CATTLE SIZE VARIATION DURING THE LATE IRON AGE OF THE SOUTPANSBERG REGION, SOUTH AFRICA

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Summary

The cattle bones from three late Iron Age sites in the Soutpansberg provide probable evidence for a chronological variation in cattle size. These animals appear to have become larger from the earlier to more recent sites. The sites examined are Tavhatshena, Dzata and Tshirululuni. To show the chronological variation in size, 809 measurements were taken on cattle skeletal elements from these sites. These were compared to measurements taken on the modern comparative collections housed in the Department of Archaeozoology at the Transvaal Museum. Specific elements and dimensions were then selected based on sample size. The results of the measurements suggest an increase in size of cattle over time. In all instances, Tavhatshena cattle are relatively smaller, while Dzata cattle show wide variations in size, whereas Tshirululuni cattle elements are more robust. Several suggestions are presented for this change in cattle size.

Résumé

Variation de taille des bovins à la fin de l'Âge du Fer dans le Soutpansberg, Afrique du Sud.

Les restes de bovins de trois sites de la fin de l'Âge du Fer dans le Soutpansberg mettent en évidence une probable variation chronologique de la taille des animaux. Il semble que cette dernière augmente des sites les plus anciens aux sites les plus récents. Les sites étudiés sont Tavhatshena, Dzata et Tshirululuni. Pour montrer la variation chronologique de taille, 809 mesures ont été prises sur les restes osseux des bovins de ces sites. Ces mesures ont été comparées avec celles prises sur une collection de comparaison actuelle du Département d'Archéozoologie du Muséum du Transvaal. Certains éléments et dimensions ont ensuite été sélectionnés selon la taille de l'échantillon. Dans tous les cas, les bovins de Tavhatshena sont relativement petits, alors que ceux de Dzata montrent une grande variation de taille, et ceux de Tshirululuni sont plus robustes. Plusieurs suggestions sont présentées pour expliquer ce changement de taille des bovins.

Zusammenfassung

Die Größenvariation von Rindern während der Späten Eisenzeit der Region Soutspansberg, Südafrika.

Die Rinderknochen dreier späteisenzeitlicher Siedlungen in Soutpansberg belegen chronologisch bedingte Größenunterschiede. Die Tiere scheinen mit der Zeit größer zu werden. Die untersuchten Siedlungen heißen Tavhatshena, Dzata und Tshirululuni. Um die Größenunterschiede zu belegen, wurden an Skelettelementen aus diesen Siedlungen 809 Maße aufgenommen. Diese wurden mit rezenten Maßen aus der Vergleichssammlung des Department of Archaeozoology am Museum von Transvaal verglichen. Einige Elemente und Maße wurden gegenübergestellt. Das Ergebnis belegt eine Größenzunahme im Laufe der Zeit. In allen Bereichen erscheinen die Rinder von Tavhatshena kleiner, die aus Dzata weisen eine größere Variationsbreite auf und die aus Tshirululuni sind robuster. Für die belegte Größenzunahme werden einige Erklärungsansätze geboten.

Key Words

Southern Africa, Soutpansberg, Late Iron Age, Cattle, Size variation, Environment.

Mots clés

Afrique du Sud, Soutpansberg, Fin de l'Âge du Fer, Bovin, Variation de taille, Environnement.

Schlüsselworte

Südafrika, Soutpansberg, Späte Eisenzeit, Rind, Größenvariation, Umwelt.

Introduction

Until recently, there has been relatively little work conducted on cattle size variation in the southern African Iron Age. Voigt (1983) attempted to size Mapungubwe cattle and compared them to the evidence from other sites, namely Zambian Iron Age and Saharian Neolithic sites. Her results were inconclusive as she was restricted to whole bone and this presented a very small sample. Other than this study, there is very little else in the literature.

The variation in cattle size was examined from the bones from several Late Iron Age sites in the northern Transvaal. These sites are Tavhatshena, Dzata, and Tshirululuni (de Wet, 1993) (fig.1). In comparison to the modern southern African cattle collection housed at the Transvaal

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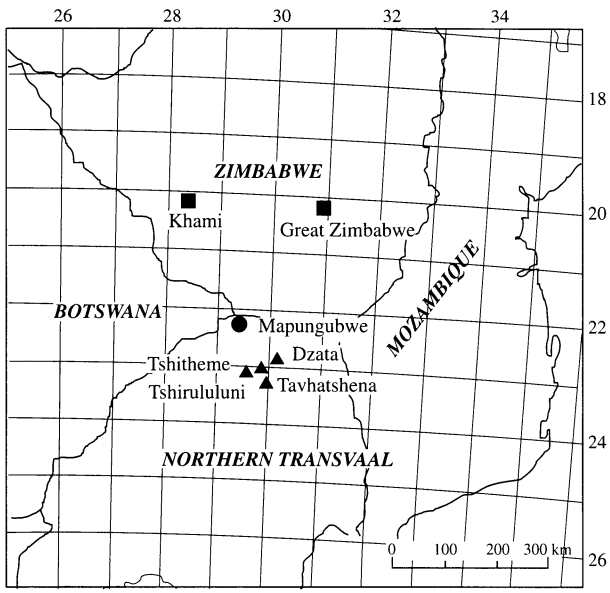

Fig. 1: Distribution of the Soutpansberg Late Iron Age sites (triangles).

Museum, some bones from Tavhatshena appear relatively smaller, and from Tshirululuni, more robust. The question that needed answering is: do these cattle from the sites represent natural variation or are other factors involved?

To place the bones in their archaeological context (Loubser, 1988, 1991), Tavhatshena dates to between the 11th and 16th centuries and was a commoner settlement. The position of headman was the highest status held here. Dzata was established in the late 17th century and was the famous capital of the royal Singo empire. The Singo controlled the political and economic power in the northern Transvaal-Soutpansberg area during the 17th and 18th centuries. The Singo was directly related to the Shona royals in southern Zimbabwe, the latter being the group who founded Great Zimbabwe in the 12th to 15th centuries. Tshirululuni was occupied slightly later by the Singo and their Lemba allies, and was an important regional centre after the end of the Singo control.

According to the dates available, and those levels that contain the most bone, Tavhatshena and Tshirululuni are roughly 250 years apart. The remains from Dzata are earlier than those from Tshirululuni (fig. 2).

Methods and results

To establish the variation in cattle size, 809 measurements were taken of the adult remains from these sites. The only fragments selected are those that are unmodified by carnivore, rodent, human or other agents. These were compared to the 808 measurements of adult cattle material from the comparative collections in the Transvaal Museum (tab. 1). The ages of these individuals are three years old or older at death, and they are predominantly Nguni or Pedi cattle.

The skeletal elements eventually selected for analysis are those that occurred in reasonable numbers archaeologically; namely the naviculo-cuboid (or *os centroquartale*), the astragalus (or talus), and the first and second phalanges. Only those dimensions that are the most numerous for each element are selected: greatest breadth on the *os centroquartale,* the greatest lateral and medial lengths on the talus, and the distal breadths of the first and second phalanges (fig. 3).

These measurements were initially plotted separately according to their trench and levels. Eventually the points were combined within each site as these showed little dimensional difference. These measurements were then compared to the modern comparative collection (fig. 4). The sample of Friesian cattle, which are an improved type, stand out quite significantly.

Regarding these plots, it can be noted that the number of points is not large for a specific aspect of a skeletal element. When performing osteomorphological and osteometrical comparisons between similar elements, 15 specimens are usually sufficient to clearly show repetitive patterns in size and morphology (Peters, 1988; Plug and de Wet, 1991; Plug and Peters, 1991). The Soutpansberg samples cannot match this requirement except perhaps for the phalanges. The numbers however are sufficient for statistical testing to assess whether the plots represent a significant pattern or are due to chance. For present purposes however, statistical tests were not conducted.

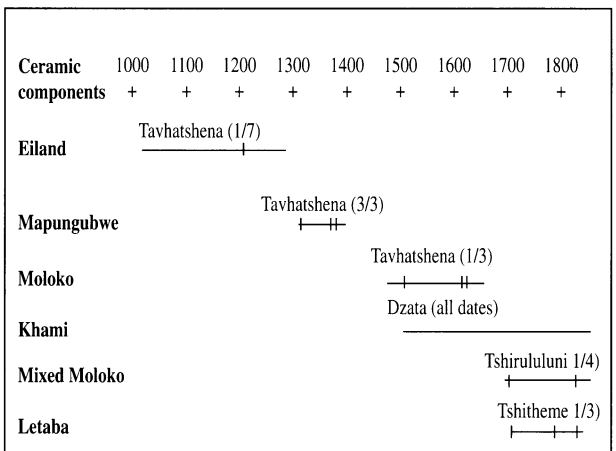

Fig. 2: Calibrated radiocarbon dates from four Soutpansberg sites. Trench number and level are presented in parentheses.

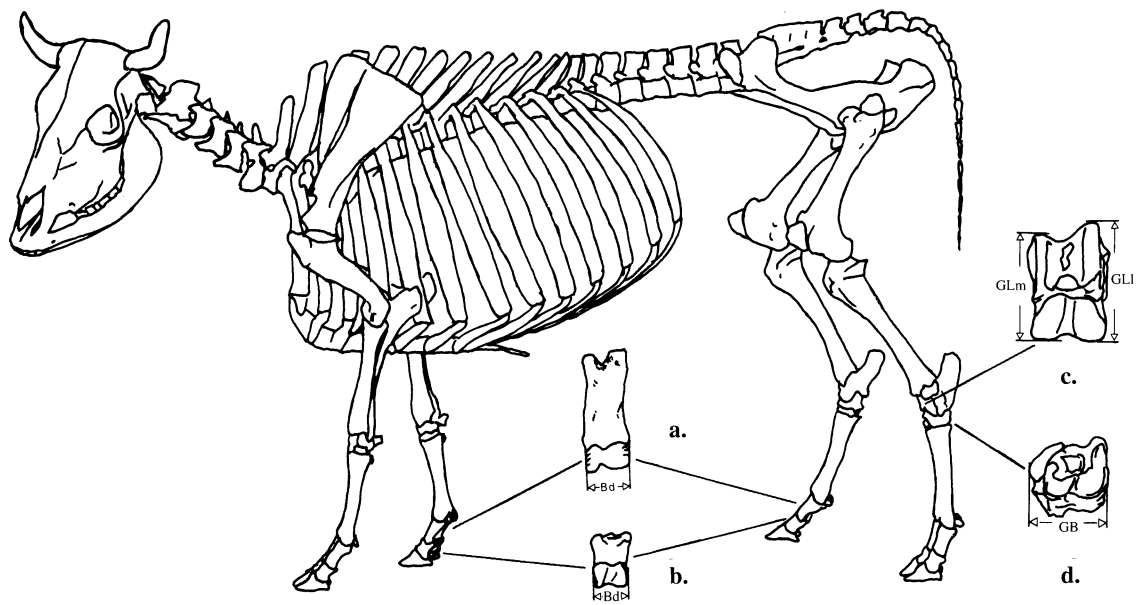

Fig. 3: *Bos taurus* skeletal parts and areas measured for cattle size comparison: a. *phalanges proximales, manus/pedis*; b. *phalanges mediae, manus/pedis;* c. *talus*; d. *os centroquartale.*

Table 1: *Bos taurus* specimens in the Department of Archaeozoology, Transvaal Museum, used in osteometrical comparisons seen in fig. 3.

Os centroquartale		*Talus*		*Phalanx 1 or 2*	
AZ 1	Pedi, ♀	AZ 1	Pedi, ♀	AZ 1	Pedi, ♀
AZ 21	Nguni, ♀	AZ 21	Nguni, ♀	AZ 21	Nguni, ♀
AZ 114	Nguni, ?	AZ 114	Nguni, ?	AZ 55	Nguni, ♀
AZ 115	Nguni, ?	AZ 115	Nguni, ?	AZ 56	Nguni, ♀
AZ 116	Nguni, ?	AZ 116	Nguni, ?	AZ 536	Ng-Tsonga, ♀
AZ 117	Nguni, ?	AZ 117	Nguni, ?	AZ 640	Nguni, ♂
AZ 536	Ng-Tsonga, ♀	AZ 118	Nguni, ?	AZ 697	Friesian, ♀
AZ 640	Nguni, ♂	AZ 536	Ng-Tsonga, ♀	AZ 698	Friesian, ♀
AZ 697	Friesian, ♀	AZ 697	Friesian, ♀	Pal 71.23, ?, ?	
AZ 698	Friesian, ♀	AZ 698	Friesian, ♀		

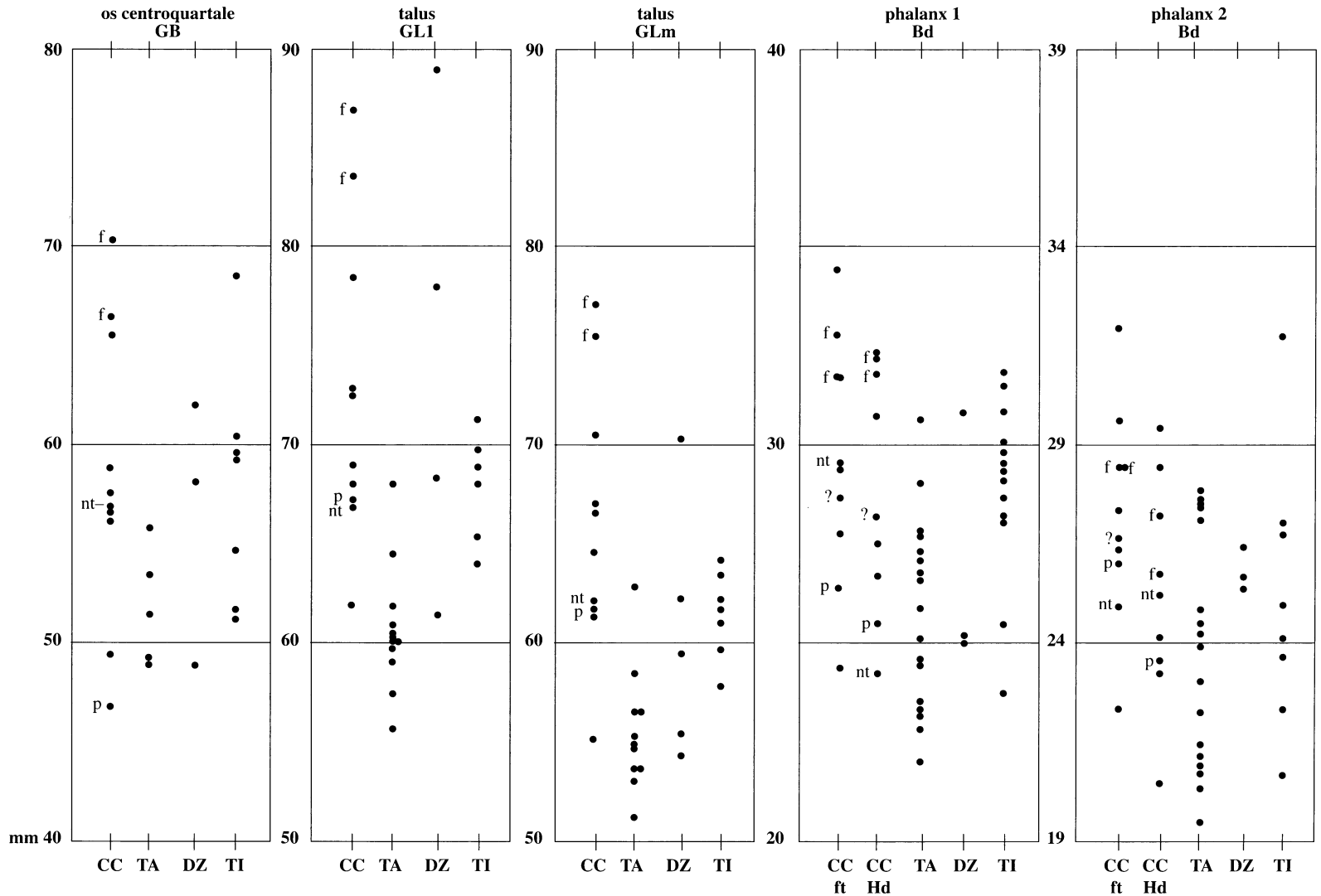

Fig. 4: *Bos taurus* osteometrical data from the modern collection and site material. CC: comparative collection; TA: Tavhatshena; DZ: Dzata; TI: Tshirululuni; Ft: front; Hd: hind; f: Friesian; n: Nguni-Tsonga; p: Pedi; ?: breed unknown. All other points are Nguni for the comparative collection. Each point is one measurement.

Discussion

The plotted measurements from the archaeological collection show a marked difference in the size range between Tavhatshena, Tshirululuni and Dzata. Most often, Tavhatshena cattle are smaller. The few points plotted for the Dzata material show a tendency for wide variation with seemingly more robusticity than in the Tavhatshena sample.

Based on visual inspection of the plots, some suggestions can be made regarding the chronological variation of cattle size. According to the dates, the wide variation at Dzata may be the beginning of a selective process for larger cattle. According to most ethnographies, herd size took precedence over quality (Stayt, 1931; Mansvelt and Skinner, 1962; Denbow, 1983), and some societies selected for coat colour. Nevertheless, in some cases such as "royal herds" at Dzata and Tshirululuni, individual size may have also been considered.

On the other hand, the larger cattle at Dzata and especially Tshirululuni may be the results of tribute or new breeds brought from Zimbabwe. According to Portuguese documents, a Torwa dynasty ruler of Butua in southwestern Zimbabwe owned cattle "as big as the large oxen of France...". Friar Gomez noted in the mid-17th century that cattle in this area were so large that "one had to stand when milking them" (Mudenge, 1974: 389). This is considered an exaggeration, but these cattle did appear to have made a great impression on the friar. According to Beach (1980), the Changamire dynasty conquered the Torwa in Butua, and shortly afterwards, the Singo, and off-shoot of the Changamire, settled in the Nzhelele valley area. Dzata is located in this valley. It can therefore be considered a possibility that the Singo brought several of these large beasts with them. Unfortunately, the few bones from Dzata are insufficient to corroborate this possibility.

Other very important aspects need to be considered regarding size variation in cattle. Environmental factors may provide some explanation for the size differences. For example, the quality of the veld needs consideration, as this directly relates to diet and nutrition. Veld and soil types, and rainfall averages of the three site areas were examined, but were found to be too generalized (Weather Bureau, 1957; Soil Research Institute, 1965; Acocks, 1988). For example, Acocks' veld types are based on broad averages whereas mountains and foothills create many small habitats. In addition, the long occupation of the areas by Iron Age peoples may have caused substantial changes. Grassland types were also examined in greater detail to note whether pasturage can influence cattle size. O'Connor (1985) notes the interrelated factors and characteristics that dictate grass yields and basal coverage, and ultimately nutritional quality. The factors include: semi-arid or mesic savanna, soil type, such as heavily textured or sandy soils and their capacity for retaining moisture, rainfall and seasonal fluctuation, grass populations and successions, the grass/woody ratio, fire, and finally, livestock grazing pressure. It seems that the environmental evidence needed to explain cattle size differences is complex and at present elusive.

An expert on traditional southern African cattle breeds (K. Ramsay, pers. comm.) states that the natural environment is a great factor in determining size. More specifically, the veld may change but soil types are less variable in an area. Following from this, one can know what type and size of cattle can survive and procreate. The types of soils in an area dictate the type of pasturage and therefore the crude protein, total digestible nutrients and essential minerals available to the cattle. A good balance of these in a sweetveld context can create large cattle (Ramsay, 1993a, b).

According to his observations, the Tavhatshena area today is sweetveld. The environment here creates larger cattle, larger than those living in the acidic soil environment in the area of Tshirululuni. The evidence of the plots point to the opposite. He posits that climate is also a factor, in that temperature and humidity can keep cattle small, that is, that their offspring will remain a size suited to the climate. Therefore, looking again at the evidence, he did note that migrations of cattle to the areas, like Tshirululuni, cannot be ruled out.

Looking briefly at the climate at the time of these sites (Tyson and Lindesay, 1992), a warm phase spanned several centuries ending in the 14th century. A "little ice age" followed this, ending around the mid-19th century. The cooler phase meant drier conditions in the northern Transvaal area, which meant little summer rainfall and cooler temperatures. It is unknown at this point whether it was just dry enough to create sweetveld pastures for better grazing, and cool enough to allow an increase in the size of the cattle at the later site; or whether it was so dry as to create instability and drought situations. If this was the case, then environment, and more specifically, what is known about the prehistoric climate, cannot explain the variation in cattle size between the early and more recent sites.

A last point that could be made is that the sample is restrictive. Most of the cattle examined from Tshirululuni could be oxen as these grow to a far greater size than cows or bulls. It is felt that this is probably not so, but only more samples can negate this. For now, nothing can be left out of the equation.

Conclusion

At this point, both human intervention and environmental factors could have created the differences in cattle size. To obtain more concrete results, a larger modern

comparative sample with more breeds is needed and, of course, more material from these sites.

If it can be shown that cattle sizes are indeed strictly related to the natural environment, then these cattle may become the indicators of those earlier environments. This study will not be in vain. There has been a surge of interest recently in reviving traditional southern African cattle breeds. The results of these types of studies may help in the recent debate on what cattle were present in different areas in the past, and can this still hold true for today?

If, however, the cattle do not "fit" the environment, then other interesting situations may be involved, such as human migrations, cattle importations, or large exchanges of cattle. The cattle may even indicate the results of selective breeding, large outbreaks of disease, malnutrition, and good or poor herd management techniques.

This study is only in its initial phase. Many boxes of Iron Age cattle material are housed at various universities and institutions, spanning the range of the southern African Iron Age. These bones need to be measured and perhaps with further analyses, there will be more answers than questions.

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