identifiable only to zoological class were described according to the relative size categories listed in Table 60.

Differentiation of the domestic dog and timber wolf (Canis *familiaris* and *C. lupus)* was made on the basis of size. To reduce subjectivity, at the slightest ambiguity the taxon assigned was Canis sp. cf. *familiaris.* Specimens that were intermediate between the large dog reference specimen (FA-1019C) and the smallest female wolf were designated Canis sp.

For purposes of this study, "very small mammals," which are more diminutive than the eastern chipmunk (65g), have been excluded from subsistence calculations, although their remains are reported in Table 60. Stahl (1982) has focused attention on the economic potential of certain species which fall into the "very small mammal" and the lower end of the "small mammal" categories, as species that may develop high population densities in culturally disturbed environments and which may be easily trapped. Ethnohistoric data (Thwaites 1896:17:165-7; Wrong 1939:222-223) and archaeological data (e.g., Thomas 1996a:160; 1996b:132-133) demonstrate that certain small and very small mammal species were utilized in the eastern Great Lakes region. However, for the purposes of this study, mammals smaller than the eastern chipmunk are considered to have had relatively little economic significance. In the eastern Great Lakes region the procurement of mouse-sized

Table 60. General Size Categories Used in This Study to Describe Elements Identified to Zoological Class.

Category	Examples
Very Large Mammal	Moose, Cattle, Horse
Large Mammal	Deer, Elk, Bear, Human
Medium Mammal	Wolf, Large Dog, Beaver
Small-Medium Mammal	Small Dog, Fox, Raccoon
Small Mammal	Muskrat, Squirrels, Otter
Very Small Mammal	Chipmunk, Mice, Voles, Moles, Weasels
Very Large Bird	Trumpeter Swan, Bald Eagle
Large Bird	Canada Goose, Wild Turkey, Sandhill Crane
Medium-Large Bird	Common Loon, Red-Tailed Hawk
Medium Bird	Common Crow, Mallard, Canvasback, Goldeneye
Small-Medium Bird	Green-winged Teal, Bufflehead, Passenger Pigeon, Ruffed Grouse
Small Bird	Mourning Dove, Hairy Woodpecker, Robin

and smaller mammals cannot normally be achieved with the same efficiency as the harvest of small fish species with net or fish trap technology. Of course, evidence of systematic exploitation of these species would have prompted a modification to this analytical procedure. Furthermore, carcasses of small burrowing species become mixed with archaeological deposits as individuals die in their burrows from winter-related stresses and other reasons. For example, small predators such as the ermine often take over the burrows of mouse-sized rodents, and stockpile carcasses of mice and voles during the winter (Banfield 1981:321, 326). Therefore, Morelan (1994:135, 139) notwithstanding, some remains of very small burrowing mammals will inevitably represent noncultural "noise" in the archaeological assemblage. Omission of the very small mammal data from the subsistence calculations also makes the ASI mammal data more compatible with faunal data derived from the excavations in the 1950s and 1970s, during which microfaunal remains were less likely to have been recovered.

Entirely excluded from consideration in this study is a concentration of woodchuck bone apparently comprising a major portion of the carcass of a single immature individual. This concentration was recovered primarily from Feature 141 in House 8. It is doubtful that the individual was processed for food, given the lack of cut marks or perimortem fractures, the lack of burn marks, and the unbroken condition of ribs and other delicate structures. Given the dearth of evidence for human alteration, it seems probable that this represents the natural death of an animal in its own burrow rather than a deliberate burial.

Also, several human elements were removed from the primary sample during the preliminary stages of the analysis.

Finally, no attempt was made to analyze terrestrial snail shell fragments because snails may aestivate into archaeological deposits. There is usually no way to differentiate terrestrial snail shell which is contemporary with an archaeological deposit from that which became a natural post-depositional addition.

Quantification *of Data*

Units of quantification used in this study include "number of identified specimens" (NISP) and "minimum number of individuals" (MNI). After aggregation of the primary sample assemblage by archaeological feature, MNI values were calculated using the method described by Bokonyi (1970). As this method takes into account both the size and age-related characteristics of faunal specimens, it tends to produce values which more closely approach the "actual" number of individuals represented in an assemblage than does White's (1953:397) more basic method. Still, given the assumption of post-depositional destruction by taphonomic forces and ploughing, this method probably underestimates by a substantial amount the numbers of animals actually utilized.

The number of identified specimens is the most basic measure of taxonomic abundance because it comprises the first step in reaching MNI and other derivative measures of relative dietary importance. Of the objections to the use of NISP as a basic analytical unit (Grayson 1984:20-24), perhaps the most serious is the assumption of interdependence. This is the justifiable assumption that some of the specimens in a faunal assemblage probably derive from the same carcass. If, for example, a taxon had a NISP value of twenty, all twenty bone fragments could theoretically derive from the same carcass. Although interdependence cannot ordinarily be eliminated, steps can be taken to minimize it. For this reason, the first step in the analysis of a provenience unit is to refit as many broken specimens as possible. Specimens thus joined are allocated a single catalogue number and are counted as a single item. Besides reducing the interdependence factor, the resulting joined specimens are easier to identify and have increased informational value. This step also has the effect of reducing the specimen count below the figures reported in the faunal inventory. Additionally, any bone cluster which apparently represents the deposition of a single carcass is treated separately from the general subsistence debris on the grounds that a faunal interment would have a different depositional pathway than general subsistence debris.

As measures of relative taxonomic abundance, both MNI and NISP suffer drawbacks. Both can be effected by differential preservation. The relationship between the subsistence debris originally deposited on a site and NISP results can be biased by differential deposition patterns, (e.g., the "schlepp effect" described by Perkins and Daly [1968:104]). Generally, MNI results are not distorted in this manner (White 1953:396). On the other hand, MNI results can be seriously influenced by the method of aggregation, while NISP values are not (Grayson 1984:90).

NISP is not just a stepping stone to MNI, but is in itself a valid indicator of relative taxonomic abundance. MNI and NISP figures are actually closely related. "For any given fauna, MNI values can normally be tightly predicted from NISP counts" (Grayson 1984:62, 67). In practice, NISP data is probably used to best advantage in comparative contexts, between parts of a site and between similar sites, bearing in mind the obvious variation in preservation potential between taxa of different sizes and between different zoological classes.

GENERAL OBSERVATIONS

Condition *of the Excavated Material*

Preservation for approximately one-third of the material was considered to be good to excellent while the remainder was considered to fall into the poor to very poor range (Table 61). This is consistent with the fact that approximately one-third of the 810 items in the primary sample were identified to a taxonomically useful level.

In addition, similar rates of preservation were noted for both midden and non-midden contexts; the totals for excellent preservation and for good preservation are very close (Table 61). Given that midden material may be somewhat less fragmented and may have a lower rate of thermal alteration than feature-derived material, the identification rate noted for the analyzed sample suggests that approximately 450 taxonomically useful identifications remain in the unanalyzed assemblage.

Breakdown of the *Sample by Zoological Class*

That mammal bone clearly dominates the faunal assemblage is not surprising given that this material is generally more robust and more readily preserved in comparison to the bone of birds and fish (Table 62). In addition, the primary sample contains little reptile bone and only a trace of amphibian bone, while mollusc shell was only found in the worked bone sub-assemblage. The mollusca are represented by two pieces of modified shell derived from Midden 2. One was tentatively identified as *Elliptio dilatata,* the lady-finger or spike. The second specimen is of medium thickness, in the *Elliptio/Lampsilis* size range.

Fish. A total of 39 fish elements was identified (Table 63). This assemblage is notable for its diversity and lack of focus on any particular species except the bullheads. The 15 bullhead elements, comprising over one-third of the fish assemblage, includes elements identified as brown bullhead, probable brown bullhead,

Table 61. Comparison of Midden and Non-midden Samples With Respect to Degree of Preservation of Faunal Material. Element counts are approximate. Actual figures will vary according to the number of refits, etc.

Provenience	Degree of Preservation					Total
	Excellent	Good	Fair	Poor	Very Poor	
Midden 2	32	197	229	158	20	636
Midden 3	0	0	99	90	0	189
Midden 4	79	16	95	18	0	208
Midden Totals	111	213	423	266	20	1033
Midden Percents	11%	21%	41%	26%	2%	
Non-midden Totals	194	159	447	269	38	1107
Non-midden Percents	18%	14%	40%	24%	3%	
Entire Collection	305	372	870	535	58	2140

Levels of Preservation (after Thomas 1984)
Excellent: Cortex in hard, almost like-new condition.
Good: Cortex fairly hard. Surface attrition, if any, generally does not impair assessment of butcher marks. The main factor limiting taxonomic identification is post-depositional breakage.
Fair: Cortex intact but noticeably weakened, breakage and major root damage may impair observation of butcher marks and taxonomic identification.
Poor. Either: (1) cortex is soft or weak and post-deposition breakage has advanced to the point where taxonomic identification impaired; or (2) breakage, root damage, and/or surface pitting is so extensive that taxonomic analysis is impaired.
Very Poor: Cortex is friable, or, if unburned, has a mud-like consistency). Generally unanalyzable.

Table 62. Analyzed Material by Zoological Class.

Zoological Class	Primary Sample Frequency	%	Worked Bone Sample Frequency	%	Totals Frequency	%
Mollusc (Bivalve)	0	0	2	2	2	1
Fish	39	13	0	0	39	10
Amphibian (Frog/Toad)	2	1	0	0	2	1
Reptile (Turtle)	19	7	0	0	19	**5**
Bird	52	18	36	40	88	23
Mammal*'	158	54	48	54	206	54
Human	17	6	0	0	17	4
Class Unknown	3	1	3	3	6	2
TOTAL	290	100	89	99	379	100
Identified to Taxonomically Useful Level	192	92	78	96		
Not Identified to Taxonomically Useful Level	17	8	3	4		
TOTAL	209		81			

*Among identified mammal elements were one domestic sheep element from an interior feature, and one domestic ox element from an exterior feature.

Table 63. Analyzed Fish Elements. No worked fish elements were found in the primary sample, nor does the worked bone sample include fish elements.

Scientific Name	Common Name	Number of Identified Specimens (NISP), Primary Sample Only
Amia calva	Bowfin	2
Salmo salar	Atlantic Salmon	3
Esox cf. *americanus vermic.*	Pike, Probably Grass Pickerel	3
Esox lucius	Northern Pike	3
Catostomus catostomus	Longnose Sucker	
Catostomus commersoni	White Sucker	
Catostomus sp.	Sucker	
Catostomidae sp.	Sucker Family	
Ameiurus nebulosus	Brown Bullhead	7
Ameiurus sp. cf. *nebulosus*	Bullhead, Probably Brown	
Ameiurus nebulosus/natalis	Brown or Yellow Bullhead	7
Ictalurus cf. punctatus	Channel Catfish	2
Lota *lota*	Burbot	
Ambloplites rupestris	Rock Bass	
Lepomis gibbosus	Pumpkinseed	3
Stizostedion sp.	Walleye or Sauger	
Aplodinotus grunniens	Freshwater Drum	
TOTAL		39
Total Identified to Analytically Useful Level		39

and brown or yellow bullhead. The identification of elements in the "brown or yellow bullhead" category has not been taken to specific level because of morphological similarities between the two species. However, the brown bullhead is far more common and more extensively distributed in the Lake Ontario basin than is the yellow bullhead (Mandrak and Crossman 1992:87-88; Scott and Crossman 1979: 603; Werner 1980:11). For these reasons, and because the yellow bullhead was not positively recognized in the sample, most of the specimens in the "brown or yellow bullhead" category are likely to be brown bullhead.

For purposes of interpreting this particular data set, it is appropriate to treat the brown and yellow bullheads as a single composite taxon. The two species have similar diets, feeding habits, and body size ranges, although the brown bullhead is, on average, slightly larger. They also occupy similar habitats, although the yellow bullhead can cope with more adverse environmental conditions (Scott 1967: 71-72; Scott & Crossman 1979: 597, 602). Because of these similarities, the specific identity of the elements in the "brown or yellow bullhead" category is of little consequence in terms of inferences about procurement techniques, habitat types exploited, or even relative dietary importance.

Amphibians and Reptiles. Two amphibian elements were found, only one of which was identified to species level. Both specimens came from longhouse proveniences. A total of 19 reptile elements was identified, accounting for three species (Table 64).

Avians. Eighty-eight analyzable avian specimens were recovered, 49 of which were identified to an analytically useful taxon (Table 65). The high proportion of worked items in the assemblage (68 percent) is a factor that results in alterations to bone morphology, thereby rendering the task of identification to useful taxonomic level difficult. Fifteen positive, and three probable or possible species were nevertheless recognized.

Table 64. Identified Amphibian and Reptile Elements. No worked amphibian or reptile elements were found.

Scientific Name	Common Name	NISP
Rana catesbeiana	Bullfrog	1
Anura sp.	Frog *or Toad*	1
TOTAL AMPHIBIAN		*2*
Chelydra serpentina	Snapping Turtle	1
Clemmys insculpta	Wood Turtle	1
Chrysemys picta	Painted Turtle	*17*
TOTAL REPTILE		19

Mammals. The 206 analyzed mammal elements include 152 identified to an analytically useful taxonomic level (Table 66). Approximately 23 percent of the total was de rived from the worked bone sub-assemblage. In comparison with the avian bone, a relatively smaller amount of bone in the primary sample was worked (approximately 25 percent). Eighteen species were recognized, including one probable identification and two intrusive European domestic species (ox and sheep).

Table 65. Analyzed Bird Elements.

Scientific Name	Common Name	Number of Identified Specimens		
		Primary Sample	Worked Bone Sample	Total
Gavia immer	*Common Loon*	1	*0*	1
Cygnus columbianus	Tundra *Swan*	*2*	0	*2*
Branta canadensis	Canada *Goose*	*3*	1	4
Branca sp. *cf. canadensis*	*Goose, prob. Canada Goose*	1	*0*	1
Anserini sp.	*Goose species*	*1*	*0*	1
Anas crecca	Green-winged Teal	1	0	*1*
Aythya valisineria	*Canvasback*	1	0	1
Aythya sp. *cf. affinis/marila*	Freshwater Diving Duck, prob. Greater *or* Lesser Scaup	*2*	0	*2*
Melanitta fusca	White-winged Scoter	1	0	1
Accipiter cf. gentilis	Hawk, probably Northern Goshawk	1	0	1
Buteo jamaicensis	Red-tailed Hawk	1	*0*	1
Aves sp. (L) poss H. *leucocephalus*	Probable Bald Eagle	0	*1*	1
Bonasa umbellus	*Ruffed Grouse*	*5*	*0*	*5*
Meleagris gallopavo	Wild Turkey	*6*	1	*7*
Grus canadensis	Sandhill *Crane*	*3*	*2*	*5*
Grus canadensis (poss.)	Possible Sandhill *Crane*	*1*	*0*	1
Ectopistes migratorius	Passenger *Pigeon*	*6*	0	*6*
Aves sp., *cf. E. migratorius*	Probable Passenger Pigeon	1	*0*	*1*
Strix varia	Barred Owl	1	*2*	*3*
Sphyrapicus varius	Yellow-bellied Sapsucker	*2*	0	*2*
Colaptes auratus	*Northern Flicker*	1	*0*	1
Corvus corax	*Raven*	1	*0*	1
Aves sp. (M)		*1*	10	11
Aves sp. (M-L)		*3*	*7*	10
Aves sp. *(L)*		*6*	*12*	18
TOTAL		*52*	*36*	*88*
Total Identified to Analytically Useful Level		42	*7*	*49*

Table 66. Analyzed Mammal Elements.

Scientific Name	Common Name	Number of Identified Specimens		
		Primary Sample	Worked Bone Sample	Total
Sylvilagus floridanus	Eastern Cottontail	2	0	2
Sciurus carolinensis	Grey Squirrel	8	1	9
Tamiasciurus hudsonicus	Red Squirrel	8	0	8
Marmota monax	Woodchuck	4	0	4
Tamias striatus	Eastern Chipmunk	2	0	2
Castor *canadensis*	Beaver	12	0	12
Peromyscus maniculatus	Deer Mouse	1	0	1
Ondatra zibethicus	Muskrat	5	0	5
Canis familiaris	Domestic Dog	30	9	39
Vulpes vulpes	Red Fox	1	3	4
Ursus americanus	Black Bear	9	0	9
Procyon lotor	Raccoon	4	0	4
Martes americana	American Marten	3	0	3
Mantes sp. cf. *americana*	Probable American Marten	1	0	1
Mephitis mephitis	Striped Skunk	6	0	6
Cervidae sp. cf *Cervus* elephas	Large Cervid, Probably Wapiti	1	0	1
Odocoileus virginianus	Virginia White-tail Deer	36	4	40
Cervidae sp. cf O. *virginianus*	Probable W-t Deer (Antler)'	2	0	2
Cervidae sp.	Cervid sp. (Antler)	7	3	10
Mammalia cf. Cervidae	Most Probably Cervid	5	1	6
Mammalia probably Cervidae	Probably Cervid	2	6	8
Bos taurus	Domestic Ox	1	0	1
Ovis aries	Domestic Sheep	1	0	1
Mammalia sp. (M)	Medium-sized Mammal	0	9	9
Mammalia sp. (M-L)	Medium to Large-sized Mammal	4	3	7
Mammalia sp. (L)	Large-sized Mammal	3	9	12
TOTAL		158	48	206
Total Identified to Analytically Useful Level		135	17	152

Antler specimens tentatively identified as white-tail deer on basis of diameter near pedicle

Miscellaneous. The collection also includes six worked items that were not identified to zoological class. Three are from the primary sample and three are from the worked bone sub-assemblage. One of these is probably attributable to a large bird, four are mammal or bird, and the other is mammal or turtle.

Cultural and Taphonomic Alteration

Aside from weathering from soil acids and root etching, the most common type of deterioration was the pre-depositional perimortem (fresh bone) fracturing observed on approximately 28 percent of the mammal, bird and turtle subset of the primary sample. The frequency of fresh bone fractures tends to be high where the extraction of bone marrow fat is an important food processing task. Other forms of alteration, in decreasing order of frequency, included traces of industrial alteration, animal gnawing, thermal alteration, and cut marks resulting from carcass disarticulation (Table 67).

The prominence of worked items, which account for 67 specimens, or approximately 23 percent of the primary sample, indicates the importance of the byproducts of animal carcasses (bone, teeth, and antler) originally acquired for subsistence purposes, in the manufacture of implements and ornaments (Thomas, Worked Bone and Antler, this volume).

Table 67. Attributes of Cultural and Taphonomic Alteration.

Type of Alteration	Frequency	%
Thermally Altered	37	12.8
Fresh Bone Fractured	71	24.5
Butchering Cut Marks	13	4.5
Worked	67	23.1
Rodent or Carnivore Gnawed	50	17.2

Traces of animal gnawing were observed on 17 percent of the sample. Carnivore gnawing was noted on 33 specimens, 18 of which appear to have been gnawed by a dog-sized carnivore, while three appear to have been altered by smaller carnivores. Rodent gnawing was observed on 21 specimens. Four specimens had both carnivore and rodent tooth marks.

Approximately 13 percent of the assemblage was thermally altered. The majority, 30 items, was calcined and seven were at least partly charred.

Butcher marks were noted on a relatively small number of elements: 13 items, which account for five percent of the entire sample. This frequency appears appropriate for a technology based on lithic tools. Lithic tools tend to leave lighter marks on bone than metallic tools, and a butcher mark frequency in the four to five percent range seems to be typical of the mammal, avian, and reptile subsistence bone component of other Iroquoian village sites in southern Ontario prior to the advent of European trade (Thomas 1984, 1992; Carscallen and Thomas 1991; Thomas et al. 1998). None of the cut marks observed in the primary sample appear to be caused by a metal tool. One specimen in the worked bone sub-assemblage bears cut marks that may have been made with a metallic implement (Thomas, Worked Bone and Antler, this volume).

Attributes of alteration were not distributed uniformly with respect to interior and exterior proveniences (Table 68). Frequencies of thermal alteration, fresh bone (perimortem) fracturing, and animal gnawing were all higher for the exterior assemblage, while the interior assemblage had a higher frequency of worked bone.

Some of the distributional trends noted above might be expected. A higher frequency of animal gnawed bone in exterior proveniences is consistent with the expectation that interior living space would be kept relatively cleaner, while waste bone in exterior spaces would lie exposed on the ground surface for a longer time. This would also be consistent with the comparatively higher frequency of fresh bone fracturing observed in exterior proveniences.

It should be noted, however, that the higher frequency of thermal alteration in exterior provenience is not as easily explained. This raises the possibility that the pattern shown in Table 68 may be distorted by various distributional factors. One such factor is the possibility that faunal remains were casually thrown into hearths, to be subsequently cleared out and redeposited in the middens. Another potential factor is the asymmetrical distribution of fish bone (Table 69). Fish bone does not display a fresh bone fracture pattern, and may not survive carnivore chewing or exposure to flame as well as mammal bone. For these reasons, it was necessary to re-examine the distribution of the higher frequency attributes of alteration among a carefully selected subset of faunal elements. Worked bone was excluded from this exercise because it is likely that the curation of such items resulted in different patterns of discard. The re-examination focussed upon mammal bone because, in general, it retains both traces of animal gnawing more clearly, and the diagnostic surfaces of fresh bone fracturing more recognizably, than do elements of other zoological classes. By the same token, very small mammal species were not considered either. Furthermore, only the most reliable areas of the mammal skeleton were examined: appendicular bones, innominates, and mandibles.

Table 68. Material From Inside and Outside of Longhouses Compared With Respect to Cultural and Taphonomic Alteration.

Type of Alteration	House Assemblage		Exterior Assemblage	
	Frequenc		Frequency	
Thermally Altered	*23*	*11*	*14*	*17*
Fresh *Bone Fractured*	*44*	*22*	*27*	*33*
Butchering Cut Marks	10	5	3	4
Worked	*53*	*25*	14	17
Rodent or Carnivore Gnawed	*29*	14	21	*26*

The more refined examination of attributes of alteration, presented in Table 69, provides a clearer picture of how these traits are distributed. Thermal alteration maintains a uniform frequency throughout interior and exterior

Table 69. Unworked Mammal Elements From Inside and Outside of Longhouses Compared With Respect to Cultural and Taphonomic Alteration.

Type of Alteration	House Assemblage		Exterior Assemblage	
	Frequency	%	**Frequency**	%
Thermally Altered	11	22	4	22
Rodent or Carnivore Gnawed	14	27	10	55
Fresh Bone Fractured	10	20	8	44
Total for Type of Provenience	51		18	

This tally is limited to specimens most likely to reliably show traces of animal alteration and, especially, fresh bone fracture: mammal appendicular bones (innominates included) and mandibles. Also excluded are microfauna species, the introduced European domestic ox and sheep, and human.

contexts, which is what one would intuitively expect. In contrast, the frequencies for animal alteration and fresh bone fracturing increase significantly from the interior to the exterior proveniences. These data indicate that animals (dogs) were not allowed to be as active inside as outside, that interior spaces were generally kept clearer of subsistence debris than exterior areas, or, more likely, that a combination of both factors prevailed.

It should be noted, however, that the material from House 3 departs from this basic pattern. The House 3 assemblage has almost four times the rate of animal alteration than is found in all other houses combined and more than is found in the exterior areas. The frequency of carnivore gnawed bone for House 3 approximates that found in exterior areas, but the frequency for rodent-gnawed bone is twice as high (Table 70). As discussed above, the presence of animal gnawed bone suggests that refuse has been left exposed on the ground surface, rather than immediately buried. Thus it may be suggested that the degree of exposure within House 3 was significantly greater than for the other structures, perhaps indicating that some of this material may be related to activities that occurred either prior to or following the occupation of the longhouse. Both pre- and post-House 3 activity is indicated by the settlement pattern data recovered from this portion of the site (see the discussion of House 3 and Exterior Areas 5 and 7 in Robertson, Williamson and Welsh, this volume). Debris that accumulated prior to the occupation of the house eventually may have been incorporated within the fills of interior features. Activity that occurred following the abandonment of the structure may have resulted in the formation of some "interior" features that may not, in fact, be contemporary with the house (for a discussion of the remote possibility that Feature 113 may be related to seventeenth century activity, see Robertson, Monckton and Williamson, this volume).

Three of the House 3 specimens may provide some clues as to the season during which such putative exterior activity may have occurred. Feature 113 yielded a salmon caudal vertebra. Salmon, a lake dwelling fish, would only have been available during the October to November spawning run (Scott and Grossman 1979:194). A main beam section of a white-tailed deer antler was recovered from Feature 112. The distal end of the antler was gnawed by a dog-sized carnivore. The abscission layer (zone of separation between the base of the antler and the skull) is 80 percent complete, leaving part of the frontal bone attached to the antler. In white-tailed deer, the late autumn antler-casting process proceeds very rapidly (Goss 1983:139), so it is reasonable to expect that the state of partial attachment represented by this specimen would persist for less than a day. There can be no question, therefore, as to season of death for this individual. Feature 112 also yielded a rodent gnawed mature muskrat mandible with an in-situ incisor. There are

Table 70. Animal Altered Bone From House 3 and Other Contexts, Primary Sample Only.

Alteration	**House 3** **n=27**	All Other Houses ***n=182***	Exterior Contexts ***n=81***
Rodent Gnawing	22%	4%	9%
Carnivore Gnawing	22%	6%	11%
Rodent or Carnivore Gnawing	4%	10%	17%

transverse grooves on tip of the incisor indicating use of the element as an expedient perforating tool. Because an expedient tool is unlikely to have been curated, this specimen probably reflects utilization of fresh raw material available when the tool was needed. This animal is most likely to have been procured either during the early spring or the fall overland population shift when muskrat are most vulnerable to predation (Banfield 1981:198).

DETAILED COMPARATIVE ANALYSIS: THE ASI AND HAMALAINEN COLLECTIONS

The identifiable, unworked, faunal remains in the ASI primary sample were also compared with those derived from a previous analysis conducted by Peter Hamalainen (1982) on material recovered from the site, as it is unlikely that this subsistence sample has been selectively reduced to the same degree as is apparently the case for the worked bone assemblage (see Thomas, Worked Bone and Antler, this volume). Use of the Hamalainen sample allows for a more complete characterization of the Parsons faunal assemblage in order to study intra-site distribution.

The Hamalainen sample included 3,840 specimens (Hamalainen 1982:G2), of which approximately 1,320 were identified to an analytically useful taxonomic level (excluding European domestic species). In comparison, the ASI collection includes approximately 2,140 elements, and the selected primary sample consists of 281 elements identified to useful level. As such, the Hamalainen report covers slightly more than five times as many useful identifications as the ASI primary sample.

While the Hamalainen sample contains more specimen identifications than the present study, it must be considered with caution because the two data sets are not entirely compatible. The ASI excavation was excavated by a crew of experienced professional archaeologists adhering to a single excavation procedure that included the screening of all feature fill and the floatation of soil samples. Hamalainen's collection is derived from a number of university field school projects, which were undertaken in the 1950s and 1970s (Hamalainen 1982:G2). The recovery methods appear to have varied from year to year, and it is likely that some of the earlier field school excavations failed to recover smaller and less intact specimens. In fact, high identification rates suggested to Hamalainen that certain samples did not represent a 100 percent recovery policy, but that faunal material was selectively collected in the field on the basis of its "identifiability". This was a common practice in the 1950s and early 1960s, but is one which has been found to seriously distort both species and element representation (Payne 1975:7-16). Moreover, some of the worked bone had been removed for study, and had not been returned to the collection (Hamalainen 1982:G2, G22). This would further skew species and element representation in Hamalainen's analyzed collection.

Nevertheless, in comparing the two Parsons faunal data sets, there appear to be no gross discrepancies. While some of the observed differences are probably attributable to sampling error inherent in the relatively small ASI sample size, and to recovery bias and selective post-excavation loss in the Hamalainen sample, many differences appear to be attributable to intra-site variation. These issues are explored below, in a class-by-class comparative analysis of the two samples.

Molluscs

No freshwater mussel species were identified in the ASI primary sample, although unidentifiable flakes of shell were observed. Better preserved, but still unidentifiable fragments were encountered among the worked material in the supplementary sample from midden proveniences. In contrast, 29 identifiable freshwater mussel specimens were noted in the Hamalainen sample (Table 71). It is possible that there is a general tendency for better preservation of freshwater mussel shell

Table 71.The Freshwater Mussel Component of the Hamalainen Collection (Hamalainen 1982:G36).

Scientific Name	Common	NISP	%
Elliptio dilatatus	*Lady-finger*	1	3.4
Elliptio species		24	*82.8*
Lampsilis radiata	*Fat* Mucket	1	3.4
Strophinus	Squaw-foot	*1*	3.4
Lasmigona costata	Fluted Shell	1	3.4
Anodontoides	Cylindrical	1	3.4
TOTAL		*29*	*99.8*

in middens than in features, as a result of relatively higher pH levels of soils in such contexts. Only 13 unidentifiable specimens of the ASI primary sample were derived from a midden context (i.e., the refuse-filled depression [Feature 2451 at the base of Midden 4). Thus the dearth of freshwater mussel shell in the ASI sample may be attributed to differential preservation.

Fish

Prior to Euro-Canadian deforestation, the tributaries of the Humber were more numerous and carried higher volumes of water than they do at present (RSMI 1992:2.1). It is therefore likely that the tributaries of Black Creek, which today consist of standing pools in the summer, might have continued to flow year round, and that some intermittent streams would also have been permanent. Furthermore, the extensive delta marshes situated at the Humber's mouth have also been lost (RSMI 1993:2.1). The Humber marshes, together with the Toronto Island wetland habitat, would have attracted many species of fish to live or to spawn. The extent to which these habitats have been altered subsequent to the occupation of the site renders any type of catchment analysis for fish a difficult exercise.

The ASI and Hamalainen fish assemblages are broadly similar in their salient features (Table 72), although the Hamalainen sample exhibits a more limited range of fish specimens than expected. This may reflect a recovery bias in some of the earlier university field school projects. Despite these discrepancies in the samples, it would appear that, in general, the Parsons fishery was broadly based rather than concentrated on a narrow range of species.

At least a limited degree of exploitation of the waters of Lake Ontario, the adjoining downstream waters of substantial rivers, or both, are suggested by the totals for burbot, sauger/walleye, and freshwater drum. In the ASI sample these taxa comprise eight percent of NISP and 12 percent of MNI, and six percent of NISP in the Hamalainen sample. To this group might be added the white sucker, which is one of the most abundant species in the Humber estuary, the nearby lakeshore area, and in the Toronto Island area (Buchanan

Table 72. Comparison of the Fish Component of the Subsistence Sample of the ASI Collection (Worked Bone Excluded) and the Hamalainen Collection (1982:G35).

Common Name*	Taxon*	ASI Primary Sample				Hamalainen Sample	
		NISP**	% NISP	MNI	% MNI	NISP	% NISP
Lake Sturgeon	*Acipenser fulvescens*	0	0	0	0	3	6.3
Bowfin	*Amia calva*	2	5.2	1	3.8	6	12.7
Atlantic Salmon	*Salmo salar*	3	7.8	2	7.6	0	0
Trout species.	*Salvelinus* sp.	0	0	0	0	3	6.3
Grass Pickerel	*Esox americanus*	3	7.8	1	3.8	0	0
Northern Pike	*Esox lucius*	3	7.8	3	11.5	0	0
Longnose Sucker	Catostomus catostomus		2.6	1	3.8	0	0
White Sucker	Catostomus *commersoni*		2.6	1	3.8	0	0
Sucker sp.	*Catostomus* sp.		2.6	-	-	2	4.2
Brown or Yellow Bullhead***	*Ameiurus*	15	39.5	9	34.6	0	0
Channel Catfish	*Ictalurus punctatus*	2	5.2	1	3.8	9	19.1
Bullhead or Catfish	Ictaluridae sp.	0	0	0	0	15	31.9
American Eel	*Anguilla rostrata*	0	0	0	0	**3**	6.3
Burbot	Lota lota		2.6	1	3.8	0	0
Rock Bass	*Ambloplites rupestris*		2.6	1	3.8	0	0
Pumpkinseed	*Lepomis* gibbosus	3	7.8	3	11.5	0	0
Smallmouth Bass	*Micropterus dolomieu*	0	0	0	0	1	2.1
Largemouth Bass	*Micropterus salmoides*	0	0	0	0	1	2.1
Small- or Largemouth Bass	*Micropterus* sp.	0	0	0	0	1	2.1
Walleye or Sauger	*Stizostedion* sp.		2.6	1	3.8	3	6.3
Freshwater Drum	*Aplodinotus grunniens*		2.6	1	3.8	0	0
TOTAL		38	100	26	100	47	100

For clarity of presentation, probable identifications-such as *Ameiurus* cf. *nebulosus,* or probable brown bullhead-have been merged with positive identifications.
This listing omits item 0628, Catostomidae sp. (the sucker and redhorse sucker family) a taxon which is too broad to be analytically useful.
Due to the morphological and behavioural similarities of the species, elements identified as "brown or yellow bullhead" have been pooled with those identified as "brown bullhead" in the MNI calculations.

1989, RSMI 1992). However, the white sucker would also have been locally available in the Parsons area during its spring spawning run. The pumpkinseed and bluegill, species of lepomid sunfish, are also plentiful in the lower Humber and Toronto Island area (Buchanan 1989; RSMI 1992), but these would also have been locally available on a continuous basis in the site area. The lake whitefish, which figures prominently in the ethnohistory of the Huron (Wrong 1939:185-190), occurred in neither of the samples.

The family Ictaluridae, including the large channel catfish and the smaller bullheads, figures prominently in the two samples, accounting for 44 percent (NISP) or more in both. However the environmental preferences of the channel catfish and bullheads are so different that two separate procurement patterns are indicated. The average length range for the brown bullhead is 203-356 mm, and 203-305 mm for the yellow bullhead (Scott 1967:71-72). This size range would make it difficult to make efficient bone or wood angling tackles of an appropriate scale. The brown and yellow bullheads are nocturnal bottom feeders and prefer shallow, heavily vegetated waters of large, slow moving watercourses, as well as ponds, small lakes and bays (Scott and Crossman 1979:597, 602). These factors would seem to mitigate against the use of drag or cast nets in their procurement. Use of passive equipment, particularly fish traps, would likely have been more effective. The channel catfish is significantly larger, averaging from 356 to 533 mm in length. It feeds in the day and night on the bottom and surface. It prefers cool, clear, deeper waters of lakes and medium to large rivers (Scott and Crossman 1979:604, 608-609). Given its size, feeding habits and preferred habitat, it might have been more effectively procured with angling tackle and with active netting techniques. Given the preferred habitats of the bullheads and the channel catfish, it seems that efforts targeting one ictalurid would be likely to procure significant numbers of the other.

Unlike species such as the Atlantic salmon and the longnose sucker, the spawning behaviour of neither the channel catfish nor the bullheads is characterized by mass migration, population concentration, or by movement into significantly more accessible habitats (Scott and Crossman 1979:589-610) - traits which would render some species more vulnerable to procurement with the fishing technologies utilized by Iroquoian groups.

A substantial number of elements in the ASI sample are attributable to taxa that can tolerate low oxygen levels, high temperatures, or both, including the bowfin, grass pickerel, northern pike, and the bullheads. This group comprises approximately 61 percent of the identified specimens and 53 percent of the MNI total in the ASI sample, but only 13 percent of the identified specimens in the Hamalainen sample. This suggests exploitation of habitats such as the shallow tributary streams of Black Creek, streams which dried to standing pools in the summer, oxbows, sloughs and downstream marshes associated with the Humber, and the marshy inlets bordering Lake Ontario.

Atlantic salmon is noteworthy for its scarcity in the Parsons samples. According to historic records, salmon crowded tributary streams of the Humber in large numbers during the annual spawning run (RSMI 1992:2.1). Despite the large size of the adult salmon, however, its bones are extremely fragile, rendering the species susceptible to negative recovery bias.

The apparent lack of a procurement pattern suggestive of harvest level activity, together with the relatively large number of species taken and the range of habitats exploited, suggest an opportunistic pattern of exploitation. In fact there is no evidence that taxa that were harvested at other sites, such as suckers, salmon, and whitefish, were of economic significance at Parsons. Nor does there appear to have been an emphasis on schooling fish, or large numbers of smaller species, such as sunfish, shiners or perch, which might suggest the importance of net fishing. While the lack of such species in the Hamalainen sample may be attributed to recovery biases, their absence even from the flotation samples of the ASI assemblage, suggests that this pattern is truly reflective of the subsistence practices of the site's occupants.

Amphibians

All amphibian remains identified in either sample (Table 73) are attributable to the order Anura (frogs and toads). The Hamalainen sample contained very few amphibian specimens. Likewise, very few amphibian elements were identified in the ASI sample, despite

Table 73. Comparison of the Amphibian Component of the Subsistence Sample of the ASI Collection (Worked Bone Excluded) and the Hamalainen Collection (1982:G31).

Common Name*	Taxon*		ASI Primary Sample				Hamalainen Sample	
			NISP**	% NISP	MNI	% MNI	NISP	% NISP
Bullfrog	*Rana* catesbeiana		1	-	1	-	0	
Frog species	*Rana* sp.		0	0	0	0	1	
Toad species	*Bufo* sp.	-	0	0	0	0	2	
Frog or Toad species	Anura sp.		1	-	-	-	1	
TOTAL			2	0		0	4	0

Table 74. Comparison of the Reptile Component of the Subsistence Sample of the ASI Collection (Worked Bone Excluded) and the Hamalainen Collection (1982:G34).

Common Name*	Taxon*	ASI Primary Sample				Hamalainen Sample	
		NISP**	% NISP	MNI	% MNI	NISP	% NISP
Snapping Turtle	*Chelydra serpentina*	1	5.2	1	11.1	8	5.7
Wood Turtle	*Clemmys insculpta*	1	5.2	2	22.2	9	6.4
Blandings Turtle	*Emydoidea blandingi*	0	0	0	0	43	30.9
Painted Turtle	*Chrysemys picta*	*17*	89.4	6	66.6	79	56.8
TOTAL		19	100	9	100	139	100

careful screening of feature and midden fill, and the processing of soil samples. Those elements that were recovered must be considered with caution since toads can naturally incorporate themselves into archaeological deposits by aestivation.

Reptiles

The reptile components of the ASI and Hamalainen samples are similar in that only turtles are present, but they are nevertheless weakly represented in comparison to the rest of the assemblage. Likewise, painted turtle is the most strongly represented species in both samples, while the snapping turtle and wood turtle are rare (Table 74). The samples differ in that Blanding's turtle has the second highest element frequency in the Hamalainen sample, yet is totally absent from the ASI sample.

This difference between the two samples is more probably due to intra-site distribution than to any problem with differential recovery, because the large, robust bones of the Blanding's turtle cannot be missed by excavators screening feature fill. Turtle remains occasionally have a patchy distribution because entire turtle shells can be used for rattles and bowls. Indeed, it appears that 13 of Hamalainen's painted turtle shell fragments from unit P55 R54 are attributable to a single worked object, presumably a shell rattle (Hamalainen 1982:G24). Nearly 60 percent of the painted turtle elements in the ASI sample came from a single unit-Feature 141 in House 7. Not all of the elements fit together, but there is no definite duplication and all came from a relatively large individual. None of the ASI material, however, bore traces of industrial alteration.

Of all the turtles in either sample, the snapping turtle has the strongest preference for soft-bottomed habitat. Given the evidence of opportunistic fishing discussed above, and given the presence of several species which prefer habitat with a soft or muddy bottom (grass pickerel, brown bullhead, pumpkinseed, bluegill, American eel and largemouth bass), it is surprising to find so little evidence for snapping turtle exploitation.

Avians

The avian components of the ASI and Hamalainen samples are similar in that they both encompass a relatively large number of species, 18 and 19, respectively (Table 75). In total numbers, the Hamalainen sample exceeds the ASI sample by a factor of approximately 1:3.6. However, considering that the difference between the mammal assemblages (Table 76) is more than 1:6, the Hamalainen avian sample seems to be smaller than expected. This may reflect improvements to recovery methods in more recent decades.

The most salient feature of the Hamalainen sample is the high frequency of passenger pigeon bones. These account for over half the

Table 75. Comparison of the Avian Components of the ASI Collection (Worked Bone Excluded) and the Hamalainen Collection (1982:G33).

Common Name*	Taxon*	ASI Primary Sample				Hamalainen Sample	
		NISP	% NISP	MNI	%	NISP	% NISP
Common Loon	*Gavia immer*	1	3.5	1	4.7	2	1.9
Loon species.	Gavia sp.	0	0	0	0	1	0.9
Tundra Swan	*Cygnus columbianus*	1	3.5	1	4.7	1	0.9
Canada Goose	*Branta canadensis*	**3**	10.7	2	9.5	7	6.9
Goose sp.	Anserini sp.	0	0	0	0	6	5.9
Black Duck	Anas *rubripes*	0	0	0	0	2	1.9
Pintail	Anas *acuta*	0	0	0	0	1	0.9
Blue-winged Teal	Anas *discors*	0	0	0	0	1	0.9
Green-winged Teal	Anas *crecca*	1	3.5	1	4.7	0	0
Ring-necked Duck	*Aythya* collaris	0	0	0	0	2	1.9
Prob. Greater or Lesser Scaup	*Aythya* cf. *affinis/marila*	2	7.1	1	4.7	0	0
Common Goldeneye	*Bucephala clangula*	0	0	0	0	2	1.9
White-winged Scoter	*Melanitta* fusca	0	0	0	0	0	0
Red-breasted Merganser	*Mergus serrator*	0	0	0	0	2	1.9
Northern Goshawk	*Accipiter gentilis*	0	0	0	0	1	0.9
Red-tailed Hawk	*Buteo jamaicensis*	1	3.5	1	4.7	0	0
Ruffed Grouse	Bonasa *umbellus*	5	17.8	3	14.2	10	9.9
Wild Turkey	*Meleagris gallopavo*	3	10.7	2	9.5	0	0
Sandhill Crane	Grus *canadensis*	0	0	0	0	1	0.9
Gull species	Larinae sp.	0	0	0	0	1	0.9
Passenger Pigeon	Ectopistes *migratorius*	7	25	6	28.5	53	52.4
Barred Owl	*Strix vans*	1	3.5	1	4.7	2	1.9
Yellow-bellied Sapsucker	*Sphyrapicus varius*	2	7.1	1	4.7	0	0
Northern Flicker	*Colaptes auratus*	1	3.5	1	4.7	0	0
American Crow	Corvus *brachyrhynchos*	0	0	0	0	3	2.9
Common Raven	Corvus *corax*	0	0	0	0	3	2.9
TOTAL		28	100	21	100	101	100

For clarity of presentation, probable identifications-such as *Branta* cf. *canadensis,* or goose, probably Canada goose-have been merged with positive identifications.

bird elements identified to useful taxonomic level, and lend the sample an appearance of economic focus. While passenger pigeon is the most abundant species in the ASI sample in terms of NISP and MNI values, it comprises just one quarter of the unworked avian bone. The passenger pigeon falls within the small-to-medium size range, and its relative abundance is not likely to be effected by any size-related recovery bias. It is likely that among the provenience units in the Hamalainen sample is one or more associated with harvest level procurement of this prolific resource. Such a unit was not identified within the primary ASI sample; the seven passenger pigeon elements were scattered among six features dispersed among four houses and two exterior areas.

When an assemblage includes just a few specimens or individuals per species, as is the present case, it is advantageous to consider groups of species in combination, related on the basis of common factors such as habitat, procurement method, etc. Upland game bird species (wild turkey, ruffed grouse, and passenger pigeon) comprise a substantial portion of both samples - 54 percent of the ASI assemblage and 62 percent of the Hamalainen assemblage.

At least some of the passenger pigeon in the ASI sample appear to have been taken during the fall migration. An entire tibiotarsus from Feature 164 in House 8 has an incompletely ossified proximal epiphysis and an epiphyseal line remnant at the distal condyle. The central half of a humerus from the wall trench of House 3, which is identified as probable passenger pigeon, retains a minor amount of juvenile cortex. This indicates the presence, in two widely separated contexts, of full-sized individuals still retaining traces of juvenile characteristics.

Two wild turkey elements from Feature 25 of House 4, are probably fragments of the same left innominate. They have pronounced juvenile cortex, and in size and development appear just slightly more mature than a seven-week old reference specimen. This suggests a summer or warm weather procurement event. One other wild turkey element, recovered from Midden 2 (supplementary sample), is a central half section of a right ulna. It has juvenile cortex, and it is somewhat smaller than a tenmonth old reference specimen. This suggests a cold weather procurement event, but because the wild turkey is a slow-maturing bird, and its developmental sequence is not well documented, the significance of the latter observation is difficult to evaluate. On the basis of this admittedly tenuous evidence, it would appear that the wild turkey procurement was not limited to a single season, and was most probably opportunistic.

Species which are known to forage in cultivated fields include the Canada goose, the sandhill crane, the crow, and the raven. Combined NISP totals for these species are 11 percent and 20 percent of the ASI and Hamalainen samples, respectively (including identifications to the level of Tribe Anserini, which includes all geese). These species could have been procured most easily in the horticultural fields immediately adjacent to the village, but the Canada goose and sandhill crane may also be found in riverine and marshy habitat, which other faunal evidence indicates were exploited by the Parsons inhabitants.

The largest and best preserved specimens of the Parsons site Canada goose sample were checked at the extensive comparative avian skeletal collection of the Royal Ontario Museum's Ornithology Department. A few of the elements examined, most particularly a specimen from Midden 4, appeared to be well within the size range for *Branta canadensis maxima,* the giant Canada goose. The difficulty in working with avian bone from zooarchaeological collections, however, is the extreme rarity of intact major long bones. Inevitably, it is impossible to take the critical longitudinal measurements used to define osteologically the various subspecies, and one must resort to inconclusive size comparisons from broken condyle and midshaft sections.

A comparison between surface feeding and diving waterfowl species shows a bias towards the latter. Surface feeders present in the assemblage include the black duck, pintail, blue-winged teal, and green-winged teal. Among the divers are the common loon, bay ducks (including the canvasback, ring-neck, and one of the scaups), sea ducks (including the common goldeneye and the white-winged scoter), and the merganser. The diving species are more likely to be found in the deeper waters of the lower Humber, and in Lake Ontario than in the smaller tributary streams in the uplands near the site. Geese have been omitted from this comparison because they occupy such a wide variety of habitats. The ratio between surface feeders and diving birds, in terms of percent of avian specimens identified to analytically useful level, is seven to 11 percent and five to nine percent for the ASI and Hamalainen samples, respectively. The results show a bias of at least two-to-three or more in favour of species which prefer the deeper waters of downstream and lacustrine habitats. Although based on only 19 elements, this trend would seem to be reliable since it appears in both samples. While these data do not imply that the occupants of the site focussed on downstream and lacustrine avian resources, since the frequencies involved suggest a casual or opportunistic exploitation pattern, they do point to at least occasional downstream forays.

Mammals

The mammal components of the ASI and Hamalainen samples (Table 76) are similar in that the pattern is relatively diffuse, with modest peak values for deer and Canis sp. (domestic dog and probable domestic dog).

Two of the Parsons species - the red squirrel and eastern chipmunk - fall into Stahl's (1982) small mammal range, and the ability to maintain large numbers in culturally disturbed habitats applies at least as well to the grey squirrel and woodchuck, if not also to leporids (hares and rabbits). Furthermore, the actual economic importance of a species may increase out of proportion to its caloric contribution to the annual diet, if it can be procured during a lean season (Thomas 1988).

Combined figures for small herbivores (eastern cottontail, snowshoe hare, grey squirrel, red squirrel, woodchuck, and eastern chipmunk) are 20 percent NISP (19 percent MNI) for the ASI sample and 23 percent NISP for the Hamalainen sample. Taken cumulatively, therefore, this suite of species represents a modestly significant resource. Projectile weapons can be used to procure these animals, but trapping would be more efficient.

At almost ten percent, the woodchuck specimen frequency in the Hamalainen sample appears unusually high. However, Hamalainen suspected that part of the 78 woodchuck elements in his sample was a major portion of a single immature woodchuck carcass. Most of

Table 76. Comparison of the Mammal Components of the ASI Collection (Worked Bone Excluded) and the Hamalainen Collection (1982:G31).

Common Name*	**Taxon***	ASI **Primary Sample**				**Hamalainen Sample**	
		NISP	% NISP	MNI	% MNI	NISP	% NISP
Eastern Cottontail	*Sylvilagus floridanus*	2	1.7	1	1.5	2	0.2
Snowshoe Hare	*Lepus americanus*	0		0		3	0.3
Grey Squirrel	*Sciurus carolinensis* -	7	6.1	3	4.6	9	1.1
American Red Squirrel	*Tamiasciurus hudsonicus*	8	7.0	3	4.6	8	1.0
Woodchuck	*Marmota monax*	4	3.5	4	6.2	78	9.9
Eastern Chipmunk	*Tamias striatus*	2	1.7	1	1.5	4	0.5
American Beaver	*Castor canadensis*	9	7.8	6	9.3	67	8.5
Muskrat	*Ondatra zibethicus*	4	3.5	2	3.1	35	4.4
Domestic Dog**	*Canis familiaris*	23	20.1	18	28.1	223	28.3
Wolf	*Canis lupus*	0		0		5	0.6
Red Fox	*Vulpes vulpes*	0		0		8	1.0
Grey Fox	*Urocyon cinereoargenteus*	0		0		1	0.1
Fox sp.	Canidae (fox-sized)	0		0		3	0.3
American Black Bear	*Ursus americanus*	7	6.1	**3**	4.6	110	13.9
Raccoon	*Procyon lotor*	4	3.5	3	4.6	17	2.1
American Marten	*Martes americana*	1	0.8	1	1.5	3	0.3
Fisher	*Mattes pennanti*	0		0		3	0.3
Striped Skunk	*Mephitis mephitis*	6	5.2	1	1.5	0	0
River Otter	*Lontra canadensis*	0		0		1	0.1
Bobcat	*Lynx rufus*	0		0		1	0.1
Wapiti	*Cervus elaphus*	1	0.8	1	1.5	1	0.1
White-tailed Deer	*Odocoileus virginianus*	35	30.7	16	25.0	203	25.8
Moose	Alces Alces	0		0		1	0.1
Cervid (Antler)***	Cervidae sp. (Antler)'''	(3)				(16)	0
TOTAL		113	99.1	63		786	99.8

*Euro-Canadian farm animal species are excluded. For clarity of presentation, probable identifications-such as Martes cf. *pennanti,* or probable American marten-have been merged with positive identifications.

**Excluded from Hamalainen's total for domestic dog are 25 elements derived from the burial of an immature individual (Hamalainen 1982;G19).

***Fragments of cervid antler are excluded from NISP percentages and from MNI calculations.

the 22 immature woodchuck elements in his sample were packed in a single bag and could be attributed to a single individual (Hamalainen 1982:G19, G37). The remains of woodchucks which have died in their burrows are occasion-ally encountered on southern Ontario archaeological sites, but they are not always recognized by excavators as potentially intrusive. Subtraction of these specimens would lower the woodchuck percentage in Hamalainen's total identified mammal sample by approximately two percent.

Frequencies of aquatic rodents (beaver and muskrat) are nearly equal in both samples. Aquatic rodents comprised 12 percent of the identified mammal elements (13 percent MNI) in the ASI sample and 13 percent in the Hamalainen sample.

High element frequencies for the domestic dog occur in both samples. The occurrence of European domestic species in both samples raises the possibility that some of Parsons Canis material was derived from recent Euro-Canadian farm dogs or pets. It appears safe, however, to assume that all or almost all of the Parsons dog elements pertain to aboriginal dogs since Euro-Canadian dogs are usually disposed of as burials, and because none of the Canis bone in the ASI sample came from a burial context. Moreover, a dog burial, which was included in the material Hamalainen analyzed (1982:G6, G19-G20), was excluded from the figures presented in Table 76.

While dog sizes ranged from medium (reference specimen FA-203-6) to large (FA-1019C), taking into account developmental status or shrinkage from calcination, none appeared to even approach the smaller female wolf size range.

The dog remains have every appearance of being subsistence debris. Of 23 unworked items, nine were thermally altered, and four bore animal gnaw marks. A mandible specimen bore marks apparently resulting from cutting the insertion of the masseter muscle subsequent to disarticulation of the jaw. A comparatively high proportion of the dog elements (as well as fox) were used industrially. Seven specimens were worked, including four beads or tubes, two pieces of bead or tube manufacturing waste, and one awl.

Deer is the most frequently represented species in the ASI sample and has a comparable level of representation in the Hamalainen sample. The body portion representation illustrated in Figure 38 indicates that the head area was well represented and that distal appendiculars account for almost 60 percent of the deer sample. The areas with the most meat attached, the proximal limb bones and trunk elements, on the other hand, are rather less well represented. This pattern is reminiscent of Perkins and Daly's (1968) "schlepp effect," except for the relatively high representation of head elements. The schlepp effect pattern is indicative of long-distance transport, and involves skinning the animal, leaving the distal appendiculars attached, and placing the dressed meat in the skin. This practice results in maximizing the nutritional value of the payload relative to its mass.

Another approach to examining body portion representation is to use Uerpmann's method of dividing the elements into three groups based on the relative amount of meat associated with the bones (Uerpmann 1973). The first group includes the vertebral column (less tail), the pectoral and pelvic girdles, and the proximal limb bones. The second group consists of the lower limb bones, brain case, mandible, ribs, and sternum. The final group includes the facial bones, tail vertebrae and distal appendicular bones. The element representation for these groups is two, seven and 23 respectively. These figures illustrate the relatively low representation of the heavy, high-yield elements, reinforcing the notion that the recovered elements reflect the results of long distance transport of hides, dressed meat, crania and some distal appendicular elements from kill sites.

Neither the Perkins and Daly (1968), nor the Uerpmann (1973) approaches take into account the industrial value of certain elements at the central and low end of Uerpmann's scale. The high representation of head elements may be related to the use of deer brains for hide-tanning, which was the most ubiquitous method of hide processing in North America (Driver and Massey 1957:343-344). Also, the high representation of distal appendiculars may be due to the importance of deer metapodials (cannon bones) for tool production.

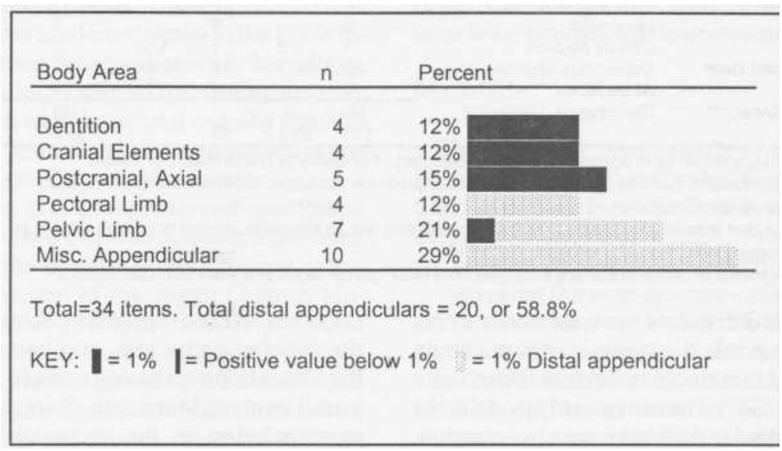

Figure 38. Deer Body Portion Representation, Primary Sample, Unworked Elements.

Substantial amounts of black bear remains appear in both samples, but are twice as frequent in the Hamalainen sample. This suggests that the species was taken with moderate frequency and that its remains have a patchy distribution. The occurrence of five of the nine black bear elements in the ASI sample from one feature (Feature 152 of House 8) supports this inference. All of these appear to have come from a young individual - an unworn incisor, two relatively small cranial fragments, and two distal appendicular elements with juvenile characteristics.

Although skunk accounts for a comparatively high proportion of the ASI mammal assemblage (five percent NISP, two percent MNI), all elements were tail vertebrae derived from a single context (House 7, Feature 141).

Although the excavation method precluded observation of relationships between articulated elements, it may be suggested - on the basis of the comparable maturity of all vertebrae and their apparent lack of duplication - that they came from a single series, representing most of the anterior and central tail. This find was discussed in greater detail in the description of the worked bone material recovered from the site (Thomas, Worked Bone and Antler, this volume).

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