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Invisible herders? The archaeology of Khoekhoe pastoralists

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ABSTRACT

Although based on strong historical, linguistic and ethnographic evidence, the conclusion that immigrant Khoekhoe pastoralists introduced the first livestock to southernmost Africa finds no convincing archaeological support. This may be for a number of reasons. Perhaps nomadic pastoralists leave no archaeological traces; or migrations are difficult to detect. Archaeology and the other disciplines may not be looking at the same thing. Or maybe the migrations date to the second millennium AD, long after the first livestock had reached southernmost Africa. It is not easy to tell: Later Stone Age animal bones, stones and pots do not broadcast the language and identity of the people who discarded them.

KEY WORDS: archaeology, Later Stone Age, southern Africa, Khoekhoen, pastoralists, herders, migration, diffusion.

For archaeologists, the word 'Khoekhoe' evokes seventeenth century herders at the Cape of Good Hope, rich in cattle and sheep, seasonally transhumant, organized in hierarchical lineages, and living in kraals of up to a few hundred mat huts amongst which livestock were kept safe at night (e.g. Boonzaier *et al.* 1996; Elphick 1985; Kolbe 1719). For linguists, Khoekhoe is one of several languages in a linguistic family called Khoe. Khoe languages form one of the two major subdivisions of click, or Khoisan, languages in southern Africa, the other being 'non-Khoe' (Vossen 1997; see also Heine & König this volume; Güldemann this volume). All agree that the speakers of non-Khoe were the autochthonous hunter-gatherers of the subcontinent. Speakers of Khoe languages may have been indigenous as well, but not everyone agrees.

In the late fifteenth and early sixteenth centuries, the first Europeans at the Cape, Portuguese mariners, encountered locals with livestock (Raven Hart 1967; see also Fauvelle-Aymar this volume). Later, the English and Dutch seafarers in the late sixteenth and seventeenth centuries exchanged metals for cattle and sheep with the locals. The availability of livestock was one reason why, in the mid-seventeenth century, the Dutch East Indies Company established a refreshment station where Cape Town now stands. The conventional view is that livestock, which clearly was not locally domesticated and had to have come from the north, was introduced to the Cape by Khoekhoen[1] about 2000 years ago (e.g. Ehret 1982, 1998; Elphick 1985; Smith 1992, 2005). Although their point of origin remains a subject of debate, a migration of Khoe-speaking nomadic pastoralists parsimoniously explains both the presence of 2000-year-old bones of livestock and the Khoekhoe language at the Cape. A side effect of this conventional view, however, is that it makes the first herders at the Cape look like the seventeenth century Khoekhoen.

What archaeological evidence supports the conventional view? Strictly speaking, none. This is odd because linguists and ethnographers seem fairly certain that Khoe-

[1] Throughout this paper, 'Khoekhoen' is used as a proper noun designating the people, while 'Khoekhoe' is used as an adjective. Khoekhoe is also used as a proper noun to designate the language of the Khoekhoen.

speaking pastoralists have occupied southern Africa for at least two millennia, if not more. Why then the lack of archaeological evidence? There are several possible reasons. It could be that nomadic pastoralists leave few visible archaeological traces (Smith 2005, 2006 and this volume), and that the Khoekhoen of the first millennium AD have simply slipped through the archaeologist's sieve. Alternatively, it could be that Khoekhoe pastoralists are invisible in the first millennium because they are a social construct specific to the mid-second millennium AD. They may not have existed as a coherent cultural entity in the first millennium, although the separate elements that later constituted that identity—the language, economy, kinship system, mentality, livestock and herding practices, etc.—already may have been present. A third reason may be (as Heine and König suggest in this volume) that linguists, ethnographers, historians and archaeologists operate in different dimensions and use incompatible data: what is clearly visible to one discipline may not even appear on the other's radar.

It is difficult to refute any of these negative propositions. This paper aims simply to review the archaeological evidence, and concludes that the absence of evidence for Khoekhoe pastoralists in the first millennium AD[2] archaeology of southern Africa can be explained by their arrival during the second millennium: that the Khoekhoen essentially did not exist in the first millennium and thus could not have had anything to do with the initial spread of livestock and ceramic technology.

IMMIGRANT KHOEKHOEN?

No one doubts that the seventeenth century livestock in the possession of Khoekhoen at the Cape originally came from the north: the wild progenitors of sheep and cattle never existed in sub-Saharan Africa so they could not have been locally domesticated. No one thinks the livestock wandered south by themselves. The simplest option is to think that the livestock came with the Khoekhoen, which means they too were immigrants. Khoekhoe was first considered a Hamitic language (Meinhof 1910: 179–201, 1912: 4; Schapera 1930: 43; Seligman 1939: 33; Stow 1905: 236). Later, linguists placed proto-Khoekhoe further south, somewhere in what is now northern Botswana (Bleek 1929; Westphal 1963). Cooke (1965) traced a Khoekhoe migration route by connecting on a map the then known rock art depictions of sheep; a route which paralleled the one proposed by Stow (1905). Fleshing out the migration model, Elphick (1977, 1985; see also Smith 1990: 65) proposed that it was in northern Botswana that another immigrant folk, Bantu-speaking farmers and herders from East Africa, initially supplied livestock and the skills of herding (plus that of making ceramic vessels) to a local group of Khoe-speaking hunter-gatherers, the ancestral Khoekhoen, who in their turn migrated south and west in search of new pastures. A variation of this two-step model was proposed by Ehret (1998), who suggested a pre-Bantu, Eastern Sahelian group as the ultimate source for the livestock that reached the ancestral Khoekhoen in northern Botswana. More recently, archaeologists have identified a style of finger painted geometric image as the work of Khoekhoe pastoralists, and have traced a migration along major river valleys, all the way from central to southernmost Africa (Eastwood & Smith 2005; Smith & Ouzman 2004). This identification remains controversial (see comments following Smith & Ouzman 2004).

[2] Dates are reported as BC (Before Christ) or AD. The archaeological dates are based on calibrated radiocarbon age determinations. For details of calibration method used see Sadr & Sampson 2006.

In the latest publications (including papers in this volume), further variants of the Khoekhoe migration have been proposed. Blench (in press) proposes a link with Cushitic speakers. Ehret's contribution in this volume carries on from his 1998 model with new dates assigned to the branches of Khoekhoe. Andrew Smith (2005, 2006, this volume) continues to see an origin for the Khoekhoen in East Africa and points to the ceramics as evidence. Along similar lines, Güldemann (this volume, in press) proposes a linguistic link between some ancestral populations in East Africa and more recent ones in northern Botswana and further from the Kalahari to the Cape. At each step of the way southwards, the linguistic link (and one presumes the genetic and material-cultural link) was diluted more and more through contact and exchange with local non-Khoe hunter-gatherers, such that from southernmost Africa a material-cultural link with the ancestral areas to the north and northeast would hardly be recognizable. Fauvelle-Aymar (2004, this volume) proposes a comparable process, but traces the origins of Khoekhoe pastoralism farther north into a Nilo-Saharan population, whose southward migration he describes as the percolation of segmentary lineages through several other populations and cultures along the way. Only a few of their cultural traits reached the Cape intact, notably their highly specialized herding practices.

Several archaeologists have remained sceptical of the link between Khoekhoen and the earliest livestock in the subcontinent. Deacon (1984) and Klein (1986) did not think there was enough evidence to rule out local adoption of livestock by hunter-gatherers. Kinahan (2001a) argued in favour of local adoption in more detail, using evidence from rock shelter sites in the Brandberg (Dâures Massif) of Namibia. Sadr (1998, 2003) continues to point out the absence of archaeological evidence for a migration of northern pastoralists 2000 years ago.

Before describing the archaeological evidence in more detail, it is worth repeating some salient points raised in this volume by Bernd Heine and Christa König. In their view, the linguistic evidence for Khoekhoe origin and migration is not as solid as non-linguists assume. The secure conclusions based on Vossen's (1997) comparative analyses are that Khoe languages represent a completely different family from the non-Khoe languages, and that the speakers of proto-Khoe were shepherds (see also Barnard this volume). Heine and König think that if Khoekhoe came to be spoken in patches from southern Angola to the Eastern Cape by a process of expansion rather than fragmentation (the latter cannot be ruled out), then it originated in the Kalahari, on the borderlands between today's Botswana and Namibia, not in northeastern Botswana, nor Central, nor even East Africa. And, that the expansion of the language need not have happened with a migration of the people. The age of the proto-Khoe can in their view reasonably be estimated at 2000 years or more. It thus seems we are on safe ground only in thinking that the seventeenth century Cape Khoekhoen were in some sense descendants of an ancient proto-Khoe population of shepherds. And the strongest argument linguistically places the proto-Khoe in the wetter Kalahari of the first millennium BC. All else remains debatable, including ideas of the Khoekhoen as immigrants, or as hybrid products of percolation, and of the date when Khoekhoe came to be spoken at the Cape.

What light can archaeology shed? That too is debatable. The data used by archaeologists, historians, linguists and ethnographers are not directly comparable as they come from different temporal, spatial and demographic scales. Their diverse observations do not necessarily coincide. Occasionally, archaeologists can rely on special

lines of evidence—such as seasonal migration patterns (Kinahan 2001a), or the presence of livestock dung in an archaeological layer (e.g. Deacon *et al.* 1978; Sandelowsky 1977; Smith & Jacobson 1995), or the remains of stock enclosures (e.g. Arthur 2008a, this volume; Kinahan 2001a; Sampson 1996)—to distinguish Later Stone Age (LSA) herders from hunters. Mainly however, southern African LSA specialists have to deal with disturbed sites offering palimpsests of animal bones, ceramics and stone tools. Some of these smeared residues of past activities, and the problems of attributing them to specific historical actors, are summarised below.

THE ARCHAEOLOGICAL EVIDENCE

Livestock

Were proto-Khoe the first pastoralists in southern Africa? Archaeology can answer this question only in part, by providing a date and a context for the earliest livestock bones in the subcontinent. It also might indicate whether pastoralists or casual herders discarded the bones. But in the absence of written records archaeology cannot tell us what language the herders spoke.

Bones of livestock (mostly sheep, some cattle, but no definite goats) have been dated to the first centuries BC and AD in LSA contexts from northern Botswana, as well as the west and south coasts of South Africa (Henshilwood 1996; Robbins *et al.* 2005; Sealy & Yates 1994; Vogel *et al*. 1997). There is little reason to doubt the validity of the age estimate as the AMS radiocarbon dating method is standard procedure and the samples, the actual bones themselves, were processed in reputable laboratories. Better grounds for doubting the dates might be the identification of the bones as domesticated livestock. Many of the post-cranial bones of livestock cannot easily be distinguished from wild animals in the same size class. Cranial bones, and especially teeth, are the most diagnostic skeletal features of livestock and some faunal analysts positively identify livestock only on this basis. Most of the early AMS dates on livestock were obtained from post-cranial bones, so some residual doubt remains as to their correct identification. But if one accepts the probability that at least some of the early dates really come from livestock bones, one can conclude that the earliest livestock in southern Africa are about two or three centuries older than the oldest securely dated villages of iron-using farmers and herders south of the Zambezi (Morais 1988; Sadr & Sampson 2006).

Beyond their antiquity, two other relevant questions can be addressed to the faunal remains. First, do the earliest livestock on LSA sites occur in contexts indicating a pastoralist adaptation? And second, do they occur in contexts that can be associated with an immigrant population?

In the absence of direct evidence, such as elaborate burials or architectural remains revealing settlement layout with stock enclosures, the first millennium AD LSA sites cannot reveal whether the occupants had the ideology, mentality and kinship system of pastoralists. In answering the first question we therefore have to use proxy evidence. Faunal remains are the best proxy we have. Throughout Africa, pastoralist sites are commonly identified by a predominance of livestock bones in the mammalian faunal remains (e.g. Garcea 2003: 120; Gifford-Gonzales 1998: 175–80). Usually, the pastoral phase in any given region is preceded by a period of casual herding, where few livestock bones are found in a predominantly wild faunal assemblage (Cremaschi & Di Lernia 1998; Hassan 2002; Kuper & Köpelin 2006).

Relying on the proportion of livestock bones to distinguish pastoralists from herders is not unproblematic. Some of the potential problems include taphonomy and specific cultural practices. Taphonomic agents such as scavenging dogs and natural erosion can selectively remove some bones from the archaeological site. As for cultural practices, one can cite the example of modern pastoralists in northwestern Namibia who remove livestock bones from their settlements in order to protect their cattle from botulism (Kinahan 2001b). In some archaeological (Kinahan 2001a: chapter 3) as well as modern cases (Hitchcock 1978), livestock were kept away from the main settlements. All of these factors potentially can lower the numbers of livestock bones in pastoralist's sites. Of these, taphonomic agents are simplest to detect for they would affect all bones on the site, and leave diagnostic traces behind. The deliberate removal of a particular class of faunal remains would be practically impossible to detect in first millennium AD LSA sites. Livestock might be butchered at remote stock posts, but that would not necessarily prevent some of their bones reaching the main settlement's middens. Given our low stock of relevant archaeological, ethnographic and experimental evidence, one can do no more for now than to point out these potential problems, before returning to a discussion of the best proxy evidence we have.

Southern African LSA sites generally contain few livestock bones. Published reports of 102 LSA site components include 88 with less than 10 % livestock bones (Table 1, after the references). The proportion of livestock bones in these sites is unlikely to be so low because pastoralists rarely eat their stock, as some claim. To put the numbers in perspective, southern African iron-using, village-dwelling pastoralists, who revered their animals and gave a central position to cattle in their daily lives, and who rarely ate them except on special occasions, have left behind kitchen middens where livestock bones regularly account for more than 40 % of the mammalian faunal remains (e.g. Huffman 2007) (Table 2, after the references). Such high proportions are only seen on about 4 % of the southern African LSA sites.

If not due to specific cultural practices that removed livestock bones from LSA sites, the dearth of LSA livestock may suggest a casual herding strategy of the kind recorded among mid- to late twentieth century Kalahari foragers who kept small flocks of goats (Ikeya 1993; Kent 1993; see also Barnard this volume). These Kalahari 'hunters-with-goats' may represent a transitional stage to pastoralism, from a 'Mesolithic' to a 'Neolithic' mentality (Barnard 2007, this volume). Or perhaps they represent a distinct 'pastro-foraging' subsistence strategy that is no longer common. In any case, the low proportion of livestock bones on the modern Kalahari goat-herders' sites (e.g. Kent 1993: appendix) falls within the range found on most LSA sites in southern Africa.

What of the few LSA sites with exceptionally high proportions of livestock bones (Table 1)? Layer 4 at Makwe rock shelter in eastern Zambia has dates from the third to the tenth centuries AD and contains nearly a hundred identified mammalian bones (Phillipson 1976). Layers 5 and 6 at this site have somewhat larger bone samples and a higher proportion of livestock. Makwe rock shelter was located close to an Iron Age village, so the wealth of livestock (and Iron Age ceramics) here could represent service to the villagers (cf. Sadr & Plug 2001), rather than pastoralism in pre-contact LSA sites. Among the other livestock-rich LSA sites, the two sites at Kabeljous River Mouth and the North Mound at MAS (both in the Eastern Cape Province) are coastal shell middens, each with less than twenty identified mammalian remains (Table 1). On some of the

sites, the bones were unsystematically collected from the surface (Binneman 1995). Nonetheless, their high proportion of livestock is puzzling. More representative samples of bones, and more dates, are needed from this under-researched area. Of the other LSA sites with high proportions of livestock, a few are neighbouring localities on the hill Kasteelberg, about 140 km north of Cape Town. The other example is at Jakkalsberg near the mouth of the Gariep (Orange) River (Brink & Webley 1996). Most of these sites have adequately large samples of identified mammalian bones, and all date to the second half of the first millennium AD. Kasteelberg A (KBA) and Jakkalsberg have been published as pastoralist Khoekhoe sites (Smith 2006: 71; Webley 1997). They are exceptional sites in both senses of the word. The majority of contemporaneous LSA sites on the west coast of South Africa, with identical ceramics and stone tools, contain much lower percentages of livestock remains. An alternative reading of sheep-rich KBA and Jakkalsberg is that they represent (rare) feasting sites of the local 'hunters-with-sheep' (Sadr 2004). The issue remains to be settled.

In sum, the generally low numbers of livestock remains in the LSA sites do not bring pastoralism to mind. At face value the evidence shows livestock appearing around 2000 years ago in existing hunter-gatherer sites in widely separated parts of southern Africa. There are large areas of the subcontinent, such as the highveld for example, where LSA sites have not yielded evidence for early livestock. It remains to be seen whether and to what extent these are real gaps rather than an artefact of research coverage. There certainly are methodological problems with using numbers of livestock bones as an index of pastoralism, but the sum of current evidence indicates the arrival of livestock apparently did not cause a significant change in local subsistence and settlement strategies. The same LSA sites continued to be inhabited by people making the same kinds of stone tools as before, and hunting the same range of wild animals as before. The two sites in the Eastern Cape with high proportions of livestock bones are an enigma, but on the west coast of South Africa the sheep-rich sites can be interpreted as special purpose locations for feasts.

A logical problem with the interpretation of casual herding in the first millennium AD LSA sites is that such low numbers of livestock may not represent a viable breeding stock (Smith 2006: 70, this volume). In that case, the LSA sites with few livestock bones may indicate the presence of nearby (Khoekhoe?) pastoralists, whose own sites remain below the threshold of archaeological visibility. We will return to the invisible herder argument below. For now, suffice it to say that the point about viable breeding stock assumes an inflexible herding strategy. There are many ways that small flocks can be brought together at the right time to create conditions suitable for the propagation of the species. The goats in the Kalahari (Kent 1993: 484, 486) suggest one example of how such low intensity herding can be made viable. Similarly low proportions of livestock in the Saharan pre-pastoralist sites (Cremaschi & Di Lernia 1998; Garcea 2003; Kuper & Kröpelin 2006; Wendorf & Schild 1998) provide a wealth of archaeological examples to show that small herds are viable.

Another criticism of the idea of casual herding among LSA hunter-gatherers is that without migrating pastoralists, who knew precisely how to look after their flocks of sheep and herds of cattle, the animals would never have spread throughout the subcontinent (Smith this volume). In this argument, parsimony dictates that immigrant Khoekhoe pastoralists escorted the livestock. Certainly, defenceless livestock could not have wandered by themselves for very long. Experienced herders—bodyguards in

all but name—had to have accompanied these animals; but did they all necessarily come from only one pastoral community, the Khoekhoen? Logic suggests that the process could have taken place step by step, with an initial group of pastoralists introducing the skill to a neighbouring group of hunter-gatherers, who then spread the skills and the animals to their other hunter-gatherer neighbours, and so on down the line.

A useful analogy for just such a transfer of domestic animals and the required herding skills is provided by the spread of horses among Native Americans in the seventeenth and eighteenth centuries. Haines (1938b) thinks that around AD 1600 horses and riding skills were transferred from the Spaniards in New Mexico to Pueblo Indians in their service. Some of the latter subsequently escaped to unconquered groups, taking their horses and riding skills with them. By the 1650s the Navajo were stealing horses and a decade later the Plains Apache were acquiring them by trade. Forbes (1959) prefers to think that the initial transfer of animals and riding skills took place some 60 years earlier and about 1500 km further south in the Guadalajara region of Mexico. In his view, the Indians of north central Mexico

> may have learned by watching the Spanish and then mastering the art by trial and error, or they may have learned from anti-Spanish Mexicans or Tarascans who had joined their ranks, or they could have mastered the art by contact with the many bands of runaway Negroes and mulattos who were raiding in the region (Forbes 1959: 191).

By any and all possible means,[3] the horse reached the upper Mississippi Valley, southern Canada and northernmost California by 1770 (Haines 1938b: fig. 1). That is to say it took only about two centuries for the horse to spread without any accompanying Spaniards throughout an area somewhat larger than Africa south of the Zambezi. If the horses had spread unrecorded and sixteen centuries earlier, the inevitable standard error of radiocarbon dating would have made it very difficult to tell from which direction and by which route they had arrived. Not surprisingly then, and not for the lack of trying (Bousman 1998; Russell 2004), we have yet to establish such details about the spread of livestock in southern Africa. All we can state with confidence is that the discrepancy in radiocarbon dates indicates that the initial source of the livestock is unlikely to have been immigrant iron-using farmers (contra Elphick 1985; Smith 1990).

Worldwide, there are several well-documented archaeological cases where sheep also must have spread by just such a process of down-the-line diffusion. One example will suffice. Sheep were originally domesticated at least twice in the ninth millennium BC in the northern parts of the Fertile Crescent (MacHugh & Bradley 2001: fig. 2; Smith 1998). By the sixth millennium BC sheep and/or goat are found in Nabta Playa, in the Western Desert of Egypt (Wendorf & Schild 1998: 105). Some archaeological evidence suggests that the small livestock came across the Red Sea from southern Sinai around 6000 BC (Close 2002). Clearly they must have been brought over by herders, but the archaeology of Egypt has yet to reveal any evidence of a migration of pastoralists from the Sinai. Neither Nabta Playa, nor any of the other sites farther west in the Sahara show evidence of immigrants from east of the Nile. Here too then, down-the-line diffusion provides the best explanation for the transfer of livestock and herding skills.

[3] Wissler (1914: 9) assumed that the first horses to fall into the hands of the Native Americans were strays from the Coronado expedition of 1540–42. Indeed, unlike sheep and cattle in southern Africa, feral horses in North America could have spread by themselves. Later writers, however, discounted the stray horse theory, and it seems that the riding skills must have initially been learnt from the Spaniards (Haines 1938a).

Ceramics

Besides animal bones, ancient potsherds are also relevant to this discussion and can potentially provide evidence for Khoekhoe pastoralists in two ways. Directly, they can point to intensive pastoralism if the pots regularly were used for storing or processing secondary pastoral products such as milk. Indirectly, they can help trace human migrations: spatial continuity in the style of decorated pots has traditionally been taken as strong evidence for migrations in prehistory. The assumption is that a migrating folk will carry on producing the same style of ceramics, and any changes in ceramic fashion will be gradual and leave a chain of linked styles across the landscape. With the help of radiocarbon dating, the direction and tempo of migration can be assessed. Well-known case studies include the Lapita stamped ware, which spread across 5000 km of island chains in Melanesia from 1600–1000 BC (Bedford *et al.* 2006; Sand 1997; Spriggs 1995). Similarly, *Linien Band Keramik* or LBK was taken to document migration in the Danubian Neolithic between 5300–4900 BC (Dolukhanov *et al*. 2005; Gronenborn 1999; Quitta 1960). In Africa, Iron Age migrations have also been documented archaeologically with the help of ceramic styles (Huffman 1989; Maggs 1984; Phillipson 2005; but see Eggert 2005: 319–23 for critique).

Although the first millennium AD southern African LSA ceramics are technologically related (they are all thin-walled and quite distinct from thick-walled, Iron Age ware; see Sadr & Sampson 2006), stylistically they form separate regional clusters (Sadr 1998, 2008). There is no clear stylistic chain that connects northern and southern LSA ceramics in the early first millennium AD. The best that a close examination can provide are curious similarities in a few attributes, such as technique of decoration and the use of spouts, between the early first millennium AD Bambata pottery of the Limpopo and northern Kalahari Basins, and the mid-first millennium AD spouted Cape Coastal pots of South Africa (Sadr 2008). But significant differences in other aspects of these archaeological entities, such as ceramic vessel forms and subsistence strategies, prevent a straightforward interpretation of migration.

In any event, ceramic stylistic evidence may not be appropriate here. The classic examples such as Lapita, LBK and the southern African Iron Age all involve the intrusion of village farmers into unoccupied landscapes or ones inhabited by mobile hunter-gatherers. The economic and cultural differences between residents and newcomers would have been pronounced. But the technology, settlement pattern and life ways of the Khoekhoen are thought to have been, at a general LSA level, fairly similar to that practiced by the local hunter-gatherers. Their material differences may have been muted. Elsewhere, pastoralist migrations into hunter-gatherer and farmer territories, such as the retreat of Saharan herders into the Niger and Nile River valleys of the third and fourth millennia BC, may be detectable in general ceramic similarities but not as clear stylistic chains (Warfe 2003; Watson 2005). In any case, ceramic styles need not behave in such predictable ways (e.g. Hodder 1982), and clear chains across vast spaces do not always reflect folk migration (Livingstone Smith 2007: 195). In a new twist, even the extreme stylistic conservatism of LBK arguably could signal local adoption rather than migration (Robb & Miracle 2007).

As for the use of LSA pots in storing and processing secondary pastoral products, very few sherds have been examined for residues and these come from only two parts of the subcontinent. The results cannot be taken as representative, but it is interesting to

note that on the west coast 20 mid- to late first millennium AD potsherds from the site KBDe, one of the LSA sheep-rich localities on Kasteelberg discussed in the previous section, showed they had all been used to store or process marine mammal fat (Copley *et al.* 2004; see also Patrick *et al.* 1985). And in the central Karoo, some thin-walled, fibre-tempered pots seem to have been used to process springbok meat (Bollong *et al.* 1993), although here the residue could have come from springbok blood used to strengthen the pot (Laidler 1929: 759).

In sum, the ceramic data do not point to an early first millennium AD migration of pastoralists from north to south. But the evidence is not conclusive for two reasons. Few samples have been submitted for residue analysis, and ceramic styles do not infallibly document migrations. In the conclusion, we will return to the difficulty of spotting immigrants in the archaeological record.

Lithics

The evident diversity in LSA stone tool assemblages initially was attributed to different cultural traditions (e.g. Goodwin & Van Riet Lowe 1929). More recently, it has been interpreted as the residue of different activities (e.g. Parkington 1980), and as a result of straightforward chronological evolution in stone tool fashions and methods of production (Deacon 1984). Among the changes seen in the recent LSA stone tool assemblages, a fairly clear and widespread pattern dates to around 2000 years ago when in some regions scraping tools became more common, while backed elements such as segments (which are often identified as arrowheads) became rarer. There have been suggestions that this particular change might signal the arrival of immigrant Khoekhoe pastoralists (Sadr 1997). Smith *et al.* (1991) thought that on the west coast of South Africa, assemblages with many and diverse formal, retouched stone tools made on fine-grained silcrete were the work of the local non-Khoe hunter-gatherers. Other assemblages that lacked formal tools and silcrete were attributed to Khoekhoe pastoralists. Beaumont & Vogel (1984) and Beaumont *et al*. (1995) expressed similar ideas concerning the LSA sites in the Northern Cape province.

The results of an archaeological survey in the landscape around Kasteelberg tend to refute this interpretation. The survey covered a cross-section of the different types of landscape and detailed records were kept of the materials found on each of the 130 sites discovered (Sadr *et al.* 1992: fig. 2). A standardised surface collection strategy allowed quantitative comparisons between sites. Shell samples from 63 of the sites were radiocarbon dated, and it is the resultant chronology that sheds light on changes in stone tool assemblages over time. Given that the shell and stone tool samples were collected from the surface of exposed sites rather than excavated from sealed contexts, the noise to signal ratio in the patterns presented in Figure 1 is quite high, as the spikiness of the charts indicates. Despite the noise, interesting trends can be observed. Fine-grained raw materials such as silcrete did indeed give way to coarser quartz dominated assemblages through time (Fig. 1a & b). And overall, the numbers of different types of formally retouched tools did in fact drop (Fig. 1c), with backed elements and associated bits of lithic technology (like the production of bladelets) becoming numerically less important over time (Figs. 1d & e). But these changes, as the date lines in the diagrams show, started gradually and very early, some before 1000 BC or even 2500 BC. And the changes went through several stages. Thus, backed elements (arrowheads perhaps, but

also cutting implements) were more frequent before 2500 BC, adzes (wood-working implements) were common from 2500–500 BC (Fig. 1f), and (hide working?) scrapers became the ubiquitous tools thereafter. Rather than the sudden arrival of a new population, such gradual changes suggest a longer-term evolution in stone tool manufacturing and utilization habits. Indeed, Janette Deacon had already remarked in 1984 (p. 323) that "sites where both pre- and post-pottery/domestic stock assemblages occur show no significant difference in the stone artefacts through this sequence".

Another piece of stone tool evidence for cultural continuity comes from the recent technological analysis by Feldrik Rivat, at the time a post-graduate student in archaeology from the University of Toulouse-Le Mirail. He examined the production of flaked stone artefacts at two key sites, Witklip and Kasteelberg B (KBB). Witklip had been identified by Smith *et al.* (1991) as a San hunter-gatherer site and KBB as a Khoekhoe pastoralist

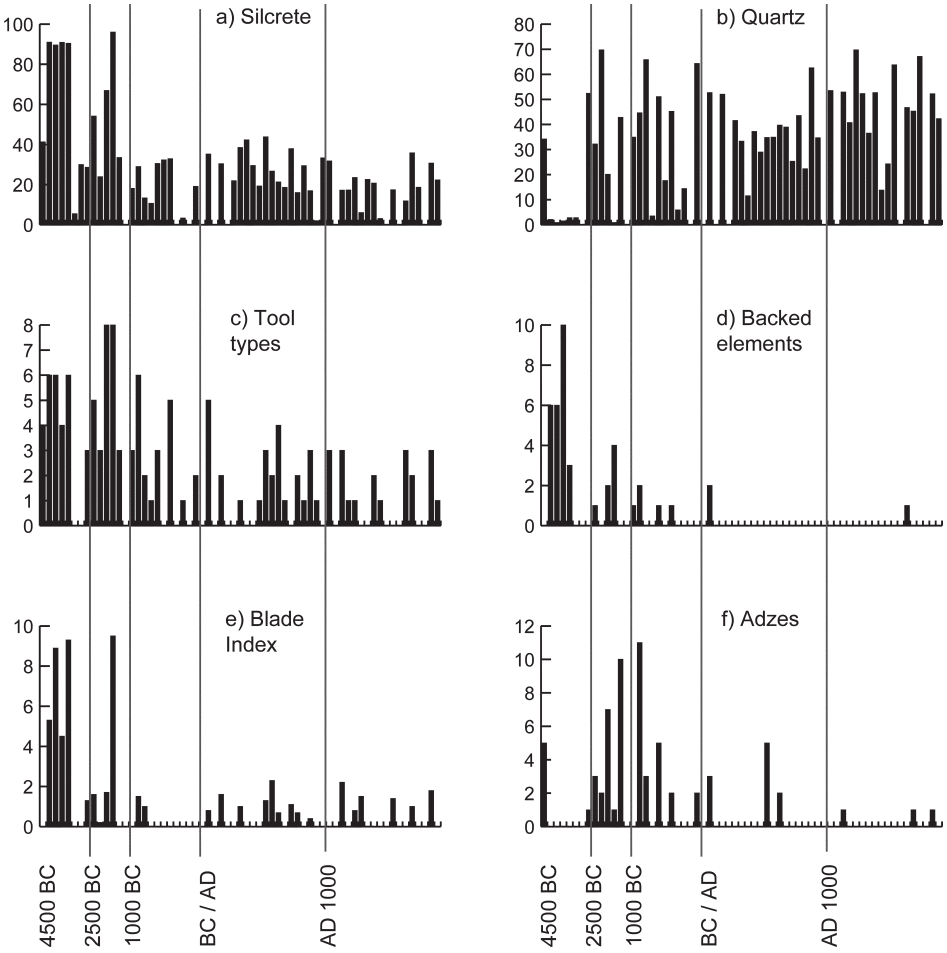

Fig. 1. Stone tool changes through time on the Vredenburg peninsula. The scale in a and b represents percentage. In c–f the number of individual specimens is provided. Each bar represents one of the 63 dated sites from the survey. The oldest are on the left.

site. Rivat (2006) found that in the stone tool assemblages from KBB a whole section of the chain of operations visible at Witklip, namely the use of silcrete and production of retouched formal stone tools, was missing. The rest of the assemblage, however, indicated similar technical choices. His conclusion (2006: 118) was that the absence at KBB of a part of the chain of operations visible at Witklip may signal different activities at the two sites, rather than different populations of stone tool makers.

In sum, the stone tool assemblages do not provide strong evidence for sweeping cultural changes around 2000 years ago (e.g. Parsons 2007). But typologies are perhaps not the best indicator, and it is technological studies like Rivat's that need to be multiplied. Do early first millennium AD stone tool making techniques, for example, link the Cape with the presumed homeland of the Proto-Khoe?

Ostrich eggshell beads

Smith (*et al.* 1991) suggested that the difference in the diameters of ostrich eggshell beads at Witklip and Kasteelberg indicated separate bead making traditions. Kasteelberg beads were on average a little larger than those at Witklip, and this was taken to represent a cultural marker to distinguish Khoekhoe pastoralists from San hunter-gatherers. The issue became a heated debate (Kinahan 1996a; Smith *et al.* 1996) and a definitive regional PhD project to study beads as economic and cultural markers was abandoned. The re-examination of a small sample of bead sizes from six sites on Kasteelberg suggested that the difference, as Kinahan (1996a) had also noted, may simply reflect changing fashions in this particular area, with average bead sizes going from 5 mm to more than 6 mm around 2000 years ago (Sadr *et al.* 2003).

INVISIBLE PASTORALISTS?

As the preceding has shown, there is no clear archaeological evidence for a 2000 year old migration of pastoralists from north to south. Some attribute this to the fact that they moved often and left little behind, thus remaining invisible in the archaeological record (Smith 2005: 44–8, this volume). Ethnographic examples of barely visible, recent herder camps have been taken to support this argument (e.g. Robertshaw 1978). But such ethno-archaeological observations are from the plastic and metal age where pots do not break so easily and stone flakes and chips are not produced by the dozen every time a cutting edge is required. If LSA sites of highly mobile hunter-gatherers can be found without difficulty even in the open landscape (e.g. Sampson 1985), there seems little reason why it should be more difficult to find the sites of mobile pastoralists.

Far from invisible, ephemeral sites of nomadic herders in fact have been recorded in various parts of the subcontinent. In the sandy areas north of Kasteelberg on the Vredenburg peninsula, extensive but low-density surface scatters of artefacts and vitrified dung dated to the fifteenth and sixteenth centuries almost certainly represent the remains of such pastoralists (Fauvelle-Aymar *et al.* 2006; Gronenborn *et al.* 2006). Similar late herder sites are now also known from the Berg and Breede river valleys (personal observation; Arthur 2008, this volume), and examples have been known in Namibia for some time (Kinahan 1996b, 2001a). In the central Karoo, hundreds of stone circles—herder's kraals—have been intensively investigated and all seem to date to the second millennium AD (Sampson 1996, in press). If we have little trouble finding pastoralists

in the second millennium, then archaeological invisibility is a poor explanation for their earlier absence.

INVISIBLE MIGRATIONS?

Another reason for the invisibility of Khoekhoe pastoralists may be that migrations are hard to detect archaeologically. In discussing migrations, we tend to imagine coherent movements of an entire folk, but ethnographically and historically we know these are rare events. Much more common are population drift and infiltrations, as Elphick (1985: 14–15) also suggested for the Khoekhoen. Although such diffuse movements might leave a trail detectable by linguists and ethnographers, they may leave no distinct archaeological spoor. Consider an extreme example from the Jura Mountains of two centuries ago. It is estimated that as many as 80 000 Swiss herders migrated across the border into France from the late 1820s until the 1920s (Olivier 2006). Initially, it was only the young men who migrated. Later, whole families moved. In their new homeland, their economic impact as expert cheese-makers and veterinarians was positive and immense. Given their cultural proximity, skills and the shortage of able-bodied men in the region at that time, they were welcomed by the locals. In turn, they assimilated themselves into the local culture to such a degree that visually they cannot be distinguished. Their archaeological footprint is invisible. But to this day the immigrants maintain a strong sense of their Swiss identity, sometimes even maintaining their Swiss nationality; they regularly get together to sing patriotic and nostalgic songs (Olivier 2006: 69).

It is a useful exercise to imagine the Khoekhoe pastoralist migration in the same light. Even though no clear estimate of the number of migrating Khoekhoen can be proposed, almost certainly it involved fewer than 80 000 souls. If the Khoe-speakers were not too culturally distant from the non-Khoe, and if they arrived by infiltration, it need not have left any distinct archaeological traces. Even if the cultural distances between immigrants and locals were greater, and even if the immigrating mass was larger and more coherent than the Swiss cowboys, percolation or hybridization (see Fauvelle-Aymar this volume; Güldemann this volume) could well have rendered the population archaeologically invisible. Between the extreme scenarios of a coherent, massed folk migration and no migration at all, there are many possible variants of demic diffusion (e.g. Robb & Miracle 2007), which would not necessarily leave the kinds of material traces that dirt archaeologists can pick up, even though the traces of contact and movement may be evident to geneticists, linguists and ethnographers.

LATE MIGRATION?

Before giving up on the archaeologist's ability to detect such things, it is worth pointing out further evidence from the second millennium AD that suggests a late Khoekhoe migration. One line of evidence is a type of pottery, lugged ware, which southern African archaeologists commonly associate with the Khoekhoen because such vessels were historically recorded in their possession (Bollong *et al.* 1997; Rudner 1979: fig. 4). Morphologically, lugged vessels are diverse and it is by no means sure that they can be linked in a stylistic chain from the Kalahari to the Cape. Nor can one assume that all makers of lugged pots were necessarily speakers of a Khoe language. But if the lugged

pots somehow mark Khoe, it is interesting to note that they appear throughout the western half of the subcontinent not much earlier than the turn of the second millennium AD (Sadr 1998). The extent of other material changes that accompanied the appearance of lugged pots at Kasteelberg—significant changes in the relative proportions of faunal remains, stone tool raw material preferences, ostrich eggshell bead sizes, and the incidence of bone tools (Sadr & Smith 1991; Sadr 1998: fig. 8)—strengthens the impression that this ware arrived at the Cape with immigrants. When looking for the material trace of new arrivals, this is the sort of pattern an archaeologist might expect to find.

Further suggestions of a late migration include handprints found in caves and rock-shelters in the Western Cape. Although not directly dated, the association and distribution of these handprints, as well as their position relative to other styles, convinced Yates *et al.* (1994) that these date to the early second millennium AD. The handprints seem to be stylistically related to the red geometric art found along the Limpopo and Orange River valleys, which have been identified as Khoekhoe art (Eastwod & Smith 2005; Smith & Ouzman 2004). Ben Smith has cogently argued that this style of art provides strong evidence for a migration of people from north to south, but precisely when this happened and whether the artists spoke a Khoe language remains to be shown. Nonetheless, the appearance of a new style of art possibly around the turn of the second millennium AD adds to a body of (admittedly weak) evidence in favour of a late Khoekhoe migration. We can also add here the evidence for pastoralism in Namibia (Kinahan 1996b, 2001a) and in the central Karoo (Sampson in press), which does not predate the turn of the second millennium. Taken all together, these different strands of evidence suggest that *if* a migration of pastoralists spread the Khoekhoe language across southern Africa, and *if* this migration were to be archaeologically visible, then it *might* date to the turn of the second millennium AD and not to the turn of the first millennium when livestock and ceramic technology began to spread among the local hunter-gatherer cultures by as yet unknown means.

CONCLUSION

Archaeologically, migrations are hard to detect but there were probably many in southern Africa during the last two millennia. That is not unexpected. Historians have noted (uncharitably, in the case of Trevor-Roper 1965: 5) what African oral traditions amply demonstrate, that people are constantly on the move. Comparative linguistic studies point in the same direction. Migrations happened, but they would have varied in the number of people involved, the rate and the direction of the movement, as well as in their nature, cause and effect. The apparent fact that in southernmost Africa cattle seem to have been introduced later than sheep (Klein 1986) may indicate multiple migration events. But the bare bones of archaeological evidence will not reveal which migration event involved Khoe-speakers. Languages leave no archaeological traces except in writing, and there seems to be no simple, universal, static, predictable link between linguistic groups and artefact style (e.g. David *et al.* 1991; Hodder 1982; Lemmonier 1986; Livingstone Smith 2007; MacEachern 1994).

The difficulty of detecting the archaeology of the Khoekhoe migration may have something to do with our essentialist theoretical stance as well, whereby we imagine the first pastoralists to have been similar to the seventeenth century Cape Khoekhoen.

But if cultures and identities are social constructs, they can form and dissolve rapidly. From this perspective, the seventeenth century Cape Khoekhoe culture (for example as described by Kolbe in 1719) perhaps only took on its final form in the second millennium AD and may have been restricted to the coastal areas on the western side of southern Africa. It certainly dissolved soon after contact with Europeans (Elphick 1985). That the culture was preserved in European writing, art and cartography—caught in the 'literary lattice,' as Anthony Humphreys (1998) puts it—may have imparted the false impression of an identity more stable and solid than it really was, and this in turn may have diverted us into thinking that it could be traced back wholesale into the first millennium AD. Archaeology can trace the origins of some of the cultural traits that constituted the seventeenth century Khoekhoe package: the pots, the livestock, the production strategies, and the art if not the language. These traits originated at different times and in different places and perhaps did not coalesce into the classic Cape Khoekhoe culture until the second millennium AD.

At best, the archaeological evidence suggests that LSA pastoralism (as opposed to casual herding) may have been a second millennium AD development in southern Africa. There is certainly no archaeological evidence to show that a coherent, mass migration abruptly brought livestock and ceramic technology to the Cape around 2000 years ago. The later spread of lugged wares, perhaps the geometric rock art, and the stone structures in the Karoo and Namibia may point to immigrant pastoralists at the turn of the second millennium, but whether and to what extent Khoe-speakers were responsible for any of these material traces is anyone's guess.

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TABLE 1

Faunal remains from a list of LSA sites and site components. The list is arranged from highest to lowest percentage of livestock bones. Some of the publications report minimum numbers of individuals (MNI); most counts are numbers of individual specimens (NISP).

Site	Location	Layer	Date	Mammals	Ovicaprines	Cattle	% livestock	Reference
Kasteelberg De	Western Cape	All	First mill. AD	1501	963	57	68.0	Kasteelberg Archaeological Project (KAP), not yet published
Jakkalsberg	Northern Cape	area B	First mill. AD	456	253	-	55.5	Brink & Webley 1996; Webley 1997
Kabeljous River Mouth	Eastern Cape	SM1A	First mill. AD	11	6	-	54.5	Binneman 1995
Kabeljous River Mouth	Eastern Cape	SM1B	No Date	7	3	-	42.9	Binneman 1995
Jakkalsberg	Northern Cape	area A	First mill. AD	1197	446	-	37.3	Brink & Webley 1996; Webley 1997
Makwe RS	Zambia	6, 5	Recent	107	2	36	35.5	Phillipson 1976
Kasteelberg A	Western Cape	All	First mill. AD	390	122	8	33.3	KAP
MAS North Mound	Eastern Cape	All	First mill. AD	15	1	4	33.3	Derricourt 1977
Kasteelberg M	Western Cape	All	First mill. AD	24	7	-	29.2	KAP
Kasteelberg G	Western Cape	5	No Date	4	1	-	25.0	KAP
Makwe RS	Zambia	4	First mill. AD	78	2	12	17.9	Phillipson 1976
Kasteelberg E	Western Cape	All	First mill. AD	229	35	-	15.3	KAP
Kasteelberg G	Western Cape	1	First mill. AD	17	2	-	11.8	KAP
Boomplaas	Western Cape	DGL & BLD	First mill. AD	157	17	-	10.8	Klein 1978
Kasteelberg N	Western Cape	All	First mill. AD	210	18	1	9.0	KAP
Atlantic Beach	Western Cape	AB1/3	First mill. AD	463	35	-	7.6	Sealy *et al.* 2004
Kasteelberg A	Western Cape		First mill. AD	3671	268	6	7.5	Klein & Cruz-Uribe 1989
Kasteelberg A	Western Cape	All	First mill. AD	3671	268	6	7.5	Klein & Cruz-Uribe 1989
Die Kelders	Western Cape	1 to 4	First mill. AD	469	29	2	6.6	Schweitzer 1979
Atlantic Beach	Western Cape	AB1/2	No Date	782	42	-	5.4	Sealy *et al.* 2004
Mzinyashana	KwaZulu-Natal	1, 2, 3	Second mill. AD	188	5	5	5.3	Plug 2002
Kreeftebaai	Western Cape	All	Second mill. AD	38	-	2	5.3	Smith *et al.* 1991

TABLE 1 *(continued)*

Site	Location	Layer	Date	Mammals	Ovicaprines	Cattle	% livestock	Reference
Big Elephant Shelter	Namibia	top 4	First mill. AD	38	1	1	5.3	Wadley 1979
Kasteelberg B	Western Cape	Lower	First mill. AD	4985	257	4	5.2	Klein & Cruz-Uribe 1989
Kasteelberg B	Western Cape	Lower	First mill. AD	4985	257	4	5.2	Klein & Cruz-Uribe 1989
Kasteelberg G	Western Cape	4	Third mill. BC	44	2	-	4.5	KAP
Spoegrivier	Western Cape	2	No Date	842	36	-	4.3	Webley 1992
Drie Susters Main	Western Cape	All	First mill. AD	127	3	2	3.9	Smith *et al.* 1991
Tortoise Cave	Western Cape	2b	First mill. AD	326	12	-	3.7	Klein & Cruz-Uribe 1987
Kasteelberg B	Western Cape	Middle	Second mill. AD	9324	309	13	3.5	Klein & Cruz-Uribe 1989
Kasteelberg B	Western Cape	Middle	Second mill. AD	9324	309	13	3.5	Klein & Cruz-Uribe 1989
Spoegrivier	Northern Cape	1	First mill. AD	818	28	-	3.4	Webley 1992
Klein Kliphuis	Western Cape	Upper	First mill. AD	101	3	-	3.0	Van Rijssen 1992
Kasteelberg G	Western Cape	3	Second mill. BC	35	1	-	2.9	KAP
Geduld	Namibia	all	No Date	215	6	-	2.8	Smith & Jacobson 1995
Kasteelberg G	Western Cape	1	First mill. AD	37	1	-	2.7	KAP
Tortoise Cave	Western Cape	2a	First mill. AD	500	10	-	2.0	Klein & Cruz-Uribe 1987
Mzinyashana	KwaZulu-Natal	4	First mill. AD	270	2	3	1.9	Plug 2002
Kasteelberg B	Western Cape	top	Second mill. AD	3563	58	7	1.8	Klein & Cruz-Uribe 1989
Kasteelberg B	Western Cape	Upper	Second mill. AD	3563	58	7	1.8	Klein & Cruz-Uribe 1989
Tortoise Cave	Western Cape	1b	No Date	137	2	-	1.5	Klein & Cruz-Uribe 1987
Mhlawizini Cave	KwaZulu-Natal	1 & 2	Recent	71	1	-	1.4	Mazel 1990
Spoegrivier	Northern Cape	3	First mill. AD	268	3	-	1.1	Webley 1992
Tortoise Cave	Western Cape	3a,b	First mill. AD	197	2	-	1.0	Klein & Cruz-Uribe 1987
Steenbokfontein	Western Cape	2	First mill. BC	115	1	-	0.9	Jerardino & Yates 1996
Elands Bay Cave	Western Cape	2	No Date	443	3	-	0.7	Klein & Cruz-Uribe 1987
Atlantic Beach	Western Cape	AB3/3	Second mill. AD	587	3	-	0.5	Sealy *et al.* 2004
Tortoise Rock Shelter	Western Cape	1a	Second mill. AD	635	3	-	0.5	Klein & Cruz-Uribe 1987

TABLE 1 *(continued)*

Site	Location	Layer	Date	Mammals	Ovicaprines	Cattle	% livestock	Reference
Elands Bay Cave	Western Cape	4	No Date	230	1	-	0.4	Klein & Cruz-Uribe 1987
iNkolimahashi shelter	KwaZulu-Natal	2 & 3	Second mill. AD	301	1	-	0.3	Badenhorst 2003; Mazel 1999
Steenbokfontein	Western Cape	1	First mill. BC	355	1	-	0.3	Jerardino & Yates 1996
Die Kelders	Western Cape	7 to 12	First mill. AD	1502	3	-	0.2	Schweitzer 1979
Elands Bay Cave	Western Cape	1	Second mill. AD	566	1	-	0.2	Klein & Cruz-Uribe 1987
Voelvlei	Western Cape	1 & 2	Second mill. AD	67	-	-	-	Smith *et al*. 1991
Pancho's Kitchen Midden	Western Cape	1	Second mill. AD	189	-	-	-	Jerardino 1998
Elands Bay Open	Western Cape	1	Second mill. AD	166	-	-	-	Klein & Cruz-Uribe 1987
Faraoskop	Western Cape	1	Second mill. AD	88	-	-	-	Manhire 1993
Pancho's Kitchen Midden	Western Cape	2	Second mill. AD	48	-	-	-	Jerardino 1998
Kasteelberg G	Western Cape	Upper	First mill. AD	8	-	-	-	KAP
Renbaan	Western Cape	Bottom	First mill. AD	104	-	-	-	Kaplan 1987
Duiker Eiland	Western Cape	1	First mill. AD	30	-	-	-	Robertshaw 1979
Elands Bay Cave	Western Cape	6	First mill. AD	150	-	-	-	Klein & Cruz-Uribe 1987
Stofbergsfontein	Western Cape	Middle	First mill. AD	32	-	-	-	Robertshaw 1975-77
Kasteelberg G	Western Cape	2	First mill. AD	31	-	-	-	KAP
Witklip	Western Cape	3	First mill. AD	275	-	-	-	Smith *et al*. 1991
Klein Kliphuis	Western Cape	Lower	First mill. AD	290	-	-	-	Van Rijssen 1992
Steenbokfontein	Western Cape	3	First mill. BC	440	-	-	-	Jerardino & Yates 1996
Pancho's Kitchen Midden	Western Cape	3	First mill. BC	42	-	-	-	Jerardino 1998
Pancho's Kitchen Midden	Western Cape	4	Second mill. BC	117	-	-	-	Jerardino 1998
Witklip	Western Cape	4	Second mill. BC	58	-	-	-	Smith *et al*. 1991
Pancho's Kitchen Midden	Western Cape	6	Second mill. BC	108	-	-	-	Jerardino 1998
Elands Bay Cave	Western Cape	3	No Date	171	-	-	-	Klein & Cruz-Uribe 1987

TABLE 1 *(continued)*

Site	Location	Layer	Date	Mammals	Ovicaprines	Cattle	% livestock	Reference
Witklip	Western Cape	2	No Date	30	-	-	-	Smith *et al*. 1991
Pancho's Kitchen Midden	Western Cape	5	No Date	48	-	-	-	Jerardino 1998
Pancho's Kitchen Midden	Western Cape	7	Second mill. BC	249	-	-	-	Jerardino 1998
Faraoskop	Western Cape	2	Fourth & First mill, BC	76	-	-	-	Manhire 1993
Falls Rock Shelter	Namibia	Pottery	First mill. AD	96	-	-	-	Kinahan 2001a
Snake Rock Shelter	Namibia	Pottery	First mill. AD	41	-	-	-	Kinahan 2001a
Fackeltrager	Namibia	I & II	Third mill. BC	67	-	-	-	Richter 1991
Etemba 2	Namibia	ALL	First mill. AD	340	-	-	-	Richter 1991
Austerlitz	Namibia	Upper	Second mill. AD	206	-	-	-	Richter 1991
iNkolimahashi shelter	KwaZulu-Natal	4	First mill. AD	228	-	-	-	Badenhorst 2003; Mazel 1999
iNkolimahashi shelter	KwaZulu-Natal	5	First mill. AD	604	-	-	-	Badenhorst 2003; Mazel 1999
iNkolimahashi shelter	KwaZulu-Natal	6	First mill. AD	262	-	-	-	Badenhorst 2003; Mazel 1999
iNkolimahashi shelter	KwaZulu-Natal	7	Third mill. BC	160	-	-	-	Badenhorst 2003; Mazel 1999
iNkolimahashi shelter	KwaZulu-Natal	8	Fourth mill. BC	182	-	-	-	Badenhorst 2003; Mazel 1999
Mbabane	KwaZulu-Natal	3	Second mill. AD	69	-	-	-	Mazel 1986
Mbabane	KwaZulu-Natal	4&5	First mill. AD	371	-	-	-	Mazel 1986
KwaThwaleyakhe Shelter	KwaZulu-Natal	2	First mill. AD	460	-	-	-	Mazel 1993
Collingham Shelter	KwaZulu-Natal	Upper	First mill. AD	826	-	-	-	Mazel 1992

TABLE 1 *(continued)*

Site	Location	Layer	Date	Mammals	Ovicaprines	Cattle	% livestock	Reference
Collingham Shelter	KwaZulu-Natal	Lower	First mill. AD	1466	-	-	-	Mazel 1992
Clarke's shelter	KwaZulu-Natal	2	First mill. AD	180	-	-	-	Mazel 1984
Clarke's shelter	KwaZulu-Natal	3	First mill. BC	100	-	-	-	Mazel 1984
Mhlawizini Cave	KwaZulu-Natal	4	Second mill. AD	110	-	-	-	Mazel 1990
Mhlawizini Cave	KwaZulu-Natal	5	First mill. BC	336	-	-	-	Mazel 1990
Mhlawizini Cave	KwaZulu-Natal	6	First mill. BC	395	-	-	-	Mazel 1990
Mzinyashana	KwaZulu-Natal	5	First mill. AD	219	-	-	-	Plug 2002
Mzinyashana	KwaZulu-Natal	6,7,8	First mill. BC	382	-	-	-	Plug 2002
Thandwe Rock Shelter	Zambia	all	First mill. AD	55	-	-	-	Phillipson 1976
Makwe RS	Zambia	3	Third & Second mill. BC	55	-	-	-	Phillipson 1976
Kalemba RS	Zambia	S	Second mill. AD	8	-	-	-	Phillipson 1976
Kalemba RS	Zambia	Q	Third mill. BC	6	-	-	-	Phillipson 1976

TABLE 2

Faunal remains from a list of Iron Age sites and site components. The list is arranged from highest to lowest percentage of livestock bones. Some of the publications report minimum numbers of individuals (MNI); most counts are numbers of individual specimens (NISP).

Site	Location	Layer	Date	Mammals	Ovicaprines	Cattle	% livestock	Reference
uMgungundlovu	KwaZulu-Natal	all	Recent	2599	8	2576	99.4	Plug & Roodt 1990
Tavhatshena	Limpopo	T3/3	Second mill. AD	70	21	39	85.7	De Wet-Bronner 1994
Stayt	Limpopo	all	Second mill. AD	230	85	103	81.7	Plug 2000
Tavhatshena	Limpopo	T1/4-5	Second mill. AD	304	46	202	81.6	De Wet-Bronner 1994
Tshirululuni	Limpopo	T1/5-6	Recent	249	14	188	81.1	De Wet-Bronner 1995b
Tshitheme	Limpopo	T1/5-6	Second mill. AD	53	13	29	79.2	De Wet-Bronner 1995a
Mapungubwe	Limpopo	all	Second mill. AD	441	200	142	77.6	Plug 2000
K2	Limpopo	all	Second mill. AD	709	290	226	72.8	Plug 2000
2229AD5	Limpopo	all	Second mill. AD	420	158	117	65.5	Plug 2000
Schroda	Limpopo	all	First mill. AD	710	263	201	65.4	Plug 2000
Mmatshetshele	Northwest	all	Recent	133	37	46	62.4	Pistorius 2001
Millbank	Limpopo	all	Recent	328	87	116	61.9	Van Schalkwyk 2000
Thulamela	Limpopo	all	Second mill. AD	2479	594	916	60.9	Plug 2000
Wildebeestfontein	Mpumalanga	IA midden	Recent	31	7	10	54.8	Plug 1979
Commando Kop	Limpopo	all	First mill. AD	143	46	29	52.4	Plug 2000
Ondini	KwaZulu-Natal	all	Recent	235	24	97	51.5	Watson & Watson 1990
Sentinel Ranch	Limpopo	all	First mill. AD	23	8	3	47.8	Plug 2000
Dzata	Limpopo	T2/1-6	Recent	212	15	85	47.2	De Wet-Bronner 1995a
Pont Drift	Limpopo	all	First mill. AD	380	119	59	46.8	Plug 2000
Icon	Limpopo	all	First mill. AD	86	20	6	30.2	Voigt 1979
Pa8.1	Limpopo	all	First mill. AD	53	16	-	30.2	Plug 2000
Diamant	Limpopo	all	First mill. AD	412	93	24	28.4	Plug 2000
Harmony	Limpopo	all	First mill. AD	307	32	7	12.7	Welbourne 1979
Hapi Pan	Limpopo	all	Recent	38	-	4	10.5	Plug 2000