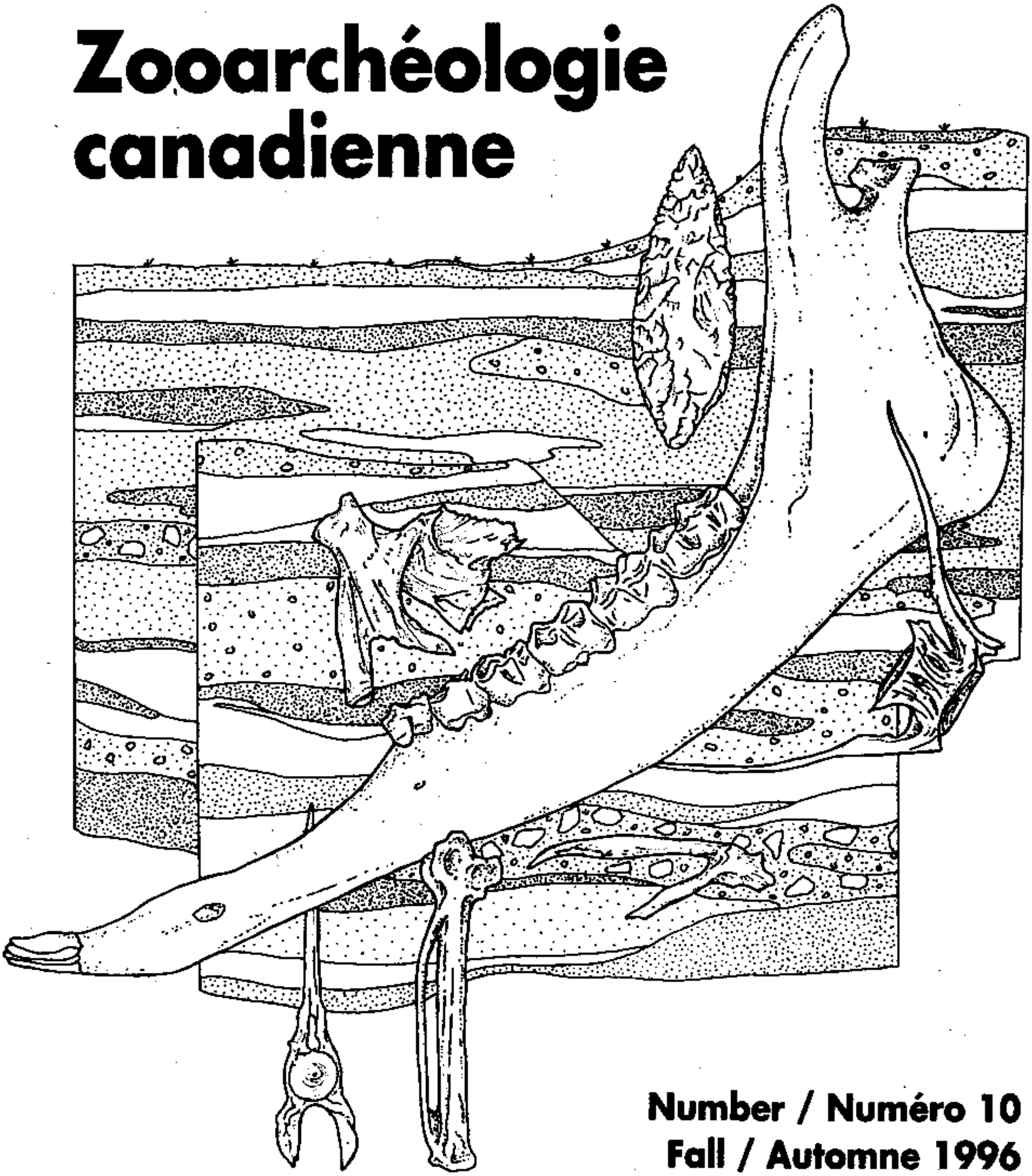
Canadian Zooarchaeology

Zooarchéologie canadienne



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EDITOR'S NOTE/NOTE DE L'EDITEUR

Happy Fall to everyone! In this issue we depart from regional zooarchaeology and focus on two completely different areas, the first being three summer fieldwork\lab reports from a zooarchaeological perspective - one from Canada and two from abroad.

Second, people have expressed interest in reports on the identification and descriptions of bone elements. In the next issues we will include a regular feature by David Campbell and Donna Naughton - vertebrate specialists at the Canadian Museum of Nature - which will discuss unique bones or their unique characteristics. Along these lines, in this issue, we include a descriptive paper by Steve Thomas which describes anuran bones and distinguishing characteristics.

We welcome short articles, reports and comments on our issues! Thanks to Donna Naughton for assistance with this issue. *Kathlyn Stewart, Editor*

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Cover by Debbie Yee Cannon

Differentiation of Selected Frog (*Rana*) and Toad (*Bufo*) Bones Using Morphological and Osteometric Traits

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Not all faunal resources are procured by what might be thought of as classical hunting activity. Each of the various faunal resource species exploited by a specific culture occupy differing points on a continuum of procurement behaviour. At one end of the continuum are large game resources exploited by special purpose groups which include skilled hunters and which sometimes function for protracted periods of time away from the home base or village. Towards the other end of the spectrum are small game resources. These can be hunted or trapped by single individuals operating out of the home base on a time available basis (cf. Steward 1968:326). In terms of procurement behaviour, exploitation of these resources may resemble gathering more closely than big game hunting. These resources generally do not require people to act in large, special-purpose groups. They are generally more evenly distributed over the landscape and are more predictable than large game resources, so that many small game species may be opportunistically exploited close to the home base or village. Their exploitation would involve a certain level of technology—e.g. specialized knowledge, techniques, equipment, and appropriate ritual—but the required technology, at least the archaeologically visible technology, is generally less specialized and elaborate than that related to large mammal procurement.

Within the context of Huronia, large game procurement—including bear, deer, and moose—were often the object of specialized long range hunting parties (Thwaites 15:183; 17:141-3; 23: 63-65; Trigger 1976:41-43). Among the small game taxa exploited in and around the village were leporids, squirrels, and the meadow vole (Sagard 1968:223-224, 227).

At the far end of the faunal resource procurement behaviour continuum are taxa which can be gathered opportunistically, near the home base by hand and by individuals using minimal technology. Among the resources in this category which were reported to have been exploited by the Huron were certain anuran species including the bullfrog (*Rana catesbeiana*) and other smaller frogs (Sagard 1968:235-236). More detailed subsistence data are available for the Iroquois in neighbouring New York State who were closely related to the Huron in terms of general culture. Larger species of frog, such as the bullfrog and leopard frog (*Rana pipiens*) were exploited, their legs roasted and eaten. The smaller wood frog (*Rana sylvatica*) was cooked in corn soup, or was used in dried form for medicine (Waugh 1973:135-136, 132). Although I have found reference to the exploitation of certain species of toad by people in the tropical zone of the New World (Cooke 1989:126-129; 133-134), to date I have been unable to locate references to toad exploitation in the ethnohistorical literature on Iroquoian peoples of the eastern Great Lakes region. Several factors may contribute to the minimal attention accorded anurans in the zooarchaeological literature on Huronia. Perhaps foremost among these is the fragility of anuran bone itself. Careful excavation is essential for the recovery of anuran bones in identifiable condition, so they may be under-represented in assemblages recovered without flotation or fine screening. Beyond this, anurans are generally insignificant from the perspective of total dietary contribution. On occasion they may not represent food items per se, but instead the gut contents of animals which actually were subsistence resources. Finally, they certainly can be hard to identify.

Still, frogs are of interest specifically because they are a faunal resource which occupies an extreme point on the procurement behaviour continuum opposite what one might think of as the "classic" hunted species—bear, deer, and moose. Even considering anuran bones from the perspective of the gut contents explanation, if one could define a cluster of frog elements as probable gut contents, and if one were prepared to move beyond relative dietary importance, one would be in a position to study primary food processing events and their spatial organization.

The fact remains that taxonomic identification of anuran elements can be difficult. That issue is the subject of this paper.

The most useful taxonomic distinction, from the perspective of subsistence behaviour, is made at the generic level. The ethnohistorical literature tells us that frogs were exploited in the Iroquoian part of the eastern Great Lakes. The contrasting dearth of information for toad consumption indicates that toad exploitation was minimal to nonexistent. Toads dig burrows on dry land, and hibernate there in the winter. The fact that some toads would succumb to the physiological stress of hibernation provides a natural means for the intrusion of relatively recent toad remains into archaeological deposits. Except for more terrestrial species such as the wood frog (*Rana sylvatica*), frogs prefer to hibernate in mud under water (personal communication: Ross MacCullough). It is far more usual for toads than for frogs to burrow into archaeological deposits situated on dry land. Because Iroquoian villages are generally sited on dry, well drained land, we may assume that frog remains in Iroquoian village contexts probably got there by cultural means—whether directly as food items or indirectly as gut contents of food items.

It may be desirable from the perspective of habitat and seasonality analysis to identify frog bones to the species level, but this is not necessary for all purposes. The bones of a full grown bullfrog are easily recognized on the basis of size. Beyond this obvious case, within the context of procurement behaviour and dietary importance in southern Ontario, the other members of genus *Rana* may be treated as a single group. The creation of analytical groupings of taxonomically related species—also similar in size, and which can be procured by essentially the same means—is not new, and has been discussed recently in the zooarchaeological literature (see Schmitt and Lupo 1995:497).

Southern Ontario Frogs & Toads in Order of Size

Common Name	Taxon	Size in cm	Range	Page Ref. (Conant 1958)
Bullfrog	*R. catesbeiana*	8.9	15.2	296-297
Green frog	*R. clamitans*	5.7	8.9	300
Leopard frog	*R. pipiens*	5.1	8.9	300
Pickerel frog	*R. palustris*	4.5	7.9	302-303
Mink frog	*R. septentrionali*	4.8	7.0	299
Wood frog	*R. sylvatica*	3.2	7.0	303
American toad	*B. americanus*	5.1	8.9	263-264
Fowler's toad	*B. woodhousi*	5.1	7.6	269-272

An earlier attempt to differentiate frog and toad elements was made by Natalka Cmoc, another of Dr. Savage's students, in "Postcranial differences of the frog and toad: The American toad, the bullfrog and Fowler's toad" (n.d.). Cmoc dealt with the ilium, humerus, and femur.

The focus below is on the ilium, urostyle, and tibiofibula because these were found to be more often recovered in identifiable condition, and because the traits appear to be more easily recognized. Also, the traits chosen here seem to work with a wider range of species: bullfrog, leopard frog, green frog wood frog, American toad, and Fowlers Toad. This work is preliminary. It needs to be tested on a wider range of specimens, and it should incorporate more elements. I have yet to expand this project to include tree frogs (*Hyla*) and chorus frogs (*Pseudacris*).

The Ilium (Fig. 1)

The ilium is easy both to orient and to side. The acetabulum (Fig. 1, point E) is on the lateral side of the posterior end, and the iliac shaft curves ventrally. The points of generic distinction are also easily recognized. In frogs, the iliac crest (Fig. 1, point A) is broad and fin-like, stretching from the acetabulum almost to the anterior end. In toads, the iliac crest is just a small ridge on the dorsal surface of the iliac shaft. The supra-acetabular process is unique to toads (Fig. 1, point D), although in frogs the buttressed posterior margin of the iliac crest may represent an analogous structure. The ventral angle (Fig. 1, point B) formed by the iliac shaft and the acetabular portion of the ilium, is markedly greater in toads. The ventro-anterior margin of the acetabulum (Fig. 1, point C) is appreciably wider in toads than in frogs.

Figure 1. Right ilium, leopard frog (top) and American toad, lateral aspect. Scale = 10 mm.

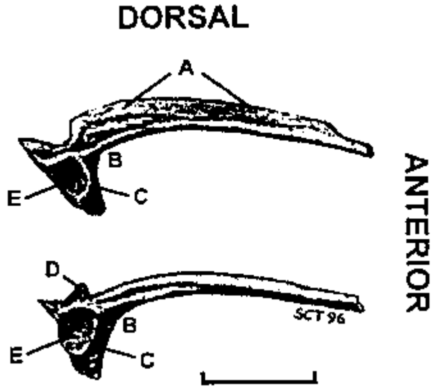
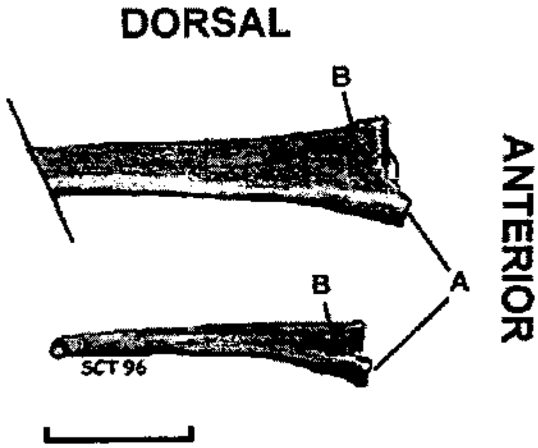


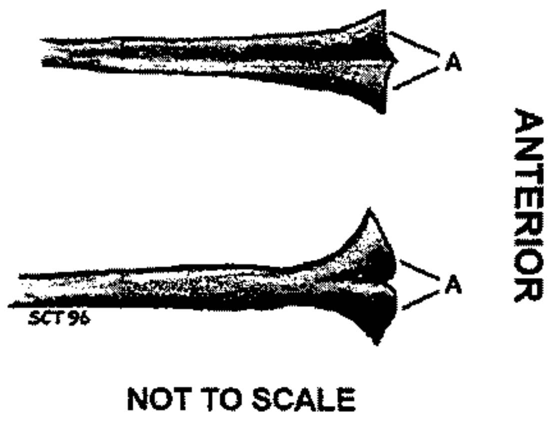
Figure 2. Urostyle, bullfrog (top) and American toad, anterior end, lateral aspect of rt side. Scale = 10 mm.



The Urostyle (Fig. 2 and 3)

The urostyle is a distinctive, elongated spear point-shaped bone formed from two or more fused caudal vertebrae (Romer 1970:161). At the anterior end are a pair of round or oval articular facets (Figs. 2 and 3, point A). In the frog, these form the anterior end of a double tube-like body which gradually constricts posteriorly into a single tube-like structure. (In the bullfrog the bifurcated appearance persists further towards the posterior end than in the leopard frog.) In toads, the double tube structure merges immediately posterior of the paired anterior facets into a single tube-like body, giving the anterior end a characteristic flared appearance. From the ventral perspective, in frogs the area between the paired articular facets comes to a point; in toads this area is notched (Fig. 3). From a lateral perspective, a fin-like buttressing crest arises from the dorsal surface of the urostyle (Fig. 2, point B). In toads, this crest is set back from the anterior end more than it is in frogs. Also, the toad urostyle has more ventral curvature.

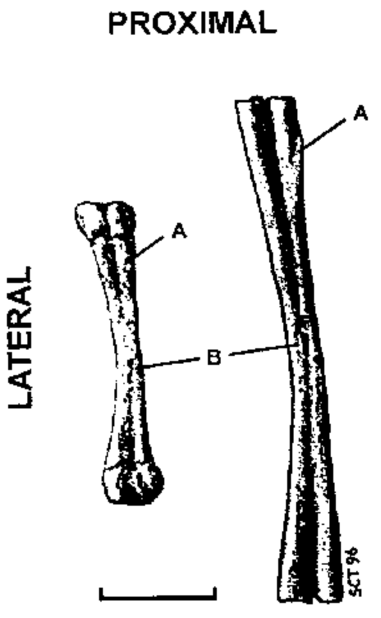
Figure 3. Urostyle, bullfrog (top) and American toad, anterior end, ventral aspect. Not drawn to scale.



The Tibiofibula (Fig. 4)

Side the frog tibiofibula by locating the tibial crest, a longitudinal ridge on the medio-anterior surface of the tibial shaft (Fig. 4, point A). The projecting ridge-like tibial crest gives the medial surface of the proximal frog tibiofibula a flattened appearance. In toads the tibial crest is more subtle and difficult to locate. Fortunately, the tibiofibula can be sided without reference to the tibial crest. First, orient the bone by identifying the anterior or cranial surface and the proximal end. Note the groove between the tibia and fibular components of this element. In both genera this groove is deeper on the anterior surface at the proximal and distal ends. Next, the proximal and distal ends can be identified by noting the path of the central foramen (Fig. 4, point B). This small but distinct structure penetrates the bone on an angle so that the opening on the posterior or caudal surface is proximal to that on the anterior surface. With the anterior surface and proximal end identified,

Figure 4. Rt tibiofibula, American toad (left) and bullfrog, anterior or cranial aspect. Scale = 10 mm.



note that the bone curves towards the lateral side. This technique should work even if one end is missing. The most obvious difference between the tibiofibulae of frogs and toads is that in the frog the tibiofibula is long and gracile while in the toad it is shorter and more robust. This contrasting morphology may reflect the saltatorial (jumping) adaptation of the frog as opposed to the fossorial (digging) adaptation of the toad. In Figure 5, the length and proximal width measurements for bullfrog and leopard frog are plotted together with measurements from the American toad and Fowler's toad. (All dimensions were measured to the nearest tenth of a millimetre with dial callipers.) Although more data is needed to demonstrate the strength of these relationships, the data at hand suggest that a significant, systematic difference exists between the two genera. Figure 6 displays the length to distal width measurements for the same specimens. Again, these preliminary data do not define but suggest a significant difference between the genera *Rana* and *Bufo* with respect to length to width ratios.

Figure 5. Shaft length & proximal width measurements for tibiofibulae from species in the genera Rana and Bufo. Broken lines indicate approximate trends in length:width ratios.

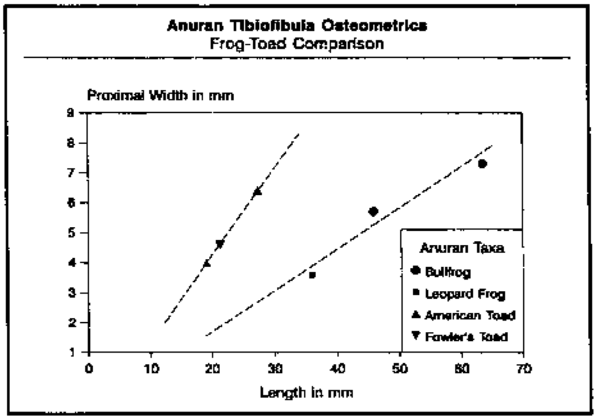
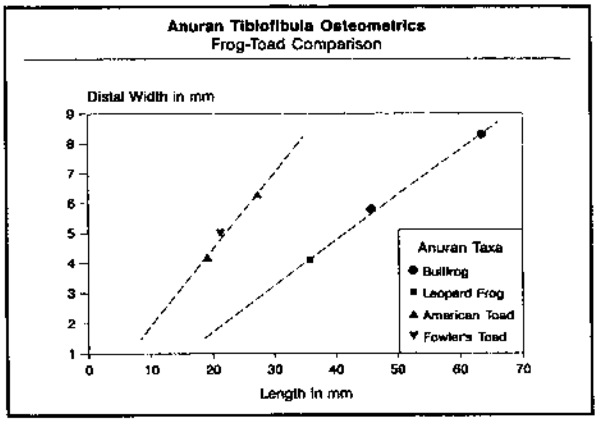


Figure 6. Shaft length & distal width measurements for tibiofibulae from species in the general Rana & Bufo. Broken lines indicate approximate trends in length:width ratios.



Discussion

Assuming that a substantial difference exists between tibiofibular length to width ratios in *Rana* and *Bufo*, we should be able to determine the genus of an unknown anuran specimen by comparing its measurements with those of identified anuran specimens. Here, I attempt a preliminary comparison using a population of archaeologically derived tibiofibulae from the 1990 ASI excavation at the Hubbert site (BbGw-9). Hubbert is a Middle Ontario Iroquoian village site located southwest of Lake Simcoe, occupied during late fourteenth century. Anurans account for 37 specimens, or 6% of the 618 identified unworked elements in the subsistence assemblage. Two bullfrog bones were identified. The remaining 35, derived from five features and two midden squares, were identified as "anuran, cf. *Rana*", probably in the wood frog size range or somewhat larger. Among these were 13 measurable tibiofibulae derived from three features and one midden square (Thomas 1995). Figures 7 and 8 show measurements for these specimens plotted against the trend lines for frog and toad osteometrics illustrated in Figures 5 and 6. The cluster of Hubbert metrics is intersected by the *Rana* trend line, which is consistent with the tentative identification based on morphology.

From the perspective of general dietary contribution, the anuran component of the Hubbert assemblage was not particularly significant. It is, however, of interest from the perspective of certain other aspects of the assemblage. The data indicate that much procurement activity was directed towards small terrestrial mammals, particularly lagomorphs and sciurids which comprise 69.1% of the unworked mammal assemblage (n = 236). In sharp contrast, white-tailed deer (*Odocoileus virginianus*) accounts for 0.8% of the unworked mammal assemblage. The MNI value for anurans is at least 10 (Thomas 1995). This, and the NISP frequency, suggest a modest but significant level of procurement activity directed towards anurans. The exploitation of frogs, species close to the extreme "gatherable" end of the faunal procurement behaviour continuum, fits neatly into the context of a subsistence system which also emphasized locally available, small-sized mammals which could be opportunistically trapped or snared very close to the village site.

Figure 7. A homogeneous population of anuran tibiofibulae from the Hubbert Site overlaid on trend lines representing length:proximal width ratios of tibiofibulae from Rana and Bufo.

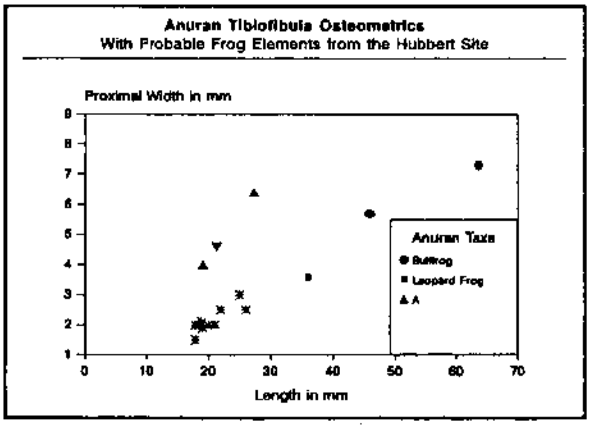
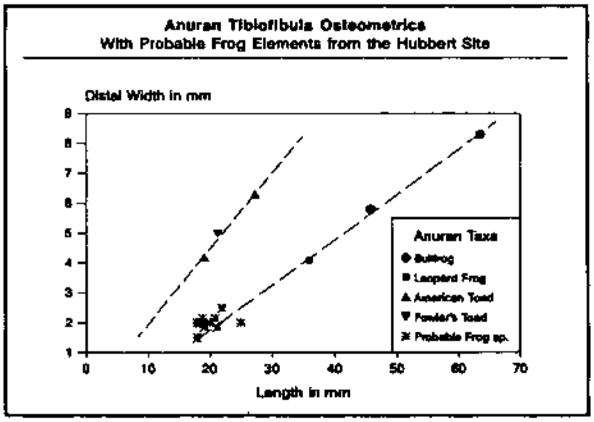


Figure 8. A homogeneous population of anuran tibiofibulae from the Hubbert Site overlaid on trend lines representing length:distal width ratios of tibiofibulae from Rana and Bufo.



Acknowledgements

I would like to thank Dr. Ronald F. Williamson of Archaeological Services Inc. who supported the zooarchaeological analysis of Hubbert, and who provided technical support for this paper; Dr. Howard G. Savage of the Anthropology Department of the University of Toronto for technical advice and access to the comparative zooarchaeological laboratory at the University of Toronto; and Mr. Ross MacCullough of the Royal Ontario Museum's Centre for Biodiversity & Conservation Biology, for information on anuran behaviour and access to the ROM amphibian osteology collection. I especially wish to acknowledge Mr. Andrew Allan, the computer graphics expert at Archaeological Cartography Illustration, who digitized my pencil sketches and prepared them for publication.

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SUMMER FIELD/LAB REPORTS:

Following are reports of what 3 zooarchaeologists did over the summer in the field or lab. We welcome short reports on zooarchaeological fieldwork or lab reports.

CRIMEAN FAUNAL PROGRAMME

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Introduction:

In 1994, a team of faunal analysts was assembled with the goal of working towards a regional interpretation of the Late Pleistocene palaeoenvironment and human resource use in the Crimea during the Middle Palaeolithic. After a few adjustments to the original membership, the team comprises Dr. Anastasia Markova, Constantin Michaelesku, Marylene Patou-Mathis, and myself. This team is currently investigating faunal patterning at three sites in the Western Crimea: Starosel'e, Kabazi II and Kabazi V. We eventually hope to broaden this research to include sites from the Eastern Crimea, as well as additional Western Crimean sites.

I spent one month in the field last season, with two graduate students from the University of Manitoba (Kate Peach and Valary McKinley). We lived in expedition tents in a large field, on the outskirts of a tiny village near Simferopol (the capital of the Crimea). A Ukrainian crew of about twenty, including three colleagues and archaeology students from the Kiev region, worked and lived with us at Kabazi camp. We spent the summer sorting a huge faunal assemblage from the Mousterian site of Kabazi II, and sorting and identifying a smaller assemblage from the previous year's excavations at Starosel'e. The crew divided into two groups to excavate Kabazi II, a large open-air site, and Kabazi V, a collapsed rock-shelter. Next summer I will return alone to set up the next research cycle.

Goals:

Team members will contribute to some or all of the following goals: establishing site chronology; identifying local and regional climate patterns; building a picture of regional biogeographic zonation; establishing patterns of hominid resource use through time; identifying archaeological site function and the potential role each site played in a regional settlement pattern. Faunal remains have been described previously from some Mousterian sites in the Crimea. Most of this earlier work was palaeontological in focus, however.

By expanding archaeozoological research in the Crimea, we hope to foster meaningful intra-, and inter-regional comparison, in particular with the Western Caucasus and the Central Russian Plain, where other teams (Baryshnikov and Hoffecker) are currently conducting zooarchaeological research on Mousterian occupation levels. These inter-regional comparisons may eventually help trace the origins of the Crimean Mousterian. Mousterian occupation of the Crimea has been traced by various authors to either the Lower Palaeolithic of the Caucasus (Bibikov 1971); to the Prodnic and Micoquian of the Ukraine and Russian plain (Gladilin 1985); or to local Lower Palaeolithic populations (Kolosov 1988).

Specific questions fauna may help answer:

There are four distinct industrial complexes in the Crimea (Chabai et al., 1995). Two of these are apparently restricted to the current study region: namely, the Western Crimean Mousterian, and Staroselian industries (Kolosov 1988; Chabai et al., 1995.). Kabazi V contains Staroselian industries only, as do levels 1,2 and possibly level 4 of Starosel'e. Starosel'e 3, however, is as yet unattributed. At Kabazi II, the Staroselian alternates with the Western Mousterian industry. Faunal patterning from these alternating occupations may help us understand the patterning in the lithic industries. E.g., could different resource-use patterns be correlated with changes in the tool industry - or, is there a seasonal pattern, detectable in the fauna, to the succession of tool complexes?

Malacological and microfaunal analyses are under way. Markova has established microfaunal species lists for each of the sites, but has not yet interpreted the environmental implications. Mikaelescu is still studying the malacofauna. Faunal remains from Kabazi V have been identified by Dr. Crabtree and myself, (N=3834). The faunal assemblage II-9 at Kabazi II have been partially analyzed. All four of the Starosel'e levels have been partially identified (N=2406). It is obviously premature to draw any conclusions from research in progress.... but some trends in the faunal assemblages have become apparent, which allow us to partially address the goals mentioned above.

Introduction to sites:

Each of the three sites currently being studied contains multiple in situ Mousterian occupation levels. The sites are located on slope deposits along river valleys in the foothills of the second Crimean range. Kabazi II and V are located along the Alma river valley, Starosel'e is situated in the Kanly-Dere valley, which branches off the Bakhchisaraiskaya Valley and ends in a box canyon. All of the sites lie below or within sight of limestone cliffs, overhangs or actual caves. As such, the sites possess a degree of locational similarity. However, while Kabazi II and Starosel'e are open air locales, Kabazi V was a rockshelter at the time of the earliest Mousterian occupations. This has patterned the faunal remains.

In particular, contrasts between the three sites, and between distinct levels, or units, within the three sites can already be drawn. The site excavators have suggested models for site use in each case, as well as a model for a Western Mousterian settlement system. The trends observed in the faunal remains may already be used to evaluate these models.

Chabai et al (1995) propose two distinct Mousterian settlement patterns for the Crimea. They suggest a model for the Western Crimean Mousterian occupations based on a pattern of high mobility. Kabazi II would fit into this model as a seasonal hunting station. Level 4 at Starosel'e may be similarly orientated towards episodic, seasonal exploitation of *Equus hydruntinus*. The top three levels of Starosel'e may present us with a different case, however: either longer term occupations, or short term occupations with a more generalised pattern of resource use. Kabazi V, a Staroselian occupation, looks more like a base camp, from which a number of hunting stands or kill-sites, perhaps similar to nearby Kabazi II, could have been exploited.

Further analysis of the taphonomy and seasonal indicators at these three sites should help refine a model for the regional settlement of the Western Crimea. Final analysis of the microfauna and malacofauna will provide more detailed environmental reconstructions, which in turn will enable us to test possible explanations for the differences in faunal patterning observed.

Although this research is only in it's infancy, we feel that it is already showing considerable promise. Although our goals as a team are numerous and probably quite ambitious, the assemblages which have been made available to us for this research have a lot of potential for broadening our understanding of the Mousterian occupation of the Crimea.

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ZOOLOGICAL REPORT FROM KONISPOL CAVE, ALBANIA

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The first joint Albanian-American collaborative project in Albania began in the summer of 1991, and has been ongoing until this summer (1996). The archaeological project was under the directorship of Dr. Karl Petruso (University of Texas at Arlington) and Dr. Muzafer Korkuti (Archaeological Institute in Tirana, Albania). Funding for the project was received by the National Endowment for the Humanities and from the Institute for Aegean Prehistory.

The Konispol Cave research is a multi-disciplinary project involving specialists of different disciplines including analysis of artifacts, macrofauna, microfauna, flora, as well as geophysical and geographical research. Recent work from Konispol Cave has demonstrated for the first time a Mesolithic occurence at an Albanian archaeological site. A Mesolithic-Neolithic transition has been identified in several archaeological excavation units and occurs between ca. 7,900 and 7,600 BP (Denton and Karlem 1973; Ellwood et al. 1996).

The Konispol Cave site is located on Mt. Sarakinoros near the town of Konispol in the district of Sarande, the southernmost administrative province of Albania. The cave is a constituent of the Saraqint limestone ridge and rises at an elevation of 400 + m.a.s.l. Its southwest entrance, overlooking the Pavel River Valley and the Strait of Corfu, act as a natural shield from the cold north winds. Overall measurements for the cave are approximately 50 m long, 6 m maximum depth, and 6 m maximum height.

Zooarchaeological evidence included both macro fauna and micro fauna. The objectives of my research were to identify and interpret the small faunal remains recovered from Konispol Cave using both traditional and taphonomic analytical approaches. By examining accumulations and modifications of bones a more accurate signature of a particular predator can be identified (Andrews 1990). The most likely predator responsible for the bone accumulation at Konispol seemed to be nocturnal owls.

Three forms of analysis were used in the attempt to identify the possible owl or owls. These included skeletal element proportion, breakage patterns and degree of digestion on cranial and postcranial elements. Of the three forms of analysis mentioned, the latter is by far the most accurate (Andrews 1990).

A total of 6013 partial and complete bones were analyzed. Of these, 4052 bones were identifiable and 1961 were indeterminate. The following trenches were excavated during the 1992-1994 season; Trenchs VIII, IX, X, XII, and XXI. Trench XXI is characterized by enormous concentrations of microfauna representing more than 85% of all small faunal elements collected at the cave. The breakdown of Konispol's microfauna is as follows: 55 Cricetidae; 30% Muridae; 13 Chiroptera and 5% Testudinata (see Table 1). Trench XXI is by far the most important trench in the cave for microfauna and has the highest bone count and is located directly beneath the breakaway window and the possible roost of owls.

Results from element proportion, breakage patterns, and degree of digestion suggest that the Barn Owl was the primary depositor of microfaunal remains in Konispol Cave. Element proportion is high and breakage patterns are typical of the Barn Owl which does not tear its prey but rather swallows it whole. Digestion and frequency of digestion is very light on cranial and postcranial elements.

A possible rival to the Barn Owl as a bone accumulator was the Long-eared Owl whose taphonomic effects closely resembles the Barn Owl. However, the Long-eared Owl prefers to roost in trees and as a rule does not use the same nest year after year (Andrews 1990:183). The accumulation of bones deposited in Trench XXI is the result of pellet accumulation over many years. The Barn Owl then seems to best represent the possible accumulator of the thick fossil deposit. Barn Owls are characterized by strong preferences for roosting and nesting places and use the same roost yearly therefore resulting in great pellet build-up (Andrews 1990:178).

Dr. Nerissa Russell (University of California, Berkely) was responsible for research conducted on the larger fauna from Konispol Cave. She has recorded a total of 18,273 bones so far. Of these, approximately 7478 are identifiable. Species present at Konispol include wild and domestic cattle, wild and domestic pigs, red deer, ibex, chamois, roe deer and a few probable fallow deer. Both domestic sheep and goats are present as well as a few carnivores: dogs, lynx, badger, marten and fox.

Large fauna was recovered from all five trenches. Faunal evidence for the Mesolithic is prominent in Trenches XXI, X, and IX. Trench XXI is largely wild with no definite domestics and include ibex and wild boar with few chamois remains in the lower levels. It is also the most intense in occupation. Dr. Frank Harrold (University of Texas at Arlington) has identified Trench XXI as the most dense in Mesolithic stone tools. Trench IX's Mesolithic occupation is mostly wild (red deer and wild boar) with a gradual transition towards domestics in the Neolithic. Trench X is marked by a longer Mesolithic occupation than Trench IX. Bone remains collected from this trench are very broken and would seem to indicate that the occupants of Konispol Cave were attempting to extract the most nutrients possible from the animal bones. Phalanges are severely broken and cracked much like the phalanges recovered from Trench XXI's Mesolithic units. Remains indicate a spring/ summer occupation.

The Mesolithic and Bronze Age in Trench XXI are characterized by very little bone and more carnivore remains. However, Trenches VIII, IX and X are richer than Trench XXI and include mostly neonate sheep/goat and very little wild fauna. Throughout the Mesolithic and Neolithic a re-occuring butchering pattern becomes apparent. Cut marks are for the most part concentrated on ribs and could signify a cultural continuity and a distinct butchering practice for the Konispol region.

From the macro- and micro-bone evidence it would appear that shepherds were occupying the cave for short periods of time during the lambing season from the Neolithic to the Bronze Age. Bones are being roasted rather than boiled probably due to the purpose of the site which consisted of temporary shelter. Pottery collected at the site is simplistic and crude and does not indicate a high presence of pots used for boiling.

In total, 25 bone tools were recovered. These included points and fishing tools made from antlers. The Neolithic points were made by splitting the bone numerous times and extracting as much raw material as possible. On the contrary, the Bronze Age points are more dichotomized and ornamental. Their finish is more polished and laborious.

This summer marks the last season for the project. Both Dr. Russell and I have spent the greater part of July recording the last of the large fauna. Thanks to Dr. Korkuti we were both able to have access to the material which is stored at the Archaeological Institute in Albania's capital of Tirana.

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Table 1. Small fauna present at Konispol Cave

Taxon	Hellenistic	Iron	Late BA	Early BA	Bronze Age
Pitymys thomasi		2	1	24	
Mus macedonius					
Mus sp.					
Apodemus sylvaticus					
Apodemus mystacinus					
Glis glis	1		2	13	1
Cricetulus migratorius				6	
Crocidura svaveolens			1	6	
Talpa europaea					
Testudinata		9	10	5	6
Reptilia			1	1	
Squamata	9	1	2	2	
Chiroptera	1	1	3	9	
Nisp	11	13	20	66	7

continued ----->

Table 1 (continued). Small fauna present at Konispol Cave

Taxon	Eneolithic	Late Neolithic	Middle Neolithic	Early Neolithic	Mesolithic
Pitymys thomasi	10	9		8	501
Mus macedonius					66
Mus sp.					5
Apodemus sylvaticus	1	1		2	25
Apodemus mystacinus		1			49
Glis glis	9	18	6	7	27
Cricetulus migratorius				1	32
Crocidura svaveolens				4	92
Talpa europaea					3
Testudinata	6	7		22	
Reptilia	1	6		1	20
Squamata				2	
Chiroptera	2	6		2	321
Nisp	29	49	6	49	1141

A Brief Summary of the Cervid Pit Found at the Watford Site (AlGu-5)

by Jeffrey Muir
Dept of Anthropology, Trent University, Peterborough, Ontario, K9J 7B8

In the summer of 1995, the London Museum of Archaeology conducted the salvage excavation of the Watford Site (AlGu-5) near Richmond Hill, Ontario. A Southern Division Huron settlement occupied sometime between 1450 and 1500 AD (Pearce 1995), the settlement consisted of six longhouses bounded by a palisade and one outside the palisade (Rost 1996). The longhouse outside the settlement contained a hearth and an infant burial; outside of the northwest corner of the house lay a pit containing cervid remains.

In the spring of 1996, this material was passed along to the author for examination and analysis. While the analysis has not yet been completed, a short preliminary summary is presented here due to the unusual nature of the collection.

Besides the bone, the pit contained a small pottery fragment and an unidentified carbonized plant remain, which is believed to be contemporaneous with the Huron settlement. While the site itself was excavated using salvage techniques, the pit was carefully excavated in five artifical layers over three weekends by a small crew. The crew took such care with the pit because there were many semi-articulated elements and many of them were very fragile.

When examined, the cervid bone was determined to be mostly wapiti with some additional white-tailed deer remains. Not all of the material, such as skull or rib fragments, have been completely examined. The NISP of the wapiti remains was 1575, while the MNI was 8, based on the number of complete specimens or overlapping fragments from the right mandible. The amount of white-tailed deer remains was considerably less with a NISP of 138 and a MNI of 2, based on the number of left hind cannon bone portions or left distal epiphyses of the humerus. For both the wapiti and white-tailed deer, all body portions are represented, but not necessarily from all animals. Not all of the bones have been assigned to specific individuals, so it is difficult to comment upon to what degree each animal is represented in the sample at this time.

None of this material was burnt nor was there any indication of human modification, such as cut marks. The only evidence of some form of human interference was the absence of assorted body parts. While the lack of elements such as hyoid cornua (only 4 wapiti hyoid fragments were found) can be attributed to preservation bias, the reduced number of more robust elements such as femora or tibiae (anywhere from 3 reconstructed wapiti left femora to 5 reconstructed wapiti right tibiae) may be due to human removal of the missing elements.

All of the wapiti remains appeared to be of the same age: one to two weeks old, based on their morphological similarity to specimen number 75109, a skeleton of a 16 kilogram one to two week old individual housed in the faunal comparative collection at the Canadian Museum of Nature (this information was kindly retrieved by Anne Rick). The white-tailed deer specimens are under two years old, but no age determination has yet been made. Since both wapiti and deer have their young in May or June (Kurta 1995), these animals were probably deposited in this pit in June or July. However, this is not definite at the moment as the white-tailed deer have not been properly aged.

With the analysis of the bones themselves nearing completion, the author and Robert Rost, a fellow graduate student at Trent University, are beginning to look at the reasons why these animals were deposited together in a pit. It seems rather unusual to find the remains of so many wapiti and deer deposited together with no apparent evidence of human modification other than the absence of assorted body parts. Is this deposit evidence of ritual use? Was it a meat cache? As the analysis near completion and interpretations begin, the questions will be addressed.

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Zooarchaeological Presentations in Honour of Dr. Howard Savage - Session at the CAA, Halifax, May 1996

Kathlyn Stewart and Jeffrey Muir***
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***Dept of Anthropology, Trent University, Peterborough, Ontario, K9J 7B8*

This session in honour of Dr. Howard Savage, organised by Frances Stewart, took place on Friday May 3 at the CAA meetings, Halifax. The session was preceded in the previous evening by tributes and a presentation to Howard at the Maritime Museum of the Atlantic. The Friday session started with a video taken and edited by Frances, which included interviews with Dr. Savage and described building up the H.G. Savage Osteology collection at the University of Toronto, as well as describing Dr. Savage's teaching and research from past to present.

The video was followed by 15 papers, all with a zooarchaeological focus but with a variety of perspectives, including methodology, site utilisation, zoogeography, procurement and processing strategies, subsistence strategies and taphonomy. While most papers discussed fauna from Canadian sites, 4 papers dealt with faunas from Greece, Albania, Scotland and Belize.

Jeffrey Muir started off with a paper discussing on-site utilisation and discard patterns of animals entitled "Faunal Findings at the Praying Mantis site (AfHi-178)". The Praying Mantis site is an Early Ontario Iroquois site in London, where over 20,000 faunal remains were recovered and identified. Muir was interested in documenting use and discard of faunal remains at Praying Mantis and comparing results with other Iroquoian sites. He was somewhat hindered by excavation methods, in that fauna was lost when the top soil was stripped off, as it was with only a 1/4 inch mesh screen used for screening bone. To date he has identified approximately 75% mammal remains and 10% fish and is using these results as a model of faunal use on Iroquoian sites.

Two papers on methodology followed. Maribeth Murray (with co-authors Lisa Rankin and Peter Ramsden) presented "The Cutting Edge: New Approaches to Sectioning for Seasonality", starting with a history of the use of tooth sectioning by wildlife biologists and a description of the technique, which in brief is looking at incremental growth rings in tooth cementum. The authors looked at conventional methods and the newer method using SEM. Preparation techniques of the teeth were described. The authors describe how the technique is being applied to interpret growth patterns in teeth from eastern Arctic and Ontario archaeological sites, although interpretation of seasonality is still in progress.

A second paper on methodology was presented by Suzanne Needs-Howarth and John M. Casselman, entitled "Assessing Age and Growth in Fish: Archaeological Applicability of Fisheries Methods". The authors outlined the methodology in using seasonal growth checks on fish calcified structures (e.g. scales, bones, spines) to determine age and growth patterns of fish, as well as possibly determining seasonality of death. The authors described the uses and problems of such methods for interpretation of archaeological bone, and discuss ongoing analysis on archaeological fish scales/bone from Iroquoian sites on Lake Simcoe.

The next 3 papers describe differing subsistence strategies in Northeastern sites. Bev Smith discussed subsistence strategies at Terminal Woodland and Early Historic sites along Lake Superior in her paper "Exchange Networks in Subsistence Reconstruction: A Case Study from the Upper Great Lakes". By describing and quantifying the animals found at each site, and calculating potential dietary need by site inhabitants, she was able to suggest that regional exchange networks existed between cultural groups, in order to obtain necessary subsistence items. She emphasised that subsistence systems cannot be viewed in isolation, but as part of regional networks, with active travelling and trade of goods.

Frances Stewart continued the theme of differing subsistence strategies with her paper "Zooarchaeological differences between the proto-Huron/Petuns and the Proto-St. Lawrence Iroquoians of Ontario". Fran described the recovery techniques (6 mm screen) and described the 2 sites of Keffer and McKeown. She quantified the fauna recovered from the sites, and used ethnohistoric data to help document differences in procurement and subsistence strategies, including differing availability and quality of food items at the 2 sites.

The subject of Iroquoian subsistence strategies is continued in Steve Thomas' paper on "Lacustrine salmonid exploitation at the Over site (AlGu-120), an Inland Late Iroquoian village near Toronto, Ontario". Thomas described the fish assemblage and in particular his methodology for analysis of salmonid vertebrae. His analysis of the Over site fish assemblage indicated that 2 strategies were employed in procuring fish: one based on fishing for local species, and the second focused on species at considerable distance from the site.

A zoogeographic perspective was given in Joanna Reading, David Black and Howard Savage's paper entitled "Extinct Sea Mink in the Quoddy Region, New Brunswick". The authors documented the presence of the somewhat controversial sea mink (*Mustela macrodon*) in a shell midden in coastal New Brunswick. The sea mink has been primarily documented from the Maine coast, and this marks the first evidence of its existence in Canada.

We move to the North for the next two papers. Max Friesen reported the contents of 3 caches of caribou recovered near Baker Lake, Nunavut, in his paper "Insights into Processes of Meat Storage and Transport Based on Three Abandoned Caches Near Baker Lake, Nunavut". He documented the skeletal element distribution and discusses butchery patterns and meat usage.

Murielle Nagy analysed three faunal assemblages from the Ivujivik region in her paper "Palaeoeskimo seal hunting strategies in Ivujivik (Nunavik, Northern Quebec)". She documented differing age-based hunting strategies in the pre-Dorset and Dorset periods. She further discussed seasonal differences in transport and storage of seal carcasses.

The next 2 papers looked at methodological considerations in interpreting diet in BC coastal sites. In the paper written by Aubrey Cannon, Henry Schwarz, and Martin Knyf, "Isotopic Confirmation of Subsistence Trends at Namu, British Columbia", the isotopic analysis of dog bones was used as one of many methods to investigate human dietary trends at Namu in British Columbia. The authors demonstrated how zooarchaeologists can reconstruct human diet not only by analysing the faunal remains of the food eaten but by analysis of other animal remains found at sites.

Kathlyn Stewart's paper, "Fauna from the Kosapsom Site, Vancouver Island: Results and Implications for Northwest Coast Faunal Recovery" noted a heavy reliance on fish, with mammals and birds also figuring in the diet. In addition, she presented an archaeological cautionary tale of sample size at coastal sites, noting the difference in microfaunal remains recovered over two seasons when the excavated soil was only selectively screened during the second field seaon.

The remaining papers of the day concerned sites outside of Canada, beginning with "Remains from a Middle Formative Midden at the Tolok Group, Cahal Pech, Belize: Implications for Preclassic Lowland Maya Animal Resource Utilization", written by Norbert Stanchley, Terry Powis, Jaime Awe, and Paul Healy (and read by Frances Stewart as the authors were unable to attend). A Middle

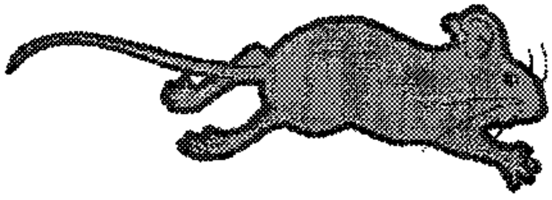
Formative period midden at the Tolok settlement group at Cahal Pech yielded over 5,000 bone and shell remains. While the majority of the faunal collection - consisting mainly of local resources, especially freshwater fish and shellfish - was used to identify the diet among the Tolok Maya, the exotic Caribbean marine fauna was used as an indicator of Preclassic Maya trade and exchange.

The next paper, presented by James Barrett and co-authored with Trevor Ringrose was entitled "Bone Weight Data and the Interpretation of Intra-Site and Inter-Site Economic Patterning: Theory and Practice". The authors first examined the correlation between dry bone weight and total weight of birds, fish and mammals. Then, using bone weight data from Viking and medieval sites in Northern Scotland, the authors illustrated how such data could be used to examine behavioural patterning within a site and between sites.

Taphonomic and micromammal studies at a cave site were the focus of Leola Leblanc's presentation "Small Mammal Taphonomy from the Konispol Cave Site, Albania". By examining the micro-mammal remains from the Konispol cave site in Albania, she was able to discover the predator that accumulated the bones in this cave site, and comment upon how and when these bones were accumulated during the site's sporadic human occupation. Her paper served to demonstrate how taphonomic and faunal analyses of micro-mammal remains could contribute to the understanding of European cave sites.

Finally, Deborah Ruscillo presented the last paper, "Burning Patroclus: Marine Remains from Cremation Burials in Early Iron Age Torone, Greece", a contribution to marine remains analysis methodology. She was investigating why marine shells and stones were found among cremated human remains from the Protogeometric period at the site of Torone. Using the Homeric description of a funeral where Patroclus was cremated on a funeral pyre, Deborah was able to determine that the collections of waterworn pebbles and shells found among the cremated remains could have come from similar funerals using seaside funeral pyres.

The session came to an end when Dr. Savage spoke to the audience, sharing his views on the range of papers presented. He also emphasized how important it was for faunal analysts not only to continue to look at zooarchaeological collections, but to continue with building their own comparative collections which he felt would greatly aid zooarchaeologists in their understanding of archaeological animal remains.



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Forthcoming Conferences / Conférences à Venir

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REQUESTS/EXCHANGES/ NOTICES
DEMANDES, ECHANGES, AVIS

•Michael Miller, a grad student at the University of Saskatchewan studying modern raptors, is interested in hearing of any archaeological finds of bald eagle or osprey. He would also like to obtain references to these birds in ethnographic sources. Contact him at the University of Saskatchewan by phone: (306) 966-5001, fax: (306) 966-4461 or email: millerm@sask.usask.ca

• A zooarchaeologist and zoologist working on Lake Sturgeon would like to hear from anyone who has identified *Acipenser* sp. pectoral spines (first ossified fin rays) from archaeological sites. Contact Suzanne Needs-Howarth: Tel. 416-652-9099;
email: 75304.2724@compuserve.com

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