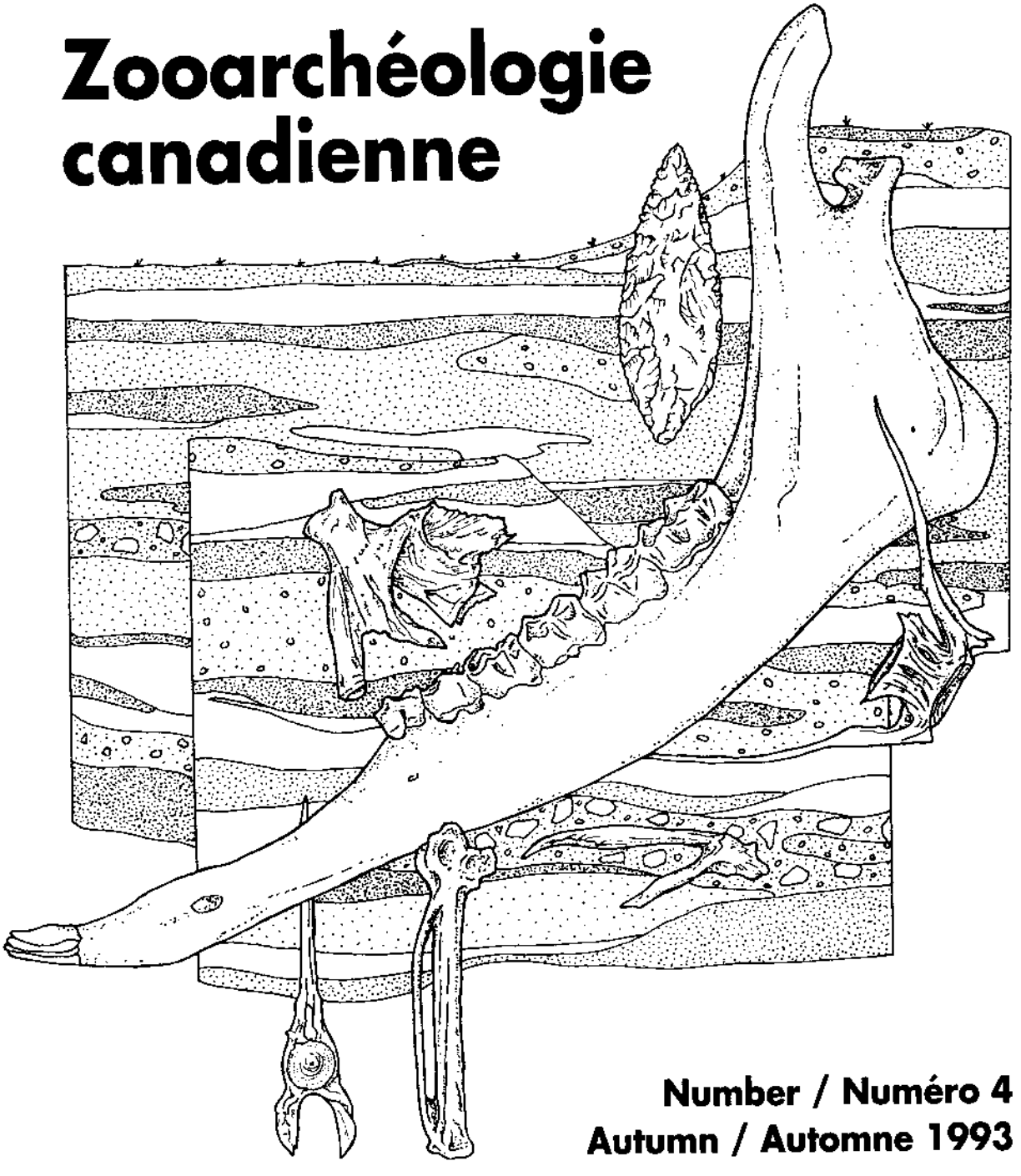
# Canadian Zooarchaeology

# Zooarchéologie canadienne



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## EDITOR'S NOTE/ NOTE DE L'EDITEUR

I am very pleased to be able to feature in this issue Frances Stewart's article on the history of zooarchaeology in Ontario. Fran's detailed and excellently-researched article shows that zooarchaeology in Ontario has long roots, with the first interests in archaeological faunal remains going back to the 19th century. Her article also shows the influence of certain individuals in the history of Ontario zooarchaeology, starting with James Coyne and W.J. Wintemberg and their initial reconstructions of aboriginal subsistence from faunal remains. More recently, researchers such as Howard Savage have been active in building comparative skeletal collections and training future zooarchaeologists.

I am happy to publish any letters or comments on Fran's paper, or on any of the papers published in *Canadian Zooarchaeology*. And if anyone has any articles relevent to zooarchaeology in Canada, please submit them for possible publication.

I would like to thank all of you who have subscribed to the 1993-1994 issues - we have some interesting features in the next issues, including regional histories on BC, the Plains, the Maritimes and the North. Thanks to Donna Naughton who has worked as editorial assistant on this issue. Have a good fall!

*Kathlyn Stewart, Editor*

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**Cover drawn by Debbi Yee Cannon**

# A HISTORY OF ZOOARCHAEOLOGY IN ONTARIO

Frances L. Stewart*

## Ethnographic Archaeology and the First Museum Collections and Reports: 1840 to 1899

Unlike the situation in the United States, archaeology in Ontario appears to have begun without G.R. Willey and J.A. Sabloff's (1980) Speculative Period. Rather, the first concerted archaeological efforts were surveys aimed at locating the historically documented sites of the Jesuit Missions. This period of Ethnographic Archaeology (Trigger 1985b:57) began with the investigations of Rev. Pierre Chazelle in 1842 in Huronia (Hunter 1900:56). Throughout this initial period, most sites were ransacked by curio seekers (Dade 1852) who had no place to curate their finds or to study them until the incorporation of the Canadian Institute in 1851 and the appearance of its publication, the Canadian Journal in 1852. In that year, the Institute published a questionnaire asking about sites, artifacts, human skulls, pictographs and Indian place names, but no mention was made of animal remains (Canadian Journal 1852 Sept.:25). This request for information and for donations of artifacts as well as its recommendation for respect to be paid to burials, set a new tone for Ontario archaeology, but the response to it was weak (Killan 1981:8).

This more rigorous approach to data collecting was augmented by the arrival at the University of Toronto, in 1853, of Daniel Wilson who, having excavated in Scotland (1851), brought European methods and finds to the attention of his Canadian contemporaries (1854, 1855a). Editing the New Series of the Journal, he reprinted a British paper on the "Value of natural history to the archaeologist" in which the emphasis was on the bones of extinct animals found with human burials (1856:191). He was particularly interested in human remains and in his 1855 directions on their excavation, he stated that "the nature and relative position of any relics, such as urns, implements, weapons, &c., should be carefully noted: and among such, particular attention is to be paid to animal remains, such as the bones and skulls, horns or teeth, of beasts, birds and fishes. It is a common fashion among savage tribes to hold a burial feast over the grave of the dead, and such relics may tend to throw considerable light on the habits of the people as well as on the period to which they belong" (1855a:347).

Despite Wilson's interests, it remained for his successor, David Boyle, to establish a museum of Canadian antiquities and a journal devoted exclusively to archaeology (Killan 1981:13). Boyle instituted the Archaeological Report of the Canadian Institute in 1886 (1888) and continued as editor of the Annual Archaeological Reports to the Ontario Department of Education until 1908.

Boyle's primary interest was in acquiring artifacts for display. In his first "Annual Report" (1888), he published a circular which was almost identical to the questionnaire published in 1852. However, he changed item 7 to include bone weapons. Yet, except for worked pieces and especially modified shells, Boyle generally ignored faunal remains. (An extraordinary interest in shells by the

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early archaeologists goes back at least to Wilson (1855b)). Boyle's reports included descriptions of the functions and methods of manufacture of shell, bone and antler artifacts. Those collectors whom Boyle encouraged, including Andrew F. Hunter and George E. Laidlaw, also disregarded faunal material. The few non-artifactual faunal specimens added to the collections were skulls, mandibles or loose bear or beaver teeth, usually from graves.

Boyle also excavated. In searching for village locations, he considered soil type and the proximity of nut-bearing trees, clay and water but he made no mention of animal resources (1889:12). In 1889, the only faunal remains he saved from a large midden were "three skulls of common deer" (1889:15). However, by 1891, he saved "50 bones, various" in addition to a much higher number of worked bones from the Southwold Earthwork (1892:20). Even this minimal attention to faunal material likely reflects the influence of James H. Coyne, who was in charge of the excavations. In Coyne's brief description of the material recovered from one of the "ash-heaps" (middens), he noted that despite previous frequent excavations: "There still remained, however, arrow-heads and chips of flint, stones partially disintegrated from the action of heat, fragments of pottery..,fish-scales, charred maize and bones of small animals, the remains of aboriginal banquets." (1893:22-23).

Coyne quoted ethnohistorical accounts of hunting and plentiful game to support his conclusion that the Indians were hunters and fishers as well as agriculturalists. He was unusual in his consideration of food refuse, as was W.G. Long, who excavated at the Serpent Mounds in 1896. Faced with numerous large shell middens, Long commented that local Indians regarded mussels as a starvation food (Boyle 1897:33). The role of shellfish in Indian diets is still debated by faunal analysts. Boyle too referred to the Jesuits' accounts but he was unwilling to accept their observations of food scarcities. He seems to have believed in the noble savage in harmony with a bountiful environment.

By 1899, a greater interest in subsistence was developing. Laidlaw supposed that Indians lived on the products of cultivation, some wild fruits, a little game, and a considerable quantity of fish. Some of the available fish and a discussion of fishing techniques were included in his report on Victoria County (1900:45), in which he also mentioned fishing camps (ibid.:46). Hunter postulated that the fish in the Sturgeon River had attracted Indians and noted the problem of distinguishing fishing camps used seasonally over many years from village sites (ibid.:1899:55), but still his main purpose was "to throw light upon the positions of those early missions of which Ste. Marie was the centre;..."(ibid.). It was William J. Wintemberg's first report on the "Indian village sites in the counties of Oxford and Waterloo" which revealed the greatest interest in natural resources; in places it almost rings of environmental determinism (1900:86). This is unlike any of the previous reports. However, like them, emphasis was given to artifacts, notably those made of shell. Like Boyle and Laidlaw, Wintemberg sometimes attributed functions to the artifacts on a purely speculative basis, but his report is noticeably different in that he supplied the scientific names for the modified shells.

Heightened Interest in Faunal Remains: 1900 to 1911.

The Annual Report for 1900 reveals the new direction in which Wintemberg was moving. In it he shows that he was not merely recording sites and collecting artifacts for display but rather was building a chronology (1901:37). Of significance to the development of faunal studies was his recognition that older "pre-Neutral" sites might lack bone relics because these were not preserved (ibid.: 39), and his efforts to determine the species of shells accurately. In pursuit of the latter, Wintemberg had Dr. J.F. Winteaves, of the Geological Survey of Canada, examine the shells. This is the earliest record (1901) of faunal material from Canada being sent to a specialist for identification (ibid.:39).

The first published Ontario faunal report appeared in 1902. Written by Dr. W. Brodie, it was on "animal remains found on prehistoric Indian village sites, ... based largely on personal researches over ten such sites situated in the county of York and the township of Pickering, extending over half a century" (1902:44). Provenance data was weak, but the animals were identified to species, listed in phylogenetical order, and their habitats were described. A few comments were made on the suitability of their skeletal elements for tools and on their relative abundances in the sample. Skulls and jaws were emphasized, but a small amount of infra-cranial material also was identified. The same year (1902) saw Wintemberg's publication on fish weirs.

This interest in animal remains affected Hunter who speculated that "perhaps the thick population [in Simcoe County] was due to the good beaver hunting and fishing along the [Sturgeon] river" and conversely, that the scarcity of sites along the Coldwater River was due to the fewer beaver and fish in it (1902:62). Still, he ignored faunal remains in his inventory of 75 Medonte township sites (ibid.), as did Laidlaw in his on North Victoria (1902).

The initiative of Wintemberg and Brodie continued in the Report for 1902. Its "Accessions" section reveals that Wintemberg saved some unworked shells and fish scales, although few bones. His review of Blenheim township included a paragraph each on rivers, fauna and flora (1903). R.T. Anderson, a student at the University of Toronto, saved many more unworked specimens, including long bones and vertebrae. His report on Lake Erie sites had a section on animal remains (1903:85-86) in which, like Brodie, he combined the material from several sites and listed the represented species phylogenetically. However, Anderson gave equal importance to infra-cranial and cranial bones and he pleaded for more attention to faunal material: "One of the most interesting branches of study, and one that has been too long overlooked, is that of the animal remains found in the sites. From a study of the bones in such places, many valuable facts can be learned in connection with the animals used as food, and their relative abundance" (1903:85). Similarly, F.W. Waugh discussed the value of fish bones in "throwing considerable light on the domestic economy of the Neutrals" (1903:74), and the following year, he donated "various animal bones" to the museum.

Despite these statements, the accessions lists and most of the articles continued to be dominated by descriptions of artifacts. Boyle (1904:82-87) argued, contra William

M. Beauchamp of New York (1902/1904: 87-88), that bone combs had been manufactured by prehistoric Indians. Hunter (1903, 1904) and Laidlaw (1903a,b, 1904) continued to ignore the unmodified faunal materials they must have encountered. In the 1904 Report, Boyle discussed both tooth (1905:20-22) and bone (ibid.:32) tools, and printed a letter from Flinders Petrie supporting the ability of Indians to manufacture bone combs without metal tools. Thus, the functional approach to artifact descriptions still dominated, but the debates about when tools were manufactured reflected the developing interest in chronology. In 1905, Wintemberg published "Are the perforated bone needles prehistoric?", followed by a typological classification of bone and horn harpoon points (1906:33-56). In 1907, the usual section on "Bone and Horn" was deleted from the "Additions to the Museum" although three whale vertebrae were accessioned that year. The Report for that year also included Wintemberg's paper on "The use of shells by the Ontario Indians" (1908).

Boyle died in 1911, the same year as, after a lapse in publication, the Annual Report reappeared, edited by Rowland B. Orr. From then until its demise in 1928, the Report contained ethnographic papers with only a few exceptions. Orr proposed a three age system: wood-bone-stone (1911:64) and noted that there were fewer bones in Canadian and American museums than one would expect. Earlier Beauchamp had supposed that "a wood or bone age...preceded that of stone, leaving few memorials" (1902:247). Perhaps this, combined with the local expertise of Whiteaves, partly explains the greater emphasis on shells than bones in the reports. In 1911, again echoing Beauchamp (1902:252), Harlan I. Smith (1911) argued that quantities of bone, antler and shell would only be obtained when qualified experts excavated sites, thus raising the question of sampling effects which is still an important issue in faunal studies. In 1912, the first article on an archaeological fishing camp in Ontario was published (McCall 1912), but it concerned net sinkers not fish bones. Similarly, Orr's (1917) article on fishing was about tools. Nothing directly related to faunal studies is found in any of the reports after 1917 (Orr 1917 to 1929), although a few mounted animal skeletons were added to the museum collections.

## Wintemberg and Subsistence Studies: 1920 to 1940

The oblivion into which subsistence studies fell in Ontario after 1911 was changed in the 1920s, primarily by Wintemberg, a protégé of Boyle and then of H. Smith who was aware of the work of Beauchamp and Arthur C. Parker in New York. Beauchamp's reports (1890, 1898, 1900, 1905) like Boyle's, emphasized the functions of shell and bone tools using ethnohistorical information. Parker followed a similar pattern in his work on the Ripley Site (1907). The focus of his report was the human burials, but associated animal remains were mentioned and those from village pits were described. As in Ontario, shellfish were presented with their Latin names, whereas the mammals, birds and fish were referred to only by their common ones. There was no indication in this account of the relative proportions of the species or of the specific elements, and no consideration of the subsistence practices of the Erie

Indians. Smith, on the other hand, gave subsistence the highest priority in his Fox Farm Site report (1910) and it was this report that Wintemberg adopted as a model for his publications.

Wintemberg was also influenced by Waugh. Waugh's Iroquois Foods and Food Preparation appeared in 1916 and was referenced by Wintemberg in his first site monograph published in 1928. Waugh followed the tradition of relying heavily on ethnohistoric and ethnographic accounts. His book is dominated by "vegetal foods", with only ten of the 154 text pages on "animal foods", but throughout there are references to uses of animals and their skeletal elements. A major focus in Waugh's work, which was not a part of Smith's or Wintemberg's reports, was information about folklore and rituals related to food. On the other hand, Waugh ignored the manufacturing of tools. Thus, the work of Waugh and Wintemberg was complementary.

As Trigger noted (1978:10-11), Wintemberg's reports on the Uren (1928), Roebuck (1936), Lawson (1939), Sidey-Mackay (1946) and Middleport (1948) sites followed Smith's format with only minor alterations. The most prominent theme of both men's presentations was subsistence. A section on local animal and plant resources preceded those on securing food, preparing food, and tools used acquiring food (many made from skeletal elements and assigned to the sex which it was assumed had used them, an early example of "engendering archaeology"). After these topics came warfare; manufacturing; dress and adornment; games, amusements, objects of religion, and smoking; miscellaneous items; and decorative art objects. Unlike Smith's Fox Farm report, burials were placed at the end. Wintemberg was trained in archaeological methods by Smith in the field (Wintemberg 1936:1) and later at the National Museum (Trigger 1978:8), but, as noted above, he had already shown his own interest in zooarchaeological matters. In 1919, he published "Archaeology as an aid to zoology" and in 1921, "Archaeological evidence concerning the presence of gray fox (Urocyon sp.) in Ontario."

Wintemberg's treatment of faunal remains was unusually detailed. In his first major report, on the Uren Site, in the "Animal Food" section, he provided a figure for the total number of faunal remains found before discussing the specific animals in phylogenetical order. Approximate rather than actual numbers (NISPs) and percents were given and often these figures were for the classes as a whole only. Within their classes, species were listed in order of frequency only. He commented on the fragmentary nature of the remains, on burnt bones and on chewing by dogs; the first time taphonomy was considered in print in Ontario. Furthermore, the question of whether mouse bones were intrusive or represented food refuse was raised for the first time. Thus, while Wintemberg's records are imprecise, the Uren report is impressive for its time.

Unfortunately, less precise recording marred the later Roebuck monograph (1936). Although the remains were discussed by classes and within the classes, the species were listed in order of abundance, there is no indication of the actual numbers of any of these remains or of which parts of the animals were recovered. The reason for the slackening of standards for the faunal material is not apparent. For both monographs, Gerrit S.

Miller, Division of Mammals, U.S. Nat. Museum, and Alexander Wetmore, Ass. Secretary of the Smithsonian Institution, studied the mammals and birds respectively, so the discrepancy did not likely result from analytical procedures. For all of Wintemberg's research, the fish, bird and mammalian remains were identified by American zoologists. Wetmore consistently identified the bird bones and the mammal bones from the different sites were usually identified by Miller. However, Remington Kellog, Assistant Curator of Mammals, U.S. National Museum, identified some of the mammalian material from the Lawson Site. The shells were analyzed in Toronto by Chief Justice Latchford and later in Ottawa by A. LaRocque of the Geological Survey. Perhaps Wintemberg realized that the faunal material from Roebuck had not been collected carefully enough to merit precise figures? Since he did not describe the excavation techniques, this possibility cannot be assessed, but Roebuck was his first major excavation.

With the Lawson report (1939), quantitative recording reoccurred for the bones. The posthumously published Sidey-Mackay report (1946) was very detailed for the vegetal remains but like Roebuck, limited in its poor presentation of the unmodified faunal material. Good numbers and measurements characterized the modified skeletal elements in all the reports. Wintemberg's reports contained more subsistence information than others published in the region at the same time (see for example Harrington 1924:249-253). While his work relating to settlement data deserves criticism (Trigger 1985a), the prominence he gave to subsistence issues was laudable.

## Chronology and Subsistence Studies: the 1940s to the 1960s

Just as subsistence issues were ignored in the Annual Reports after Boyle's death, so too the posthumous publications of three of Wintemberg'sarticles (1942, 1946, 1948) marked the end of interest in faunal remains in Ontario for about 20 years. In one of these (1942), Wintemberg applied the Midwestern Taxonomic System (McKern 1939), combining it with Ontario's traditional ethnohistorical approach. Chronology based on pottery styles was firmly established in the northeast with Richard S. MacNeish's "Iroquois Pottery Types" (1952) and it continued to dominate the field through the publication of James V. Wright's "The Ontario Iroquois Tradition" (1966) until the late 1960s. However, two important historical ethnographies with functionalist formats and subsistence information were published in the 1960s. Both Elisabeth Tooker's (1964) "An Ethnography of the Huron Indians, 1615-1669" and Trigger's (1969) The Huron: Farmers of the North are indispensable tools for studying the Huron. During this period, middens were excavated in order to recover large quantities of pottery, not for display, but for seriation. Non-ceramic artifacts, particularly the plentiful bone ones, were largely ignored, because they were not seen as period indicators.

Throughout this period, faunal remains were ignored, except in a few instances. At the Royal Ontario Museum, as early as 1959, Walter A. Kenyon (1959:1) acknowledged the assistance of Randolph L. Peterson and Stuart C. Downing from the museum's Department of Mammalogy, W.B. Scott from Ichthyology and Herpetology and L.L. Snyder from

Ornithology, with the identification of remains from the Inverhuron site. The staff at the ROM also assisted Richard B. Johnston (1968), of Trent University, with remains from the Serpent Mounds, with Peterson and Downing again examining the mammalian elements, James L. Baillie the birds, and Edward J. Crossman the fish. That same year (1968), Kenyon published his report on the Miller Site and for its faunal sample, he obtained the assistance of C. S. Churcher from the Department of Vertebrate Palaeontology, Scott and Crossman from Ichthyology and Herpetology, and D.H. Baldwin from Ornithology. From the texts, it appears that it was the faunal artifacts and grave goods that were accorded the most attention. In the Inverhuron report (1959), there was an Appendix listing the species sorted by culture and class but there was no indication of the numbers of elements.

A similar level of interest in faunal remains existed at the National Museum in Ottawa. Wright's prefaces to his major reports in the 1960s (Donaldson Site 1963; The Ontario Iroquois 1966; The Laurel Tradition 1967; and The Bennett Site 1969), reveal that unmodified fish, mammal and shell remains were identified by Donald E. McAllister, Phillip M. Youngman and Arthur H. Clarke respectively, all zoologists at the National Museum of Natural Sciences, National Museums of Canada. Bird and amphibian bones were not analyzed (Wright 1969:60) but by 1969, the reptile remains "were tentatively identified" by Francis Cook also of the National Museum. However, the results were reported merely as species, listed in order of frequency, and the material from only one site was mentioned in Wright's text defining the Ontario Iroquois (1966:39). Furthermore, despite "a large sample of bone refuse [being] recovered" from the Heron Bay site, only the tools made from faunal material were described (1967:38). Archaeologists' efforts in subsistence studies were hampered by the lack of scholars working full-time on archaeological faunal specimens; there were none in Canada until the 1970s.

## Processual Archaeology and Subsistence Studies: 1960 to 1990

In the United States, in the 1950s, Theodore E. White's articles on butchering (e.g.1952,1955) included methods for determining MNIs and estimating meat weights (1953). But, perhaps because his material was large faunal samples from single species (such samples are rare in Ontario) of Plains animals (not native to Ontario), there was no response to his findings in Ontario for many years (Stewart and Stahl 1977). Since White was a palaeontologist, Paul W.Parmalee, John E. Guilday and Stanley J. Olsen were "the first full-time specialists working in the field of zooarchaeology during the 1950s and early 1960s" on North American material (McMillan 1991:6). These men set standards of recording and interpreting faunal remains that were eventually followed in Ontario. Olsen also published widely-used, illustrated manuals for identifying faunal specimens. Of greater immediate impact in Ontario was Charles E. Cleland's monograph on "The Prehistoric Animal Ecology and Ethnozoology of the Upper Great Lakes Region" (1966). He also produced the first report on faunal material from an Ontario historical site (1971). But it was the processual, "New Archaeology",promoted by Lewis R. Binford (1962, 1978) in the

1960s and 1970s, and the emphasis on subsistence systems (Flannery 1967) and behavioral archaeology (Schiffer 1976), that resulted in faunal remains being considered important again and in their study being undertaken by archaeologically trained people (Cleland 1976).

An influential book reflecting this new emphasis on subsistence was William A. Ritchie's The Archaeology of New York State (1965). Like Wright's work on "The Ontario Iroquois Tradition" (1966), Ritchie's was organized chronologically. However, Ritchie paid much more attention to subsistence. His first two chapters were titled "The Earliest Occupants - Paleo-Indian Hunters (c.7000 B.C.)" and "The Archaic or Hunting, Fishing and Gathering Stage (c.3500-1300 B.C.)".A lack of skeletal remains limited faunal considerations in the first chapter, but in the second, he included a report on the "Bone refuse from the Lamoka Lake Site" by Guilday, as well as his own comments on fishing (1965:48-50), hunting (1965:50-54), gathering (1965:59) and food preparation (1965:59-62). Guilday's report on the faunal remains from the Frontenac Island Site was incorporated (Ritchie 1965:105-107) as was Guilday and D.P. Tanner's report on the "Vertebrate Remains from the Kipp Island Site" (1965:241-242). Unfortunately, when Ritchie reached the Owasco culture in the Woodland Stage, he greatly reduced the amount of information he presented on subsistence and this weakness was further accentuated in his discussion of the Iroquois. Ritchie nevertheless set new standards for examining "whole cultures within the relatively narrow limits afforded by their archaeological survival" (Ritchie 1965:xv) and for use of the conjunctive approach (Taylor 1948). It is this approach which was popularized by Binford.

With the increasing emphasis on subsistence for understanding archaeological cultures, in 1966, J. Norman Emerson at the Department of Anthropology, University of Toronto, recruited Howard G. Savage, a pediatrician interested in animal skeletons, particularly avian bones at first, to analyze the faunal remains from the MacMurchy Site. Emerson also became the main force behind Savage's being employed at that university in 1969 to build an animal skeletal reference collection and to do faunal research. At the same time, William M. Hurley began working there, where he, assisted by Conrad E. Heidenreich, a human geographer, began a program in palaeoecology and Ontario prehistory with which Savage was associated. Hurley's objectives included "reconstructing the local environments at the time of aboriginal occupation, the relationship of the Indians to the natural environment in terms of their subsistence economy, and the detailing of the extent to which they modified their environment" (Hurley and Heidenreich 1971:6). The first results appeared in two research reports edited by Hurley and Heidenreich (1969, 1971). These included reports by Savage on the faunal material from the Inverhuron (1969b, 1971a), Maurice (1971b), Robitaille (1971c) and Thede (1971e) sites.

In 1969, Savage published an article on the usefulness of faunal analysis to archaeologists and zoologists (1969a). He realized that ideas expressed fifty years earlier by Wintemberg (1919) bore repeating, as he tried to interest more archaeologists in the careful retrieval and analysis of faunal material. He

demonstrated the value of studying archaeological faunal refuse for zoologists in his "Range extensions of vertebrate faunal species by archaeological site findings" (Savage 1971d). Its value to archaeologists was stressed in his teachings. In the early 70s, Savage apprenticed interested students, of which James A. Burns and myself were the first, in the techniques of faunal analysis. In 1973, he began teaching the formal courses in faunal analysis that he has continued to offer each year to both graduates and undergraduates. Through the careful preparation of specimens, the teaching of hundreds of students, each of whom must produce a faunal report as part of the course requirements, and his publications, many on Ontario material, Savage has been instrumental in promoting most of the faunal work done in Ontario and much beyond as well.

Emerson, Hurley, Wright and Savage all influenced William D. Finlayson, who was the first in Ontario to employ flotation techniques to obtain good faunal and floral samples (Finlayson and Byrne 1975). Finlayson has consistently accorded subsistence data an important place in his research (1977, 1980, 1985, Finlayson et al. 1985, 1989). Burns worked with Finlayson on the faunal material from the Donaldson (Finlayson 1977) and the Draper sites (1979a) and I worked with him (1991a,b) on the Keffer Site fauna.

Savage also influenced faunal work at the Archaeological Survey of Canada, National Museum of Man (hereafter ASC). It was on his recommendation that Burns was the first faunal analyst hired by the ASC in 1971 (see Burn's research note in 1973) and that I was hired there in 1972 to analyze material from across Canada (see Stewart's research notes in 1972, 1973a,b). For J. Wright, Burns identified the bones from the Dougall Site, a fishing camp (Wright 1972a). He also analyzed material from a Neutral site excavated by William C. Noble (1975), from the Cayuga Bridge Site excavated by David M. Stothers (Burns 1977) and from the White Site excavated by Brian Hayden (Burns 1979b). For J. Wright, I analyzed the Archaic Knechtel and Iroquoian Nodwell faunal material. Material from the former was incorporated into J. Wright's report (Wright 1972c) as was that from Nodwell in his site monograph (Wright 1974) but the latter was reported in greater detail in the first published Ontario monograph on faunal material (Stewart 1974). For David L. Keenlyside, I supervised the study of Point Pelee sites' faunal remains (Keenlyside et al. 1974).

While a reference skeletal collection was being built at the ASC, plans for another program were being made at the National Museum of Natural Sciences by Anne M. Rick. In 1974 the Zooarchaeological Identification Centre, now called the Zooarchaeological Analysis Program (ZAP), came into being. At present, Rick heads ZAP, Darlene Balkwill is Manager of Vertebrate Zoology collections, and Kathlyn Stewart is the Research Scientist in Zooarchaeology. Toronto and Ottawa remain the major centres of faunal work in Ontario, although other institutions established faunal courses and collections through the 1980s and 1990s (e.g. Dept. of Anthropology, MacMaster University in Hamilton).

Thus, Emerson's interests resulted in Savage working at the Univ. of Toronto and reactivating faunal studies in the province. Emerson's teaching abilities resulted in many of his students following interests in subsistence matters. One of

these students was Noble, who has devoted his efforts primarily to the Neutral. He has included subsistence information in his reports (e.g. 1975) and has encouraged his students to do the same. Rosemary Prevec, in particular, has produced numerous manuscripts on faunal remains from southwestern Ontario, most of which are on file with the Ontario Ministry of Culture and Recreation. (For a listing of her unpublished manuscripts, see Canadian Zooarchaeology 1992 No.2; for a published summary of faunal research in the Neutral area, see Prevec and Noble 1983). Milton J. Wright's M.A. thesis on the Walker Site (published in 1981), excavated under the direction of Noble, included an appendix on the faunal analysis which was undertaken at the Zooarchaeological Identification Centreby A.M. Rick, Elizabeth Silier and Stephen L. Cumbaa. One of Savage's students, Deborah A. Pihl, analyzed the faunal remains from the Neutral, Hamilton and Hood sites for Paul A. Lennox (1981, 1984). Lennox used another of Savage's students, Beverly Smith, for the analysis of the faunal remains from the Bruner-Colasanti Site in Essex County (Lennox 1982) and the faunal remains from the Bogle Sites, two historic Neutral hamlets, were studied by Heather Nicol, another student of Savage (Lennox 1984).

In the extreme east of the province, Pendergast has dominated work on St. Lawrence Iroquois sites and recently, he has supported extensive faunal analyses. His 1981 monograph on the Glenbrook site included an appendix by Rick (1981) and for the Beckstead monograph, the faunal appendix was authored by four of Savage's students (D'Andrea et al. 1984). In 1988, I studied the faunal remains from three longhouses of Pendergast's McKeown Site (Pendergast 1988, 1990; Stewart 1989, 1992) and in the following year, researchers at Ostéothèque de Montréal Inc. (1989) analyzed the rest of the macrofaunal remains from this site.

Good subsistence studies were undertaken by several researchers under R. B. Johnston (1984), on the MacIntyre Site, on Rice Lake. The macrofaunal remains (Naylor and Savage 1984) were compared to the microfaunal ones retrieved by flotation (Waselkov 1984).

It is perhaps not surprising, given the similar training of most of the currently active faunal analysts in Ontario, that the methods of analysis and the formats of the reports are similar. Meticulous identification of faunal specimens to species or to as small taxonomic taxa as possible has been stressed, to provide an accurate base for subsequent analyses. Diet and seasonality estimates have been emphasized, with less attention being paid to other aspects such as butchering and cooking techniques, refuse disposal, taphonomy (but see Savage 1972), sampling effects (but see Hamalainen 1983, Prevec 1985, Stewart 1991a), and artifactual and ritual uses of animals. The nineteenth century interest in bone and shell tools has been revived for the St. Lawrence area by the current studies of J. Bruce Jamieson (1990), but this aspect remains dormant in other regions (but see McCullough 1978). Perhaps in the current post-processual climate, greater attention will be paid to these aspects. Thanks to the foundations laid by Wintemberg, Emerson and Savage, faunal analysis is now well-established in Ontario.

ACKNOWLEDGEMENTS

All the people referred to in this review

are thanked for their contributions to faunal research. I apologize to anyone who feels that his or her contribution has been misrepresented or overlooked. I have considered published material but many students have produced useful studies which await publication and many institutions have financed faunal research. Though unnamed here, their contributions are appreciated. Specifically, for assistance with this review and comments on earlier versions, I thank Drs. Howard Savage and Bruce Trigger. Finally, I thank Dr. Kathlyn Stewart for asking me to do this review and for her work as editor of this publication.

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## FAUNAL SESSION: 26th ANNUAL MEETING OF THE CAA.

Ariane Burke*

Resumé- L'assistance étai nombreuse pour la session zooarchéologique, organisé par Frances Stewart, au cours de la 26e Réunion annuelle de l'Association canadienne d'archéologie tenue à Montréal du 5 au 9 mai, 1993. Neuf communications étaient présentées, sur une diversité de thèmes qui comprennaient: une étude de l'importance relative des peaux de caribou et d'autres fourrures chez les Inuit, par Whitridge; deux communications présentant des reconstructions de comportements de chasse parmis les groupes Thule, basées sur les courbes de mortalité des proies principales (construites dans les deux cas à l'aide des couches de croissance dentaires), par Danielson et par Friesen et Arnold; une reconstruction des activités de chasse et de pêche saisonnières au site de Barrie, dans la région du Lac Simcoe, par Needs-Howarth et Sutton; deux communications présentant un interêt méthodologique général, portant sur l'échantillonage et le calcul des M.N.E., par Cannon et par Morrison, respectivemment; ainsi que deux communications sur l'apport de faunes "négligés", plus précisément l'étude des petite vertébrés et l'étude des insects, par Morlan et Bain; et finalement, une étude expérimentale sur la préparation du bouillon d'os, par Saint-Germain.

Whitridge presented an analysis of hide procurement and exchange strategies among Inuit groups. The relationship between the exploitation of caribou and other fur bearing species was investigated, showing that the importance of caribou hides in Inuit economies, known from ethnographic accounts, may be overemphasized.

The use of zooarchaeological analysis and the interpretation of mortality profiles as a tool for reconstructing past hunting behaviours was explored in two papers, presented by Danielson and by Friesen and Arnold, respectively. Danielson presented a reconstruction of Thule seal hunting behaviour at Hazard Inlet, Somerset Island, stressing the importance of local environment and prey ethology when interpreting mortality profiles. Friesen and Arnold tested an hypothesis of prehistoric beluga drives at Gupuk, an Inuit site on the Mackenzie Delta. A mortality profile of the beluga component of the Gupuk fauna was constructed using incremental analysis. The resulting catastrophic age profile, apparent once age classes were "collapsed" to compensate for small sample size, offered positive proof of beluga drives at Gupuk.

A different kind of reconstruction based on faunal exploitation patterns was presented by Needs-Howarth and Sutton, for the Barrie site, Simcoe County. While also stressing the importance of ethological information, their analysis rested on an assumption of optimizing behaviour in the exploitation of fish, as use of the term "Subsistence Scheduling" in the original paper title indicates. The discussion of seasonal resource use, and the hypothesis of year-round seasonal activity on the site, could perhaps be effectively tested using seasonal indices.

Morlan and Bain each presented insightful papers discussing the applications of a zooarchaeological

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analysis of micromammal and entomological remains, respectively. The possibility of detailed local environmental reconstructions was discussed by each author, with an emphasis on establishing investigative methodologies specifically tailored to the study of small vertebrates and invertebrates. Morlan was also responsible for the most intriguing statistic of the day namely, that 43 hibernating toads can disturb 30,000 $cm^2$ of soil.

From a more general methodological perspective Cannon presented a study of sample effect on a faunal assemblage, and Morrison discussed the problems inherent with the calculation of M.N.E.. Cannon ran a series of model, random "test samples" on an assemblage currently under study, showing that the key factor in a faunal sample is the number of units sampled (units interpreted as clusters of bones within the site) rather than the percentage of the site being sampled. Morrison tied himself (and us) up in a Gordian knot by pointing out that the use of different anatomical locations to produce the M.N.E.is preferred, as it will result in more accurate counts -but that it can seriously affect the comparability of results for different elements (a serious problem when calculating M.A.U.s) -as well as creating problems of aggregation (a serious problem when calculating M.N.I.)!

Finally, using both ethnographic and experimental work, Saint-Germain examined a frequently neglected aspect of carcass utilisation -namely the production of bone "broth". Her results indicate that it is the quality, not the quantity, of the fats skimmed from bone broths, which, are themselves of little nutritional value, which is significant.

In conclusion, it was a well-balanced session in which a variety of research interests was presented, representing a good sample of the different research directions Canadian zooarchaeologists are currently exploring.

## RECENT PUBLICATIONS/ PUBLICATIONS RECENTES

We are still planning to make this section more extensive in future issues!

Carroll, P.S. 1992. From the tundra to the forest: caribou hunters in the Northern Transitional Zone. Manitoba Archaeological Journal 2(1):30-41

Coupland, G., Bissell, C. and King, S. 1993. Prehistoric subsistence and seasonality at the Prince Rupert Harbour: evidence from the McNichol Creek Site. Canadian Journal of Archaeology 17:59-73

Gerlach, C., George, J.C., & Suydam, R. 1993. Bowhead whale (Balaena mysticetus) length estimations based on scapula measurements. Arctic 46(1):55-59

Moulton, A.L. 1992. Mastodonts and habitat inference. Manitoba Archaeological Journal 2(1):47-55

Roberts, L. 1992. Faunal analysis of the 1984-1986 excavations at the Lockport Site, EaLf-1. Manitoba Archaeological Journal 2(1):1-13.

## FORTHCOMING CONFERENCES/ CONFERENCES A VENIR

**Society for Historical Archaeology.** January 5-9 1994. Hotel Vancouver, Vancouver, B.C., Contact: David Burley, Dept. of Archaeology, Simon Fraser Univ., Burnaby BC, V5A 1S6. Tel. 604-291-4196

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