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THE FAUNAL REMAINS FROM FOUR LATE IRON AGE SITES IN THE SOUTPANSBERG REGION: PART I: TAVHATSHENA*

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ABSTRACT

The faunal remains from four Late Iron Age sites in the Soutpansberg area are described in three parts, according to the settlement patterns ascribed to them by Loubser (1988). Part I describes the remains from Tavhatshena, a Central Cattle Pattern settlement with dates that range from the 11th to 16th centuries. The majority of the fauna comes from the latter half of this range. Cattle predominate, sheep/goats contribute a small amount and a wide variety of wild species are identified from the excavations. Cattle present a wide range of ages but mature animals are not in the majority for all units. Butchering practices and pathologies are also described. Skeletal part representations and distributions are then considered on an intra-site level, to assess whether the evidence is sufficient to delineate activity areas/disposal patterns, despite non-involvement in research and sampling designs and in the actual excavations.

INTRODUCTION

A recent archaeological project by Loubser (1988, 1991) on the Iron Age of the Soutpansberg region investigated the origins of the Venda people, their history, traditions, political economy, and relationship with the Shona of Zimbabwe and the Sotho-Tswana of the northern Transvaal. Chronologies based on ceramics from these sites helped to clarify conflicting interpretations in the literature. Tavhatshena, one of the ealiest sites excavated by Loubser, is a Central Cattle Pattern settlement. The trenches were excavated near the residence of the headman. The dates obtained range from the 11th to the 16th century. The faunal remains, however, were not studied at the time.

Considering that the Soutpansberg samples were not principally selected for faunal research, often a problem when samples are presented to the archaeozoologist after excavation, it is not clear whether their limitations can produce meaningful intra- and inter-site results. Based on my analyses of the faunal remains from this and other sites (De Wet 1993), the presence of activity areas, cattle size variation and herd management strategies were explored. For present purposes, however, the aim is to describe the faunal remains from Tavhatshena and to assess the presence of activity areas/disposal behaviour at this site.

METHODS

Bones were identified using the Transvaal Museum skeletal collections and a wide variety of publications were consulted (*e.g.* Du Plessis 1969; Baker & Brothwell 1980; Smithers 1983; Meester *et al.* 1986; Iscan & Kennedy 1989). Sheep and goats were distinguished where possible with the aid of the collections and other studies (Boessneck *et al.* 1964). Little information exists however concerning local sheep and goat post-cranial skeletal anatomy. Unidentifiable fragments were sorted, then counted, weighed and where appropriate measured.

An awareness of taphonomic processes is crucial to interpretation (Gilbert & Singer 1984) particularly when assessing potential human activity areas. A large number of studies on taphonomy were examined, such as those pertaining to butchering and carnivore modification, natural attrition *vs.* humans as taphonomic agents (Gilbert & Singer 1984; Nicholson 1992), bone densities and rates of bone survival (Brain 1967; Lyman 1984, 1985, 1992; Livingstone 1989; Marean 1992). Unfortunately identification of all possible natural and anthropogenic biases was not possible.

I used several different quantification techniques for different purposes. The number of identified skeletal parts or fragments (NISP) is the basic enumeration unit. Considering the inherent weaknesses of the MNI (minimum number of individuals) method (Casteel 1977a, & b; Binford 1978; Klein & Cruz-Uribe 1984; Grayson 1984; Plug & Plug 1990; De Wet 1993) it was used mainly to determine age profiles, as they represent absolute numbers of individuals in each age class based on tooth eruption and wear data. To give a fuller view of the age profiles, post-cranial remains were also calculated into the MNI counts when necessary.

Because of the limitations of the MNI method, a more recent method, QSP (quantifiable skeletal parts), was used to make taxa comparable in order to assess relative animal abundances, contributions of meat to diet, skeletal abundance and the relative preservation of skeletal parts.

Briefly, the QSP method is a technique whereby the varying skeletal complexity between species or animal classes is corrected thus making different species or taxa comparable (Gilbert *et al.* 1981). This is done by dividing the number of skeletal parts retrieved by the skeletal parts in the living animal worth quantifying (Plug 1988; De Wet 1993). The bones worth quantifying are referred to as 'quantifiable skeletal parts'. The resulting value is a proportion of abundance for that species.

This value can then be compared to the values derived from other taxa. Differences between taxa thus represent differences in relative abundance, not skeletal complexity. QSP counts also illustrate in a more realistic manner a taxon's relative contribution of meat since QSP values, multiplied by the meat mass of different species, provides proportional representations between species and not the calculation of meat from whole individuals. To compare the inaccuracies of the MNI method in calculating meat contributions to diet, I used it against the QSP method.

Another factor in estimating meat contributions is those species or animal groups ascribed to the 'non-contributor' category. These animals are considered not part of the human diet (Plug 1988), and confirmation of these is based on Venda and Shona ethnographic data (Stayt 1931; Gelfand 1971).

QSP counts can also be used to estimate relative skeletal abundance and the relative preservation of skeletal parts. By carefully recording each fragment's position on its respective skeletal element (Dobney & Rielly 1988) and correcting for skeletal complexity, and fragments become reconstituted into complete skeletal elements. This method is not an exercise in establishing numbers of individuals, but it can establish which parts of a skeletal element, or which elements or parts of the carcase were deposited or preserved and their frequency. This makes it possible to see whether assemblages are due to preservational bias and/or human activity. Some of the cattle remains from Tavhatshena are relatively numerous to warrant using this method to examine skeletal part representations.

TAVHATSHENA 2329 BB2A

Loubser (1991:170) notes several central cattle pattern settlements similar to Tavhatshena in the Soutpansberg area. Generally the lower part of the settlement is the front, the cattle byre is the centre, and behind the byre, or between byres, serves as the public assembly, or court. Behind this, there usually exists a slightly terraced platform on which the village or family head resides. His wives live on both sides, forming an arc of residential units around the byre. These central cattle pattern settlements span several centuries north and south of the Soutpansberg.

Tavhatshena is located south of the Soutpansberg range in the south-eastern corner of the Ben Lavin Nature Reserve (23.09.04S; 29.58.10E) (Fig. 1). The central dung concentration is surrounded by several mounds containing wall daga, small stones, and ash (Loubser 1991:194). In terms of political hierarchy Tavhatshena is a Level 2 site, and so the headman probably did not control more than a 20 km radius around the settlement. The pottery styles and the dates obtained at Tavhatshena show that this settlement was inhabited before and during the contact between Sotho and Shona speakers in the mid 15th to 16th centuries. The settlement therefore precedes the late 17th century Zimbabwe Singo expansion into the area.

Loubser excavated three trenches (Fig. 2), with Trench 1 (12 m^2) placed over a peripheral mound on the settlement's eastern side, Trench 2 (2 m^2) placed just west of Trench 1 and Trench 3 (2 m^2) on a disturbed ash and daga mound on the northern side of the site near to the probable residence of the headman. Trench 1 is a series of hut floors and burials with a dung concentration on the lowest level. Trench 3 has no features and is mainly a disturbed ash and daga mound. The trenches therefore appear to have been placed in the domestic areas of this settlement.

The taphonomic history of Trench 1 is complex, and the activities of aardvark and springhare exacerbate the problem. Despite this, Loubser established three ceramic components for Trenches 1 and 3. The faunal remains were analysed per square meter unit and then combined according to the ceramic components listed in Table 1. Table 2 lists the species and animal size classes in each level of all trenches.

TOTAL FAUNAL SAMPLE

The excavations yielded a total bone sample of 6 835 pieces with a mass of 51 455,3 g (Table 3). The lowest level of Trench 1 (T1/6) consisted only of a fragment of a child's mandible. Included in the total sample are 48 fragments of a human skeleton from the lower component of Trench 1. These fragments were not identified during the initial sorting and are probably the remains of one of the two skeletons recovered. Trench 2 has few bone fragments, and these are probably related to the Mixed Moloko component.

MEAT CONTRIBUTIONS

The majority of the identifiable remains are cattle in both trenches and therefore cattle meat predominates in contributions to diet both in QSP and MNI percentages (Tables 4-7). Buffalo (Bov IV) remains in T3/3, Moloko component, sharply decrease the cattle meat yields based on MNI, but using QSP values, the contribution of buffalo meat is low (Table 5).

Sheep/goat remains are identified but their overall contributions to diet is low. The sheep/goats contribute little in the earlier component although a slightly higher percentage occurs in Trench 3. This is also the case for the Mixed Moloko component in both trenches.

Trench 1 has a wider variety of non-domestic animals

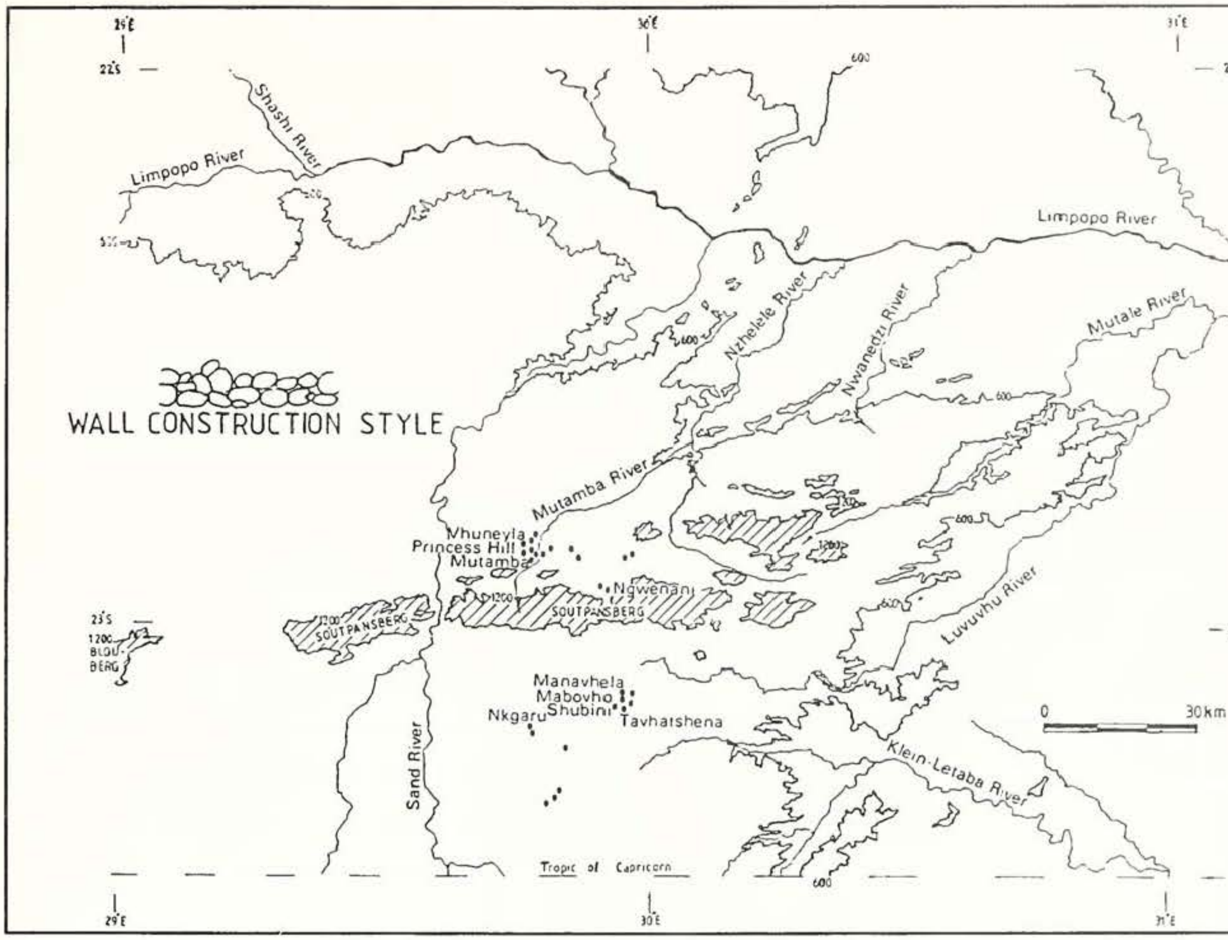

Fig. 1. Distribution of Cental Cattle Pattern settlements in the Soutpansberg region.

than Trench 3, and at face value it could be assumed that cattle meat was more often consumed in this area or that the remains were deposited here in preference over other remains. With the lack of broader horizontal excavations this difference may be due to trench size, rather than to spatial activities or preferences in meat consumption.

Non-domestic animals were also consumed but their numbers are not great. In the Moloko component of T1/4-5, (and to a lesser extent the Mixed Moloko component) the large number of non-contributors suggest that some of these may well have been hunted, but their contribution to diet is unknown as many have social and ritual significance, especially felids, canids, viverrids and primates (Stayt 1931:47). Some or all may have been traded, but the skeletal elements are not restricted to extremities as they would be if the skins were important (Welbourne 1975:8). Conversely, the lack of phalanges in the samples suggest that the skins (usually with the phalanges contained in the skin) may have been traded out for other items of use or importance.

AGE DISTRIBUTION

Based on MNI counts from teeth, mature (Thorp's classes IV-V) cattle predominate except in the Moloko component in Trench 1 where the number of immature (Thorp's classes I-III) cattle is slightly greater than mature (Table 8). Teeth recovered from T3/3 are all from adult cattle, but post-cranial fragments also represent juvenile and sub-adult animals. Reapplying the age classes to include the post-cranial remains increases the number of immature cattle. It is unfortunate that the cattle MNI count is low for both components in T3 and thus further comparisons between the two trenches are not feasible.

For sheep/goats, adults predominate with a few sub-adults present in the Moloko component of one trench and in the Mixed Moloko component of both trenches. In T3/3, there are more neonates present than adults. For this age class, only cranial and teeth fragments were recovered. It is doubtful if these very young animals were actually consumed, but the numbers are low and difficult to interpret: 11 neonatal to 14 adult fragments in NISP terms. Although the ratio is high, these remains may have been created by a one-off event, such as still births.

SEXUAL IDENTIFICATION

All sexually identifiable cattle material, mainly horncore and innominate fragments, come from Trench 1 of both components: two females from the Moloko component, and two males, one female and a probable ox from the Mixed Moloko component. Others include the

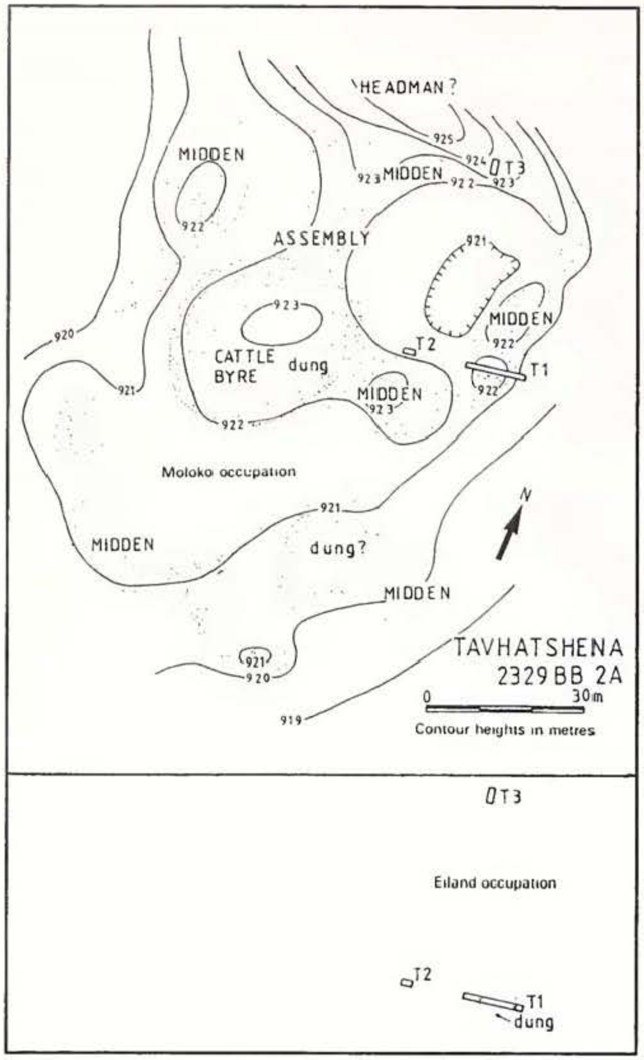

Fig. 2. The settlement layout of Tavhatshena: postulated layout during the Eiland occupation (bottom) and during the Moloko occupation (top).

tarso-metatarsus of a male francolin in the Moloko component; from the Mixed Moloko component, a female sheep/goat innominate fragment, and a tarso-metatarsus of a female domestic chicken or guinea fowl.

SKELETAL PART PRESERVATION, TAPHONOMY AND DAMAGE

In Trench 1, the general quality and preserved state of the bones is mixed, this in part due to the disturbed context. In the lower component, several bones have evidence of black speckling. This is likely due to manganese in the soil (Plug pers. comm.). The amount of weathering is relatively low which should make identification easier but this is partially negated by the cementation of soil and ash on some of the bones.

In both trenches most of the bones are unmodified, but some butchering practices can be noted. Cut marks on some cattle astragali, carpals, tarsals and phalanges run parallel to the articulation surfaces, indicating dismemberment at the joints. Longitudinal splitting occurs mainly on metacarpals, metatarsals and phalanges, and in the later component, occasionally on tibiae and femora, indicating marrow extraction. This is a common damage pattern on many of the Soutpansberg samples. Carnivore gnaw marks are present on many of the cattle fragments. Although no dog remains were identified, these marks may be indirect evidence of their presence at this settlement. Rodent burrowing activity is confirmed from the gnaw marks present on some of the bones from the later component. The other species and bovid size classes also have butchering damage, but the numbers are few.

Table 1. Tavhatshena: Stratigraphic levels of the ceramic components and calibrated dates.

Ceramic component		Trench 1	Trench 2	Trench 3
Mixed Moloko				
	Level	1	1	1
		2		2
		3	AD 1580 ± 80 (WITS-1549)	
Moloko				
				3 AD 1290 ± 80 (WITS-1453)
		4		
		5		
Eiland				
		6	AD 1050 ± 110 (WITS-1437)	

Vertebrae show various butchering practices with the majority being the removal of the dorsal spine only. In the Moloko Component more vertebrae are sheared through the body along the dorsal-ventral axis and few others through the cranio-caudal axis. This is the reverse in the Mixed Moloko component. Since the other butchering processes are relatively similar, this difference between components may be due to idiosyncratic preferences. More excavations in other areas are needed to determine butchering and allocation patterns.

The level of bone fragmentation is not always dictated by the butchering process. Post-depositional processes such as trampling or compacting are likely causes for creating smaller fragments in the later component. The high level of fragmentation in T2 is most likely also due to heavy trampling and repeated sweeping.

Little remains show any evidence of burning. No non-domestic animal remains show this damage. The majority of burnt or heat-exposed bone are mainly longbone flakes. In T3/3 Moloko component, more ribs are burnt.

PATHOLOGY

In the Moloko component, the distal tibia of a non-domestic Bov II is deformed: the articulation of the lateral malleolus had not formed properly. In the Mixed Moloko component various pathologies occur, mainly

Table 2. Tavhatshena: list of species/size classes per level.

Species or Size class	T1/1	T1/2	T1/3	T1/4	T1/5	T2	T3/1	T3/2	T3/3A	T3/3B
Bos taurus cattle	+	+	+	+	+	+	+	+	+	+
Ovis aries sheep	+	+	+	+				+		
Capra hircus goat	+	+	+	+	+					
Sheep/goat	+	+	+	+	+		+	+	+	+
Homo sapiens sapiens human				+	+					
Cercopithecus aethiops vervet		+								
Canis mesomelas black-backed jackal			+	+						
Cynictis penicillata yellow mongoose				+						
Galerella sanguinea slender mongoose				+						
Viverrid			+							
Felis lybica African wild cat				+						
Medium felid			+							
Large felid	+									
Loxodonta africana elephant	+	+	+	+						
Equus burchelli Burchell's zebra	+	+								
Potamochoerus porcus bushpig	+									
Suid	+									
Connochaetes taurinus blue wildebeest				+						
Alcelaphus sp. hartebeest	+									
Alcelaphine	+									
Cephalophus natalensis red duiker	+			+						
Cephalophus sp.				+						
Sylvicapra grimmia grey duiker	+	+	+	+			+		+	+
Raphicerus campestris steenbuck	+			+						
Aepyceros melampus impala	+									
Pelea capreolus grey rhebuck		+								
Hippotragus equinus roan	+									
Hippotragus sp.		+								
Syncerus caffer buffalo	+	+							+	
Tragelaphus angasii nyala	+									
Tragelaphus scriptus bushbuck		+								
Redunca fulvorufula mtn. reedbuck	+									
Rattus rattus rat				+	+					
Lepus saxatilis scrub hare			+	+						
Francolinus swainsonii Swainson's francolin					+					
Francolinus sp.				+						
Gallus/Numida sp. chicken/ guinea fowl	+			+						
Bov. I	+	+	+	+			+		+	
Bov. II non-domestic	+		+	+						
Bov. II	+	+	+	+	+		+	+	+	+
Bov. III non-domestic	+	+	+	+						
Bov. III	+	+	+	+	+		+	+	+	
Tortoise				+						
Achatina sp. terrestrial gastropod	+	+	+	+	+		+		+	+
Unio sp. freshwater bivalve				+						
Tropidophora sp. freshwater bivalve				+						

exostosis, on cattle and sheep/goat phalanges. Other pathologies include a cattle molar with signs of growth problems. All three lobes have a series of dents on one side near the junction of the root and crown. The tuber scapulae on a cattle shoulder blade is elongated in the medial direction as well as lipping on the glenoid. Animal bone pathologies are not often recognised or noted in analyses.

SKELETAL PART REPRESENTATION AND DISTRIBUTION

The non-identifiable fragments in both trenches and components show that skull and vertebrae are uncommon and rib fragments are generally more numerous except in the later component of Trench 1 where there are more miscellaneous fragments.

Table 3. Tavhatshena: total bone sample.

Skeletal part	T1/1-3	%	T1/4-5	%	T2/1	%
Bovid remains	942	21,7	403	22,7	5	35,7
Other remains	53	1,2	104	5,8	-	-
Total identifiable	995	23,0	507	28,5	5	35,7
Enamel fragments	37	0,8	4	0,2	-	-
Skull fragments	406	9,4	151	8,5	-	-
Vertebra fragments	346	8,0	145	8,1	-	-
Rib fragments	804	18,5	403	22,6	-	-
Misc. fragments	1050	24,2	288	16,2	-	-
Bone flakes	694	16,0	282	15,8	9	64,3
Total non-identifiable	3337	77,0	1273	71,5	9	64,3
TOTAL SAMPLE	4332	100,0	1780	100,0	4	100,0
Mass (g) identifiable	19539,1	62,6	7841,0	55,7	22,4	44,4
Mass (g) non-ident.	22697,1	37,4	6240,8	44,3	28,1	55,6
TOTAL MASS (g)	31236,2	100,0	14081,8	100,0	50,5	100,0
% of sample burnt		1,5		2,8		-
% of sample identifiable		23,0		28,5		55,6
Median length of bone flake (mm)	32		38		29	

Skeletal part	T3/1-2	%	T3/3	%	TOTAL T1-3	%
Bovid remains	61	17,4	82	22,8	1493	21,8
Other remains	1	0,3	7	1,9	165	2,4
Total identifiable	62	17,7	89	24,7	1658	24,2
Enamel fragments	6	1,7	-	-	47	0,7
Skull fragments	21	6,0	12	3,3	590	8,6
Vertebra fragments	37	10,6	31	8,6	559	8,2
Rib fragments	107	30,6	119	33,1	1433	21,0
Miscellaneous fragments	59	16,8	66	18,4	1463	21,4
Bone flakes	58	16,6	42	11,7	1085	15,9
Total non-identifiable	288	82,3	270	75,2	5177	75,8
TOTAL SAMPLE	350	100,0	359	100,0	6835	100,0
Mass (g) identifiable	1685,1	54,2	1318,4	44,3	30406,0	59,1
Mass (g) non-ident.	1426,1	45,8	1657,0	55,7	21049,3	40,9
TOTAL MASS (g)	3111,2	100,0	2975,4	100,0	51455,3	100,0
% of sample burnt		2,3		3,3		2,0
% of sample identifiable		17,7		28,4		24,2
Median length of bone flake (mm)*	39		42		36	

* Median average calculated for TOTAL.

The higher count for rib fragments in general may illustrate the portions of the carcass more frequently consumed. Alternatively, it may reflect a segment of society who consumed this portion more than others. On the other hand, ribs are the most numerous skeletal elements in a living animal and also fragment relatively easily. Their high count could therefore be due to social, anatomical and attritional factors. The difference in the

Table 4. Tavhatshena T1/4-5: Moloko: meat contributions.

Species		QSP	QSP value	QSP %meat	MNI	MNI %meat
Herding						
Bos taurus	adult	176	1,080	87,57	12	76,7
	juv.	26	,164	5,28	3	7,6
Sheep/goat	adult	37	,227	1,17	3	1,2
	juv.	9	,057	,23	1	,3
TOTAL HERDED		248	1,528	94,25	19	85,8
Hunting: Bovids						
Bov. I	adult	11	,067	,19	4	,8
	juv	1	,006	,01	1	,2
Bov. II non-dom.		1	,006	,04	1	,6
Bov. III non-dom.	adult	4	,024	,78	1	2,6
	juv	1	,006	,12	1	1,5
TOTAL HUNTED:BOVIDS		18	,109	1,14	8	5,7
Indeterminate bovids						
Bov. II	adult	18	,110	,57	2	,8
	juv	1	,006	,02	1	,3
Bov. III	adult	17	,104	3,73	2	5,7
	juv	2	,012	,26	1	1,7
TOTAL INDET BOVIDS		38	,232	4,58	6	8,5
Snaring						
Lepus saxatilis		1	,007	<,01	1	<,1
Bird		5	,100	,03	3	<,1
TOTAL SNARED		6	,107	,03	4	<,1
Gathering						
Tortoise		1	,011	<,01	1	<,1
Achatina sp.		2	1,000	<,01	1	<,1
TOTAL GATHERED		3	1,011	<,01	3	<,1
TOTAL FOOD ANIMALS		313	2,987		40	
Non-contributor						
Homo sapiens sapiens		19			1	
Canis mesomelas		1			1	
Cynictis penicillata		1			1	
Galerella sanguinea		5			1	
Felis lybica		2			1	
Loxodonta africana		1			1	
Rattus rattus		19			2	
Tropidophora sp.		1			1	
Unio sp.		1			1	

upper component between Trench 1 and 3 may therefore be seen as evidence for differential consumption between residential units, or any of the other factors just noted.

The higher count of miscellaneous fragments in T1/1-3 is also difficult to interpret. These fragments include some or all skeletal parts. Taphonomic processes, from chemical to trampling, may have created this higher count. Overall the totals for the rib, miscellaneous and longbone categories are not too dissimilar, and therefore preferential consumption cannot be demonstrated. Cranial fragments are fragile, and I may have identified them as miscellaneous pieces. The low numbers of identified cranial fragments, however, may illustrate that animal heads were not often consumed or disposed of in these areas.

With regard to the identifiables, using the cattle NISP counts and QSP to correct for skeletal complexity, it is

Table 5. Tavhatshena T3/3: Moloko: Meat contributions.

Species		QSP	QSP value	QSP %meat	MNI	MNI %meat
Herding						
Bos taurus	adult	35	,215	86,09	5	65,1
	juv	4	,025	3,99	1	5,2
Sheep/goat	adult	12	,074	1,90	1	,8
	juv	9	,057	1,17	2	1,3
TOTAL HERDED		60	,371	93,15	9	72,4
Hunting						
Bov. I		3	,018	,29	1	,5
Bov. IV		1	,006	3,76	1	20,4
HUNTED		4	,024	4,05	2	20,9
Indeterminate bovids						
Bov. II		4	,025	,64	1	,8
Bov. III		2	,012	2,12	1	5,8
TOTAL INDET.		6	,037	2,76	2	6,6
Gathering						
Achatina sp.		2	1,000	,03	1	<,01
TOTAL GATHERED		2	1,000	,03	1	<,01
TOTAL FOOD ANIMALS		72	1,432		14	

possible to derive post-cranial cattle skeletal element representations. There are a few instances of under- and over-representations of cattle elements for some of the units of the two components, but the QSP counts may be too low to make reasonable interpretations.

One instance where the QSP count is large and worth consideration is in the Mixed Moloko levels of T1/1-3. Adult cattle post-cranial remains represent most skeletal elements according to NISP figures (Table 9). According to reconstituted whole elements, however, the distribution shows a different pattern (Fig. 3). There is a greater representation of cattle hindlimbs than forelimbs. Tibia and calcaneus fragments make up more than eight 'individuals'. Although the representation of cattle scapulae is lower, Bov III has an over-representation of these. Scapulae are seldom complete and difficult to identify to species level; it may therefore be assumed that some of these bones are from cattle. If these scapulae are added to the *Bos* figure, scapulae would then be on par with the over-representation of tibiae and calcanei.

Almost all the small elements are underrepresented relative to the longbones. There are also no small elements identified as Bov III in this unit which may have come from cattle. No patellae were recovered but this is not an uncommon phenomenon. These elements are soft and spongy, and are often eaten by dogs and susceptible to natural attrition (Plug, pers. comm.). In relation to the major limbbones, there are few phalanges which suggests that they may have remained in the hides after skinning.

Differences in skeletal part representations must, however, be weighed against bone density in creating over- and under-representations. Lyman's (1992) bone density values (Table 10) were compared to the cattle skeletal element representations at Tavhatshena. Comparing the over-representations to the density values,

Table 6. Tavhatshena T1/1-3: Mixed Moloko: Meat contributions.

Species	QSP	QSP value	QSP %meat	MNI	MNI %meat
Herding					
Bos taurus adult	518	3,178	92,40	23	73,3
juv.	24	,151	1,74	3	3,8
Sheep/goat+ adult	71	,436	,82	5	1,0
juv.	7	,044	,07	2	,3
TOTAL HERDED	620	3,809	95,02	33	78,4
Hunting: Bovids					
Bov. I	21	,129	,14	4	,3
Bov. II non-dom adult	12	,073	,14	5	1,0
juv	2	,012	,01	1	,1
Bov. III non-dom adult	23	,140	1,57	5	5,7
juv	2	,013	,08	1	,6
Bov. IV	4	,024	1,09	1	5,0
TOTAL HUNTED: BOVIDS	64	,391	3,03	17	12,7
Indeterminate bovids					
Bov. II adult	24	,147	,27	3	,6
juv	1	,006	,01	1	,1
Bov III adult	17	,104	1,34	3	4,2
juv	1	,006	,05	1	,8
TOTAL INDET. BOVIDS	43	,263	1,67	8	5,7
Hunting: Non-bovids					
Equus burchelli	2	,013	,24	1	2,0
Suid	2	,008	,03	2	,8
TOTAL HUNTING: NON-BOV	4	,021	,27	3	2,8
Snaring					
Lepus saxatilis	4	,029	<,01	1	<,1
Bird	1	,020	<,01	1	<,1
TOTAL SNARED	5	,049	<,01	2	<,1
Gathering					
Achatina sp.	2	1,000	<,01	1	<,1
TOTAL GATHERED	2	1,000	<,01	1	<,1
TOTAL FOOD ANIMALS	738	5,533		65	
Non-contributor					
Cercopithecus aethiops	1			1	
Canis mesomelas	1			1	
Viverrid	1			1	
Large felid	1			1	
Medium felid	1			1	
Loxodonta africana	5			1	

\+ Ovis aries and Capra hircus subsumed under sheep/goat with MNI adjusted.

the results are fairly well correlated. Calcanei, tibiae and metapodials have very high densities and are well represented. On the other hand, scapulae, have a good representation but are less dense. Scapulae fracture easily, however, and yet remain easily recognised, so these two factors could have caused the bias. The densities of other elements do not always correlate with bone density values, however, and natural attrition may not be the only factor involved. Cooking procedures affect bone as heat and water cause changes in surface area to volume ratio. Micro-organisms take advantage of this change and penetrate bone, breaking down its structure from within (Nicholson 1992).

Once natural attrition processes, such as bone densities and survival are assessed, human activities can be evaluated. Along with this, archaeological finds and

Table 7. Tavhatshena T3/1-2: Mixed Moloko: Meat contributions.

Species	QSP	QSP value	QSP %meat	MNI	MNI %meat
Herding					
Bos taurus adult	39	,239	91,68	4	71,7
juv	2	,013	1,99	1	7,1
Sheep/goat	9	,055	1,35	3	3,5
TOTAL HERDED	50	,307	95,02	8	82,3
Hunting: Bovids					
Bov. I	3	,018	,27	1	,7
TOTAL HUNTED	3	,018	,27	1	,7
Indeterminate bovids					
Bov. II	3	,018	,45	1	1,2
Bov. III	4	,025	4,24	2	15,8
TOTAL INDET.	7	,043	4,69	3	17,0
Gathering					
Achatina sp.	1	,500	,02	1	<,01
TOTAL GATHERED	1	,500	,02	1	<,01
TOTAL FOOD ANIMALS	61	,388		13	

Table 8. Tavhatshena: Ages of *Bos taurus* and sheep/goats based on tooth eruption and wear. Numbers listed are MNI.

	Age classes		MNI			
			Moloko		Mixed Mol.	
	Voigt (1983)	Thorp (1984)	T1/ 4-5	T3/ 3*	T/ 1-3	T3/ 1-2
Bos taurus	I	I	1	0	0	1
	II	I	1	0	1	0
	III	II	1	0	2	0
	IV	III	3	0	6	1
	V	III	2	0	2	0
	VI	IV	1	0	3	0
	VII	IV	2	2	5	1
	VIII	IV	2	1	5	2
	IX	V	2	1	2	0
			15	4	26	5

* Including post-cranial remains: juv = 1; sub-adult = 1; adult = 4.

Sheep/goat	I		0	2	1	
	II		1	0	1	
	III		0	0	0	
	IV		1	0	2	
	V		2	1	2	
	VI		0	0	1	
			4	3	7	

N.B. T3/1-2 = no teeth; post-cranial remains: sub-adult = 1; adult = 2.

Table 9. Tavhatshena T1/1-3: Mixed Moloko: Number of skeletal parts. (P: primate, C: carnivore, E: elephant, EQ:zebra, S: suid, H: hare, B: bird, SH: shell, nd: non-domestic, d: domestic).

Skeletal part	P	C	E	EQ	S	Bov I	Bov II nd	Bov II d	Bov II	Bov III nd	Bov III d	Bov III	Bov IV	HA	B	SH	TOTAL
Horncore											25	2					27
Cranial						2		9	4	1	70	4		1			91
Hyoid									1		3						4
Atlas											4						4
Axis											5						5
Scapula						3	5	1	6	5	25	9					54
Humerus					2		1	5	7	4	25	2					46
Radius		1				7	2	12	6	5	24	3					60
Ulna								1	1	1	9		1				13
Carpal										1	9		1				11
Metacarpal						1	1	1	2	2	45						52
Pelvis		1		1		2	1	3	1	4	43	1					57
Sacrum											1						1
Femur		2				3	2	1	6	2	47	1					64
Tibia						1	1	5	5	7	56	7					82
Astragalus							1				12						13
Calcaneus							1	2	1		22		1				27
Tarsal											8						8
Metatarsal							1	3		3	34						41
Metapodial											5	1					6
Phalanx 1				1				3			26						30
2								1			22						23
3											16		1				17
Sesamoid										1	2						3
Vertebra											4						4
Other	1														1	33	35
Total	1	4		2	2	21	14	47	40	36	542	30	4	1	1	33	778
Teeth			5			1	2	44			161			4			217
TOTAL	1	4	5	2	2	22	16	91	40	36	703	30	4	5	1	33	995

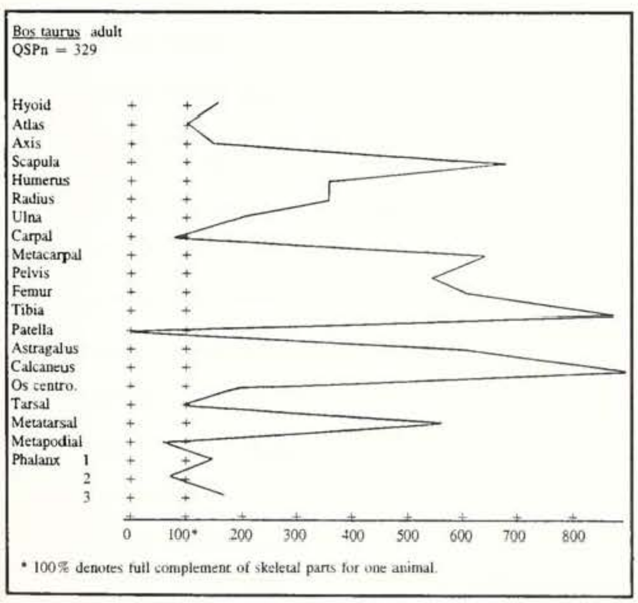

Fig. 3. Tavhatshena T1/1-3: Mixed Moloko: Percentages of post-cranial remains represented after correction for skeletal complexity.

the presence or absence of non-domestic, socially significant animals must be considered. Correlating specific human activities with excavated remains is a daunting task. Not only are natural taphonomic processes to be considered, but most ethnographic studies including those on the Venda (Stayt 1931; Van Warmelo 1932; Van der Waal 1977, 1979) seldom include observations on the production and disposal of refuse. More recently ethnographers and ethnoarchaeologists are beginning to look at refuse and the prescribed locations for refuse disposal (Maggs *et al.* 1987: Mack *et al.* 1991). This aspect of ethnoarchaeological research needs greater attention. Despite these limitations, the Tavhatshena evidence can provide some interesting evidence alluding to activities concerning headmen and diviners.

I could not establish the horizontal distribution of the iron and ceramic finds, but I could note the distribution of ivory, worked bone and the remains of 'non-contibutor' animals. Most of these finds and remains were located at the western end of Trench 1 in Levels 1-4 and include felids of differing sizes, mongoose, primate and jackal remains. Although the levels belong to two

Table 10. Bone density values for skeletal parts ranked highest to lowest. (Based on Lyman, 1992).

Skeletal Part	Bone Density (gm/cm³)
Calcaneus	,64
Mandible	,57
Metacarpus, proximal	,56
Metatarsus, proximal	,55
Tibia, distal	,50
Metacarpus, distal	,49
Astragalus	,47
Metatarsus, distal	,46
Ulna, distal	,44
Radius, distal	,43
Radius, proximal	,42
Phalanx 1	,42
Rib	,40
Humerus, distal	,39
Naviculo-cuboid (os centro.)	,39
Scapula	,36
Femur, proximal	,36
Ulna, proximal	,30
Tibia, proximal	,30
Lumbar	,29
Femur, distal	,28
Innominate	,27
Phalanx 2	,25
Phalanx 3	,25
Thoracic	,24
Humerus, proximal	,23
Sternum	,22
Cervical	,19
Axis	,16
Atlas	,13
Skull	no data
Carpals	no data

separate components it is possible that some mixing occurred. The association of these bones with ivory bracelets seem unusual, unless they are associated with a leader or diviner.

In Trench 3, ivory was also retrieved along with a Bov I tibia shaft, smoothed and bored at one end. This shaft is similar to those found by Thorp at Khami Hill (Thorp 1984), a Zimbabwe culture capital of the 15th century. It is believed that these were carried on necklaces by diviners. The animals associated with diviners at Khami Hill are similar to those retrieved in the western sector of Trench 1. Although the pendant and the wild species were not retrieved from the same trench, it does not preclude the idea that this area of this Central Cattle Pattern settlement was associated with diviner or headman activities. I include the latter because these animals can also be associated with the leader of a settlement. More research needs to be done on Central Cattle Pattern settlement layout, and exploring and defining activity areas and disposal patterns for these types of sites.

CONCLUSIONS

Tavhatshena has provided much information regarding the Late Iron Age of the Soutpansberg. Its faunal samples have limitations, however. The difficulties in presenting data from one site is exacerbated by the fact that archaeozoologists are not often involved in the research and sampling designs of the archaeologist. As a result, the data may become merely descriptive, particularly on the intra-site level.

Generally, it could be stated that at Tavhatshena, cattle were important and herding probably took precedence over other procurement activities, this being based on the remains of only two trenches.

When considering the ages of the cattle and sheep/goats, the imbalance between sample sizes of Trench 1 and 3, makes comparisons and interpretation difficult, especially since it appears that there were more immature cattle in T1 than in T3. Is this evidence for differential consumption and/or disposal patterns, or sampling bias?

There is some evidence for a different butchering pattern between the two components, but this is mainly descriptive; and its significance cannot be established with small samples. The sex of animals can become an important factor in cattle slaughter and mortality patterns, however, again the small size of the samples does not provide any meaningful information, for this site alone.

Pathologies of animals are also important and although they may not be fruitfully interpreted on the intra-site level at the present time, they can be examined for trends. Once aetiologies are known, however, pathologies may reveal information on culling practices, over-crowded byres, the terrain, general health and nutrition and the treatment of draught animals at a settlement.

Assessing the distribution of skeletal fragments is important in activity area research. Here, natural, animal, and human factors need to be constantly played against each other to fruitfully interpret the presence or absence of activity areas at an Iron Age site. Although these limited samples provide some information on intra-site activities, it needs to be expanded.

Ultimately, for sites such as this Central Cattle Pattern settlement to provide substantive information, and generate new interpretations and explanations, there is the need for developing questions that can be tested through excavations. The excavations themselves need to be re-assessed. There is a need for broader, horizontal excavations. This is of course not recommended for every site but it will establish keys to understanding the layout, and activity areas of other Iron Age sites, where only several trenches are planned. Along with this, ethnographies need to be thoroughtly examined, and new research needs to be conducted on the remaining traditional societies in southern Africa. Finally, theoretical bases need to be created before excavations proceed, because at this point, many archaeozoologists are asking questions after analysis, and not before the excavations are carried out.

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REFERENCES

Baker, J. & Brothwell, D. 1980. Animal diseases in archaeology. London: Academic Press.

Binford, L.R. 1978. Nunamiut ethnoarchaeology. New York: Academic Press.

Boessneck, J., Meuller, H.H. & Teichert, M. 1964. Osteologische Unterscheidungsmerkmale zwischen Schaf (*Ovis aries* Linne) und Zeige (*Capra hircus* Linne). Keuhn-Archiv, Band 78. Berlin: Akademie Verlag.

Brain, C.K. 1967. Hottentot food remains and their bearing on the interpretation of fossil bone assemblages. Scientific Papers of the Namib Research Station 32 (6):1-11.

Casteel, R.W. 1977a. A consideration of the behaviour of the MNI index: a problem in faunal characterization. OSSA. 3/4:141-151.

Casteel, R.W. 1977b. Characterization of faunal assemblages and the MNI determined from paired elements: continuing problems in archaeology. Journal of Archaeological Science 4:125-134.

De Wet, E. 1993. Methodological considerations of Late Iron Age Fauna from the Soutpansberg. Unpublished M.A. thesis: University of the Witwatersrand.

Dobney, K. & Rielly, K. 1988. A method for recording archaeological animal bones: the use of diagnostic zones. Circaea 5(2):79-96.

Du Plessis, S.F. 1969. The past and present distribution of the *Perissodactyla* and *Artiodactyla* in southern Africa. M.Sc. thesis: University of Pretoria.

Gelfand, M. 1971. Diet and tradition in an African culture. Edinburgh: Livingstone.

Gilbert, A.S. & Singer, B.H. 1982. Reassessing zooarchaeological quantification. World Archaeology 14:21-41.

Gilbert, A.S., Singer, B.H. & Perkins, D. 1981. Quantification experiments on computer-simulated faunal collections. OSSA 8:79-94.

Grayson, D.K. 1984. Quantitative zooarchaeology. London: Academic Press.

Iscan, M.Y. & Kennedy, K.A.R. 1989 (eds). Reconstruction of life from the skeleton. New York: Alan R. Liss.

Kent, S. 1987. Understanding the use of space: an ethnoarchaeological approach. In Kent, S. (ed.) Method and theory for activity area research: an ethnoarchaeological approach: 1-60. New York: Columbia University Press.

Klein, R.G. & Cruz-Uribe, K. 1984. The analysis of animal bones from archaeolgical sites. Chicago: University of Chicago Press.

Livingston, S.D. 1989. The taphonomic interpretation of avian skeletal part frequencies. Journal of Archaeological Science 16:537-547.

Loubser, J.H.N. 1988. Archaeological contributions of Venda ethnohistory. Unpublished Ph.D. thesis: University of the Witwatersrand.

Loubser, J.H.N. 1991. The ethnoarchaeology of Venda speakers in southern Africa. Navorsinge van die Nasionale Museum Bloemfontein. 7(8):146-464.

Lyman, R.L. 1984. Bone density and differential survivorship of fossil classes. Journal of Anthropological Archaeology 3:259-299.

Lyman, R.L. 1985. Bone frequencies: differential transport, *in situ* destruction, and the MGUI. Journal of Archaeological Science 12:221-236.

Lyman, R.L. 1992. Anatomical considerations of utility curves in zooarchaeology. Journal of Archaeological Science 19:7-22.

Mack, K., Maggs, T. & Oswald, D. 1991. Homesteads in two rural Zulu communities: an ethnoarchaeological investigation. Natal Museum Journal of Humanities 3:79-129.

Maggs, T., Oswald, D., Hall, M. & Ruther, H. 1986. Spatial parameters of Late Iron Age settlements in the Upper Thukela Valley. Annals of the Natal Museum 27(2):455-479.

Marean, C.W. 1992. Measuring the post-depositional destruction of bone in archaeological assemblages. Journal of Archaeological Science 18:677-694.

Meester, W., Rautenbach, I.L. & Dippenaar, N.J. 1986. Classification of southern African mammals. Pretoria: Transvaal Museum.

Nicholson, R.A. 1992. An assessment of the value of bone density measurements to archaeoichthyiological studies. International Journal of Osteoarchaeology 2:139-154.

Plug, I. 1988. Hunters and herders: an archaeozoological study of some prehistoric communities in the Kruger National Park. Doctoral thesis: University of Pretoria.

Plug, C. and Plug, I. 1990. MNI counts as estimates of species abundance. South African Archaeological Bulletin 45:53-57.

Smithers, R.H.N. 1983. The Mammals of the Southern African Subregion. Pretoria: University of Pretoria.

Stayt, H.A. 1931. The Bavenda. London: Oxford University Press.

Thorp, C. 1984. Faunal Remains as Evidence of Social Stratification at Great Zimbabwe. Unpublished M.A. thesis: University of the Witwatersrand.

Van der Waal, C.S. 1977. Die Woning en Woonwyse Onder die Venda. Unpublished M.A. thesis: University of Pretoria.

Van der Waal, C.S. 1979. Woonwyse van die Venda. South African Journal of Ethnology 2 (1):11-27.

Voigt, E.A. 1983. Mapungubwe: an archaeozoological interpretation of an Iron Age Community. Pretoria: Transvaal Museum.

Welbourne, R.G. 1975. Tautswe Iron Age site: its yield of bones. Botswana Notes and Records 7: 1-16.