ABSTRACT. Drawing on a range of archaeological, paleoenvironmental, linguistic, ethnographic, and historical data, this chapter outlines what is currently known about the trajectories of pastoralism in the Ewaso Basin from its initial appearance some 4000 years ago until the early twentieth century, by which time new systems of land use and tenure had been established within the context of British colonial rule. Overall, the evidence indicates that many different groups have occupied parts of this area at different times in the past, and that these have encompassed both hunter-gatherer and pastoralist communities and speakers of various Nilotic, Cushitic, and Bantu languages, among others. There is also good evidence to suggest that the boundaries between different “ethnic,” “subsistence,” and even linguistic groups have been fairly fluid and that cultural intermixing as well as interaction through exchange and other social mechanisms was common. Additionally, at least four broad phases of pastoralist practices can be identified for the period prior to the twentieth century. These phases entailed different forms and levels of mobility, including population migration and seasonal movements, and had diverse environmental consequences, some of which appear to have enhanced biodiversity and ecological resilience whereas others initiated significant changes to the structure of the vegetation mosaic and may have even resulted in localized rangeland degradation.

INTRODUCTION

The primary aim of this article is to outline what is currently known about the trajectories of pastoralism in the Ewaso Basin from its initial appearance some 4,500 years ago until the early twentieth century, to develop a better understanding of the changing nature of different pastoralist societies over this time period. Before considering this evidence in detail, it is worth noting that in contrast to some other areas of East Africa (such as the Central Rift Valley), the Ewaso Basin has not been subject to intensive archaeological research until recently. Consequently, the archaeological record concerning the trajectory of pastoralism is both patchy and partial. Surviving archaeological traces nevertheless include a combination of rock shelters and open sites with surface scatters of flaked stone,
pottery, iron slag, and iron smelting furnaces. Several of the rock shelters also contain rock paintings. The ceramics can be linked to regional archaeological typologies, with occurrences of Pastoral Neolithic (PN) Nderit, Elmenteitan, Marangishu, and Akira ceramic types all being reported, as well as a ceramic tradition known as “Kisima Ware” (Siiriäinen, 1984), which is believed to be associated with post AD 800 Pastoral Iron Age (PIA) communities (Table 1). At least five different types of stone cairn are also known, some of which were definitely used for human burial (Lane et al., 2007). On the basis of oral traditions among different ethnic groups that have a history of utilizing parts of Laikipia and Leroghi plateaus, however, others may have been used as markers for stock routes, as cenotaphs for fallen warriors, as markers associated with captured (or recaptured) cattle, and even simply as meat stores.

The available historical sources indicate that from ca. AD 1750 to the early twentieth century, various pastoral, Maa-language-speaking Iloikop sections (including Laikipiak, Samburu (Burkeneji), Mumonyot, LeUaso, and Purko Maasai communities) coexisted alongside scattered groups of other peoples that included hunter-gatherers (notably, Dikirri Dorobo and Mukogodo); the area probably also included pockets of Oromo-speaking Warra Daaya and possibly Turkana and Rendille along the northern fringes and various Bantu language speakers (including Meru and Kikuyu) along the more southern boundaries (Kenya Land Commission, 1934; Cronk, 1989, 2004; Lamphear, 1993; Sobania, 1993).

In 1904, a large portion of the Laikipia and Leroghi plateaus was designated part of the Northern Maasai Reserve, and in 1911, following pressure from various quarters, a new agreement was signed between Maasai elders and the British East Africa (BEA) protectorate administration, under the terms of which Maasai occupying the Northern Reserve were to be relocated to the Southern Reserve and some 4,500 square miles (approx. 11,655 sq. km) of land handed over to the BEA protectorate for European settlement (Hughes, 2005, 2006). At the time of this move, the Maa-speaking population of Laikipia was estimated to have numbered around 10,000 and was dominated by members of the Purko, Keekonyukie, and Il Dalalekutuk sections, following their defeat of the Laikipiak Maasai (who belonged to a different moiety) during the intersectional Iloikop wars in the 1870s (Weatherby, 1967; Waller, 1979; Sobania, 1993). The bulk of the Maa-speaking population was moved from the designated area between 1911 and 1913, along with up to approximately one million sheep and goats and 175,000 cattle (Hughes, 2006:50), and the area became part of the “White Highlands” set aside for European settlement.

After the First World War, soldier settlement schemes started to bring European settlers to Laikipia, gradually creating an export-oriented economy, with land use strategies being transformed so as to maximize levels of production. Settlement took off in the early 1920s, with the number of settlers in occupation of their farms increasing from 18 in March 1920 to 42 in March 1921. Not

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all the land was immediately taken into productive use, however. Some prospective settlers simply visited but left soon afterward, finding the land either waterless or too stony or bushy for their liking, such that even in 1922, 200 alienated farms still had to be taken up. Even as late as 1937, there were still substantial areas of unoccupied surveyed land in the east of the district (see Waller, 2004, and Vaughan, 2005, for further detail concerning colonial land use history of Laikipia District). With independence in 1963 and a policy of Africanization, several, but not all, Europeans sold their ranches, a number of which were subdivided and settled by small-scale farmers originating in the densely populated Kikuyu areas located south of the district (Carey Jones, 1965; Kohler, 1987). The sale of large-scale commercial ranches to cooperatives and land-buying companies continued at least into the 1990s, and as a consequence, approximately one-third of the original large-scale ranches have now been subdivided. Today, Laikipia District comprises a mosaic of different land use types, including large-scale ranching, small-scale arable farming, traditional pastoralism, and forestry, with ~8.4% under cultivation, mostly concentrated in West Laikipia and around Nanyuki, even though only 1.7% of the district is classified as having high agricultural potential (Huber and Opondo, 1995; Kiteme et al., 1998). These and related events transformed earlier systems of land use and management, replacing them with a largely market-oriented system of production and land tenure, albeit in a piecemeal fashion drawn out over several decades. Pastoralists have nevertheless remained in this landscape and are still a significant presence in some areas of the Ewaso Basin, especially on the Leroghi Plateau. Moreover, when taken together and despite its limitations, the available archaeological evidence provides a good indication of the antiquity of pastoralism in the area, confirmation of a long history of interaction between pastoralist and foraging communities, and a record of continuity and changes in settlement practices, local environments, and material culture traditions, and it is these aspects that are reviewed in detail in the following sections.

**LATER STONE AGE HUNTER-GATHERERS AND THE BEGINNINGS OF PASTORALISM**

The final phase of the Later Stone Age (LSA) in central Kenya dates from ca. 4400 Cal BC to Cal AD 300 and is associated with “Eburran Phase 5” stone tool flaking technologies (Ambrose, 1985) and, in its initial phases at least, with a purely hunting and gathering subsistence economy. Evidence from several excavated rock shelter and cave sites in the Central Rift Valley, most notably the site of Enkapune ya Muto, indicates that these LSA hunter-gatherer groups were fairly mobile populations who exploited a range of medium- to large-sized animals and participated in wide-ranging exchange networks that gave them access to different lithic raw materials, such as obsidian and chert (Ambrose, 1998; Kusimba and Kusimba, 2005). The evidence also suggests that there were different adaptations to highland and lowland environments, with the groups utilizing the former tending to select caves and rock shelters situated close to the boundary between montane forest and grassland habitats, whereas the latter generally occupied open-air sites on the savannas.

Four rock shelter sites on the Laikipia Plateau have thus far been investigated in some detail, and exploratory investigations have been carried out at a sample of other similar locations. Of the four key sites, those at Shulmait and Kakwa Lelash close to Dol Dol in the Mukogodo Hills (see Figure 1 for map) provide long, dated sequences that span terminal phases of the Middle Stone Age (MSA), the subsequent development of the LSA, and the appearance of PN ceramics and stone tool industries. Additionally, the upper levels at Shulmait contained extensive faunal and other evidence concerning more recent transitions from foraging subsistence to pastoralism among Mukogodo (Mutundu, 1999). The earliest horizon at Shulmait is dated to around 45,000 Cal BC and so represents the final phases of the MSA. The MSA horizon is overlain by successive deposits containing microblades and other lithic materials considered typical of the LSA in East Africa, spanning a date range from ca. 40,000 to ca. 3,000 Cal BC toward the upper levels (Dickson and Gang, 2002). There is a gradual increase in the percentage of nonlocal raw materials through the LSA levels. An even more marked increase in the use of chert and obsidian is evident from the excavated LSA levels at the nearby rock shelter of Kakwa Lelash (Kuehn and Dickson, 1999; Gang, 2001; Dickson and Gang, 2002). This increased use of nonlocally available raw materials is generally regarded as evidence for increased patterns of mobility or, at least, the exploitation of larger territories. Similar trends toward greater mobility and more widely ranging exchange networks have been noted for the LSA at sites around Luke-nya Hill in Kenya (Kusimba, 2001) and elsewhere in the region, although the date of this transition is quite variable geographically (Kusimba and Kusimba, 2005). Although there remain some uncertainties with regard to the dating of the sequences at Kakwa Lelash, it is evident that by 20,000 Cal BC, and probably considerably earlier, LSA
hunter-gatherers occupying Laikipia possessed a complex and sophisticated lithic technology, were relatively residentially mobile with extended territories, and were linked with other hunter-gathering groups in the Central Rift by long-distance exchange that provided access to high-quality lithic raw materials (Dickson and Gang, 2002:19–20; Dickson et al., 2004).

Excavations at a limited number of other rock shelters on the Laikipia Plateau by Jacobs (1972a) and more extensive investigations at Porcupine Cave and two other rock shelters (KFR-A4 and A12) on Kisima Ranch by Siiriäinen (1977, 1984) suggest the first appearance of domestic stock in the Ewaso Basin was between 2000 and 1000 Cal BC. These dates are broadly consistent with the current evidence from other parts of the region, which tends to suggest that there was a gradual southward spread characterized by a series of stops and starts, with the transition to generalized, mixed cattle (Bos taurus L.) and caprine (Ovis sp.) pastoralism occurring in some parts of the northern lowlands bordering Lake Turkana by ca. 3800 Cal BC (Barthelme, 1985), by ca. 2000–1400 Cal BC in different parts of highland central, southern, and western Kenya (Robertshaw, 1989; Karega-Müñene, 2002; Marean, 1992; Marshall, 2000), and by ca. 1800 Cal BC in the Tsavo region of southeastern Kenya (Wright, 2005, 2007). By ca. 1000 Cal BC, PN traditions were present across much of eastern Africa.

Archaeological and genetic evidence indicates that the initial introduction of livestock into East Africa was due in part to the southward expansion of small groups of herders from Sudan, Ethiopia, and possibly Somalia (Bower, 1991; Marshall, 2000; Hoelzmann et al., 2001; Hanotte et al., 2002). The diffusion of livestock, knowledge of herding practices, material culture traditions, and technological styles is also likely to have contributed to the southward spread of pastoralist systems of food production and their archaeological signatures. The historical linguistic evidence suggests that these early pastoralists may have been speakers of proto-Southern Cushitic languages (Ehret, 1998). Their southward expansion from the Sahara was probably stimulated (and also facilitated) by the onset of a mid-Holocene dry phase; however, this phase of hyperaridity may have constrained early PN groups to the Lake Turkana Basin until climatic amelioration sometime after ca. Cal AD 0. The uptake farther south was certainly by no means rapid, and many of the earliest dated occurrences of domestic stock come from sites and contexts more closely associated with LSA hunter-gatherers (e.g., Barthelme, 1985; Bower and Chadderdon, 1986; Marean, 1992; Ambrose, 1998). The reasons for this initially slow uptake of herding may have been the relative abundance of wild animals and plants as alternative food sources in many areas and, probably, the spatial distribution of livestock diseases, including trypanosomiasis, foot and mouth, and malignant catarrhal fever, that were endemic to forested areas (Gifford-Gonzalez, 1998, 2000).

It is also important to stress that although the southward spread of pastoralism almost certainly involved some population migration, once herding economies had become established in a particular area, it is highly likely that some of the autochthonous hunter-gatherer communities gained access to livestock and may have ultimately changed their subsistence strategies. This change certainly seems to have been the case in at least some areas of the Ewaso Basin, given that Siiriäinen (1984) found considerable typological continuity in the stone tool assemblages at the sites he excavated spanning levels dated ca. 1000 Cal BC to the twelfth century AD and perhaps even up to the fifteenth century AD. He also found a wide range of different PN pottery types represented at the sites he investigated, with no single type dominating until the emergence of Kisima Ware during the second millennium AD. Both observations would be consistent with a view that the rock shelters were occupied by hunter-gatherer communities that gradually made the transition to food production, although it is possible that PN pastoralists were also utilizing rock shelters, as has been documented in the Central Rift.

The limited information on the faunal assemblages of these sites, which contain a mix of wild and domestic taxa (Siiriäinen, 1984:88), nevertheless indicates that hunting remained an important aspect of the subsistence strategies of these early herding communities. Similarly, at Kakwa Lelash and Shulumai, the upper levels, dated to ca. Cal AD 900 (Gang, 2001:14, 16), contained assemblages of PN and historic pottery associated with worked stone and wild and domestic fauna. Detailed analysis of the faunal remains from this horizon at Shulumai indicates that the assemblage was dominated by remains of wild animals, with a preference for small species such as hyrax, dik-dik, and bushpig, with only small numbers of domestic cattle and sheep or goats (Mutundu, 1999:50–56). Although this pattern of resource use may have been influenced by the ecological conditions in the immediate vicinity of these rock shelters, Mutundu argued that the characteristics of the assemblage are fairly typical of specialized hunter-gatherers with relatively restricted settlement mobility in the process of adopting food production.
The results from recent excavations at Ol Ngoroi rock shelter on Lolldaiga Hills Ranch, undertaken as part of a British Institute in Eastern Africa (BIEA) research project during 2002–2006, lend support to these arguments. Specifically, despite relatively shallow deposits, excavations revealed the presence of domestic livestock remains associated with wild fauna, a microlithic stone tool assemblage on obsidian, and in situ hearth deposits. A charcoal sample from the lowest of these hearths, of which there were seven in all, produced an AMS radiocarbon date of around 2700 Cal BC. Although sheep or goat bones were present, the bulk of the identifiable elements in the faunal assemblage is of wild fauna, and the range of the taxa reflects the structure of the habitats proximal to the site today, with hyraxes and small bovids predominating (Mutundu, 2005). In broad terms, the composition of the assemblage resembles that recovered from the upper levels at Shulumai rock shelter in the Mukogodo Hills, which is known to have been occupied by Mukogodo groups during a period of transition from hunting and gathering to a herding subsistence strategy (Mutundu, 1999). However, until open-air sites associated with diagnostic early PN ceramic and/or lithic assemblages are investigated, the processes whereby the transition to pastoralism occurred across the Ewaso Basin will only be partially understood (as discussed below, locating such sites has been challenging despite systematic survey). It is worth noting here that the Ol Ngoroi shelter, which looks out across the flat plateau land to the west of the Lolldaiga Hills, contains several well-preserved panels of white, geometric rock art (Figure 2). This art is similar in design to that recorded at Lukenya Hill south of Nairobi and is generally attributable to Maasai meat-feasting or initiation rituals (Gramly, 1975; Smith et al., 2004). Several other rock shelters with similar art are known elsewhere in the Ewaso Basin (Chamberlain, 2006), and many appear to have remained important places in the ritual landscapes of Laikipia and Leroghi. The artifactual and faunal remains from

**FIGURE 2.** Example of white geometric pastoralist art, Ol Ngoroi rock shelter, Lolldaiga Ranch, Laikipia Plateau. Photo ©Paul Lane, BIEA.
the upper levels at Ol Ngoroi are consistent with the later use of the site by pastoralist communities and have yielded a date of ca. Cal AD 1260.

**CONSOLIDATION OF PASTORALISM**

Recent judgmental and systematic transect surveys undertaken as part of the BIEA research project between 2002 and 2006 on Lolldaiga Hills, Mugie, and Borana Ranches, supplemented by information collected during rock art surveys on Mpala, Jessels, and Chololo Ranches, have located more than 250 previously unrecorded sites (Lane, In press). More than 50% of these sites are stone cairns or complexes of stone cairns (Figure 3), and another 5% are rock art sites. Of the remaining sites, roughly six times as many (29% compared to 5%) probably date to the PIA compared to those associated with the earlier PN. Although this probably reflects a steady increase in human activity and presence on Laikipia during the second millennium AD, it is also possible that a proportion of the older sites have yet to be detected because they lie buried beneath colluvial and alluvial sediment that has accumulated along valley floors over the millennia. Scatters of PN Elmenteitan and SPN (Savanna Pastoral Neolithic) pottery associated with flaked obsidian and other worked lithic material have recently been reported from Lolldaiga (Causey, 2008:316, 2010) and are also known to occur on Kisima and Mpala Ranches and in the vicinity of Baawa on Leroghi Plateau.

Since these have yet to be dated or intensively investigated, little can be said at present about the later phases of the PN. Far more evidence is available concerning pastoralist activities in the Ewaso Basin during the PIA.

Current evidence suggests that the adoption of iron manufacturing technologies among pastoralist communities of the Central Rift occurred around Cal AD 800–900 (Collett and Robertshaw, 1983). Archeologists term this phase the Pastoral Iron Age. One of the earliest dated occurrences of this transition comes from the Deloraine “main site,” near Rongai to the northwest of Lake Nakuru (Ambrose, 1984). This site contains abundant remains of cattle as well as evidence of cereal processing and the manufacture and use of iron implements. The ceramics may well represent a development of earlier PN Elmenteitan traditions (Sutton, 1993a:123). The ensuing centuries witnessed the consolidation of PIA economies along the Central Rift and adjacent highlands, out of which many of the ethnic identities and linguistic clusters that characterize these areas today were formed.

The BIEA surveys were supplemented by excavations and test excavations at 12 different sites, selected to provide evidence from a range of sites of different ages and dates. Of particular importance to the discussion here of the archaeology of pastoralism in the Ewaso Basin are the results from excavations at the Mili Sita open settlement site in the Lolldaiga Hills and the Maasai Plains site on Mugie Ranch, aspects of which are discussed below. More detailed excavation reports on both sites will be published elsewhere.

**FIGURE 3.** Stone cairn on Mugie Ranch, Laikipia Plateau, prior to excavation. Photo ©Paul Lane, BIEA.
PASTORAL IRON AGE SETTLEMENTS

Both the Mili Sita and Maasai Plains sites are large, open-air pastoralist settlements that contain a pottery type known as Kisima Ware, which has been tentatively associated with the Laikipiak (Siiriäinen, 1984), although whether the Laikipiak made the pottery themselves or they obtained it through exchange with neighboring communities (possibly hunter-gatherer groups) for other products is not clear (see below), and it should not be assumed (rather than demonstrated) that a particular pottery style can be equated in a straightforward manner with ethnicity. Of the two open-air sites thus far excavated, the Maasai Plains site on Mugie is the older one, and on the basis of available radiocarbon dates it was occupied around Cal AD 1400–1480. The site is situated in an area of open grassland surrounded by woody vegetation, about 1.5 km to the west of Loitigon Vlei, which has been sampled for pollen and other environmental remains (Taylor et al., 2005). The Maasai Plains site consists of three concentric and roughly circular arrangements of low ash mounds between ~0.35 and 1.0 m high, covering an area ~750 m in diameter, with a pair of mud wallows, or shallow water-holes, in the center (Figure 4). The mounds, although not

FIGURE 4. Maasai Plains site plan, showing concentric arrangement of low ash mounds, Mugie Ranch, Laikipia. Prepared by Guy Hopkinson and Dave Pinnock from BIEA data.
especially distinctive on the ground, show up as darker patches on vertical aerial photographs and even on moderately low resolution satellite images (see below). Two of the mounds have been examined by excavation, as have some of the level areas between these mounds. The results of these excavations indicate that the mounds comprise a series of interleaved layers of ashy soil, containing pottery and bone fragments and occasional flaked stone artifacts. In terms of the composition of the lithic assemblage, modified blades and outils écaillés dominate, pointing to links with the earlier Elmenteitan, with the main raw materials being obsidian, chert, and quartz. Traces of burnt dung, charcoal, and other organic materials also occur. Preliminary analysis of the faunal remains indicates that the assemblage is dominated by domestic stock (almost equally cattle and small stock), although a few wild fauna are also represented (Kennedy Mutundu, Kenyatta University, personal communication 2006). Sampling for paleobotanical remains was also undertaken at the site, but the results are as yet unavailable. Phytolith evidence recovered from soil samples and charred seed material may help confirm whether crops were cultivated in the vicinity. Isotopic analysis of human remains recovered from burials at Baawa, ~50 km to the north, and also from the single burial thus far recovered at Mili Sita might also indicate whether C₄-based plants, such as millet and sorghum, formed part of their diet (for details of these burials, see Lane et al., 2007; unfortunately, although three cairns at Mugie have been excavated, none have produced any human remains). Moreover, although current rainfall regimes make cultivation in the general vicinity a risky undertaking, slightly higher rainfall, as is documented regionally for the main period of the site’s occupation (see below), could have made farming a viable subsistence strategy.

In terms of their form, composition, stratigraphic structure, and contents, these mounds closely resemble the dung-and-trash heaps commonly observed outside modern Samburu homesteads (nkau’g; in Maa, enkang), formed by the regular cleaning of dung from animal kraals and the discarding of household waste (Figure 5). No house remains have yet been located in the areas between the mounds to confirm this theory, although the presence of low-density mixed artifact and faunal scatters in these areas would be consistent with the kind of debris generated around a living area (Causey, 2008:185–267). The regular patterning of the mounds and the obvious clear area at the center of the site suggest that at a minimum, the mounds making up at least one “ring” were created at the same time, and given the layering in the mounds, each mound was probably built up progressively. The extent of the site is much larger than any other recorded archaeological pastoralist site in the region, and it covers an area even larger than most ethnographically documented Maasai enkang. It is entirely possible, however, that other rings were created at different times and that not all mounds relate to separate houses. It is also possible that the site was only occupied for short periods at a time and was perhaps reoccupied on several occasions; it is even possible that it was used for ceremonial purposes similar to those of ethnographically documented Maasai manayatta, which it resembles in terms of its formal spatial organization.

The Mili Sita site is located on a low col toward the end of a northward-trending ridge in the Lolldaiga Hills, and like the Maasai Plains site, it appears to have been used as

FIGURE 5. Example of a dung midden outside a contemporary Samburu homestead, Laikipia, 2005, which is possibly analogous to the ash mounds at Maasai Plains. Photo ©Paul Lane, BIEA.
an area of pastoralist settlement (Figure 6). On either side of the ridge, gentle to moderate slopes run roughly east and west to alluvial valley floors. At the center of the col is a large grass-covered area (Figure 7) with several discrete concentrations of archaeological material, including later variants of Kisima Ware that are similar but not identical to those from the Maasai Plains site. Some scatters appear to represent the remains of rubbish dumps, whereas others have been shown by excavation to mark the sites of former dwellings or stock enclosures. As at the Maasai Plains site, provisional assessment of the faunal remains indicates a subsistence economy largely orientated to herding cattle and small stock, which is also confirmed by provisional fungal spore data from the site. Interestingly, preliminary analysis of phytoliths recovered from different contexts also indicates that domestic crops were present throughout the occupation of the site, although these never exceed ~20% of the entire phytolith assemblage (Veronica Muiruri, National Museums of Kenya, personal communication, 2009). Additional research on these samples and equivalent material from the Maasai Plains site is ongoing.

About 300 m northeast of this area, on the upper slopes of the ridge, there is a heavily eroded area nearly bare of grass cover and with only a sparse covering of low

acacia thorn trees. Scattered across this area are numerous distinct scatters of iron slag mixed with tuyere fragments and the remains of several smelting furnaces (Iles and Martinón-Torres, 2009). To the south of the main settlement area there are at least 55 stone cairns, one of which has been excavated and has been shown to have been used for human burial (see Lane et al., 2007:43). Close by are two flat stone slabs, each with parallel rows of small ground hollows, similar to known variants of mankala or bao gaming boards. There is also a line of cairns running at right angles to the ridge at its northern end. On the basis of the available radiocarbon dates, the site appears to have been occupied around Cal AD 1640–1730, which on the basis of available oral histories of the region, could suggest an association with the Laikipiak.

**LAIKIPIAK ORIGINS**

One current major uncertainty is precisely when Laikipiak entered the Ewaso ecosystem. Most scholars now consider Laikipiak to have been speakers of an Eastern Nilotic language similar to Maa, although Jacobs (1965:66) initially suggested that they may have been Galla originally, a term generally used to refer to speakers of Eastern Cushitic languages, such as Oromo and Borana. If Siiriäinen’s (1984) association of Kisima Ware pottery with Laikipiak is correct, then on the basis of the available dates for its occurrence on the Maasai Plains site, Laikipiak were already using the plateau by the mid-fifteenth century AD. However, there are various reasons to be cautious about making such a direct correlation between the ceramics and past identities. First, over the last three decades archaeological research across the globe has shown that variations in material culture forms and styles are influenced by a wide range of different factors, and such variations can signal a multitude of different meanings and identities, not just those related to ethnicity (see, e.g., Jones, 1997; Conkey, 2006). Second, it is possible that pots were obtained via exchange with neighboring groups (including Bantu language speakers to the south and the various pockets of hunter-gatherers known to have coexisted with
Maa-speakers on the Laikipia and Leroghi plateaus) for much the same reasons as have been proposed with reference to PIA Sirikwa pottery and the Okiek groups of central Kenya (Blackburn, 1973). Additionally, differences in scholarly opinion over when the first Maa speakers in general arrived in the rift and adjacent highlands further complicate the picture. Arguing from the position of historical linguistics, Sommer and Vossen (1993:25) suggest that the ancestors of modern Maa speakers reached the Rift Valley “by the end of the ninth century” AD, whereas Galaty (1993) has argued that these represent “early Maa speakers” who can be distinguished from “later Maasai,” who represent another expansionary phase of pastoral genesis in the area stretching from Lake Baringo to Lake Natron from which they spread in a spiral fashion (see also Sutton, 1993b). In this model the Laikipiak only attained dominance over the Ewaso Basin around the nineteenth century.

Maasai Purko oral traditions, on the other hand, refer to the Laikipiak arriving from the northeast sometime prior to AD 1600, encountering a group of people (the II Tatua, or Tatoga) already inhabiting Laikipia. According to these traditions, the latter were driven away by the newcomers (Jacobs, 1972b:82). Some support for these Purko traditions is provided by the fact that although the language (Yaaku) originally spoken by Mukogodo hunter-gatherers (who might well be descended from the autochthonous LSA hunter-gatherers on Laikipia) is considered to belong to Eastern Cushitic (Heine, 1974–1975), it also contains Southern Cushitic loanwords (Ehret, 1974). These loanwords could have entered Yaaku as a result of prolonged interaction with a Southern Cushitic population, such as the II Tatua. The evidence from rock shelter excavations at Ol Ngoroi, Shulumai, and possibly Porcupine Cave also supports a model of forager-herder interaction. However, if the Laikipiak did indeed enter the area around AD 1600, one would expect to see a noticeable change in pottery and other artifact styles dating to this period. No such marked changes are evident in the available archaeological data, however, and there is no evidence to support a model of population replacement over this time period. Moreover, although the II Tatua are believed to have been speakers of a proto-Southern Cushitic language (which would be consistent with them being descended from the initial phase of pastoralists entering eastern Africa), it is now generally believed that they lived farther south in the Crater Highlands rather than in the Ewaso Basin. Clearly, further research is required before these issues might be resolved.

Regardless of the precise origins of the Laikipiak, the available historical sources do indicate that from ca. AD 1750 to the early twentieth century pastoral Maa-speaking communities, including Laikipia and Leroghi, coexisted on Laikipia and Leroghi with scattered groups of other peoples that included hunter-gatherers (notably, Dikirri Dorobo and Mukogodo). Furthermore, their communities probably also encompassed pockets of Maa-speaking Mumonyot and LeUaso, Oromo-speaking Warra Daaya, and possibly Rendille along the northern fringes together with various Bantu language speakers, including Meru and Kikuyu, along the southern boundaries (Kenya Land Commission, 1934; Herren, 1987; Cronk, 1989, 2004; Sobania, 1993). These ethnicities were not necessarily permanently fixed entities, and in fact, there seems to have been widespread ethnic shifting among different groups within the region that often corresponded to (or resulted in) changes in subsistence strategy (see, e.g., Galaty, 1982, 1986; Schlee, 1989; Waller and Sobania, 1994:55–63; Cronk, 2002). Individuals, rather than entire communities, may also have shifted identity as a result of marriage or some other reason, as has been well documented elsewhere, including more recently in Isiolo, where individuals of Turkana descent subsequently formed the Ilgira section of the Samburu (Hjort, 1981). It is also known that certain times in the past were politically unstable and were characterized by increased levels of intercommunity violence and warfare, especially during the Iloikop wars of the 1840s–1880s, which resulted in the defeat of the Laikipiak Maasai and the penetration of the area by Purko Maasai (Weatherby, 1967; Waller, 1985; Galaty, 1993; Sobania, 1993). Maasai oral traditions place the defeat of the Laikipiak as having taken place during the last Iloikop war during the time of the Laimer age set (1866–1886) (Jennings, 2005:1130). However, this defeat did not result in the complete disappearance of Laikipiak, as is often commonly believed and was seemingly implied by Joseph Thomson, one of the earliest European explorers in the area. Thomson (1968:243) claimed that following the Purko defeat of Laikipiak, “not a man in the entire land” was left. In fact, many Laikipiak families were absorbed by other neighboring groups, including Turkana (Lamphere, 1993), Il Chamus around Baringo (Little, 1998), Samburu on Leroghi (Bilinda Straight, Western Michigan University, personal communication, 2006), and Meru and Kikuyu to the south (Waller, 1985); others temporarily became “Dorobo” or Mukogodo hunter-gatherers, and others still were assimilated into the Purko (Hughes, 2005). The oral traditions of various groups to the north of Laikipia, including those of Rendille, Turkana, Borana, and Samburu, also attest to a continuing presence of Laikipiak as a distinct entity—as exemplified by numerous
cattle raids—until at least the last decade of the nineteenth century (Sobania, 1993).

Various external events and historical processes are also known to have had repercussions within northern “Maasailand,” such as the southward expansion of the Boran into areas around Marsabit, the extension of Somali territory to include Wajir and sections of the Tana River emanating from the rise of Ethiopian imperialism during the nineteenth century (Fratkin, 2001), and Turkana incursions into the Samburu grasslands after ca. AD 1900 (Lamphear, 1993). Moreover, from the mid-nineteenth century there was a significant expansion of the caravan trade in the region, fed partly by an increase in demand in Europe and North America for ivory, encouraging greater penetration of the interior by traders, hunters, and porters from the Swahili coast and the Bantu-speaking heartlands. The large-scale removal of elephants from the Ewaso Basin as a consequence of this expansion could have also had major ecological consequences, at least over the short term, and potentially much longer (Håkansson, 2004). The East African region was also heavily impacted by a combination of epizootics, famine, and epidemics in the latter part of the nineteenth century, which included widespread famine between 1890 and 1891, smallpox outbreaks during 1883–1890, and rinderpest and bovine pleuropneumonia in the 1880s. These events are likely to have had significant repercussions for local demography and economic productivity (Kjekshus, 1977), as did the enclosure of commons, the restructuring of the tenets of landownership and property, and changes in the approaches to disease control that accompanied the establishment of British colonial rule (Waller, 2004).

**EVIDENCE FOR HUMAN-INDUCED ENVIRONMENTAL CHANGE**

In common with other parts of the region, the vegetation of the Ewaso Basin has undergone considerable change during the last 5,000–6,000 years. The main shift has been from dry evergreen upland forest dominated by cedar (*Juniperus procera*) and African olive (*Olea africana*), which still survives in some areas, to savanna vegetation communities of various types. Evidence for these changes is provided by the results from recent paleoenvironmental investigations of swamp soils and sediments at Loitigon vlei on Mugie Ranch in the northern part of Laikipia and research on sediment cores collected from Ewaso Narok swamp just north of Rumuruti and Marura Swamp along the Mutara River adjacent to Ol’Pejeta Ranch (Muiruri, 2008). The data from Loitigon vlei, for example, suggest that there was a marked decline in the extent of Afromontane forest in the catchment at around 100 Cal BC and that this decline coincided with a pulse of biomass fires, as evidenced by an abundance of large-sized fragments of charcoal in the sediments (Taylor et al., 2005). At Marura, there is limited evidence for vegetation disturbance at the base of the record dated to around Cal 200 BC. Fossil pollen at this level is overwhelmingly from montane rainforest taxa (such as *Podocarpus*, *Olea*, and *Juniperus*, with scattered secondary species that included *Croton*, *Rapanea*, and *Cyathea*), suggesting a densely wooded environment. This conclusion is further supported by the presence of fungal spores associated with forest conditions (such as *Trichoglossum* cf. *hirsutum* and *Glomus* sp.) at these levels. Microscopic charcoal is also relatively scarce, suggesting a low incidence of fires. From ca. Cal AD 300, there is a marked decline in montane forest taxa and a corresponding increased abundance of Poaceae. An increase in forest fires is also indicated by the dramatic rise in the overall amount of charcoal and by the size of fragments, suggesting that fires were locally abundant (Muiruri, 2008).

Paleoclimatic factors such as drought cannot be fully ruled out as several of the larger lakes in the region experienced low-stands around this time, e.g., Lake Tanganyika, ca. 200 Cal BC (Alin and Cohen, 2003); Lake Edward, ca. Cal AD 0 (Russell et al., 2003); and Lake Victoria, ca. 700–500 Cal BC (Stager et al., 2003). Nevertheless, these changes on Laikipia seem more likely to have been related to an expansion of herding and human-induced bush clearance, especially as evidence from nearby Mount Kenya indicates that the period from ca. 900 Cal BC to Cal AD 100 was one of heavy convective rainfall, enhanced soil erosion, neoglacial ice advances, and forest expansion, rather than contraction, as documented on Laikipia (Barker et al., 2001). Further increases in burning are implied by an increased abundance of the largest-sized fraction of charcoal in the Loitigon sediments from ca. Cal AD 300 to 1300, and according to the pollen and $d^{13}C_{\text{bulk}}$ data, the *Acacia* bushland was replaced by fire-adapted *C_{4}* grassland. Rather similar trends are evident in the Marura and Ewaso Narok cores, which document a steady replacement of Afromontane vegetation by woodland and bushland taxa (including *Capparis*, *Acacia*, and *Grewia*), indicative of open disturbed savannah becoming widely established in these catchments between ca. Cal AD 300 and 850. There is also a marked rise in the proportions of the spores of the dung-colonizing fungi *Cercophora* after Cal AD 1300 in these cores. This rise is probably indicative...
of an increase in the overall numbers of herbivores (which could include domestic stock), as might be expected following a shift to more open habitats (Muiruri, 2008).

When taken together, the changes in vegetation structure, increased evidence for local as well as regional fires, and the fungal spore evidence suggest that the period between ca. 200 Cal BC and Cal AD 300 (coinciding with the later stages of the PN) witnessed a marked expansion of human activity on Laikipia that included widespread forest clearance through the use of fires aimed at improving and extending grazing. This interpretation is only partially consistent with the available archaeological data since only limited traces of PN activity have been documented thus far. This apparent gap in the archaeological record may be due more to the limited extent and specific geographical distribution of archaeological research and/or various taphonomic processes that have either buried or eroded PN sites, than to a genuine absence of pastoralist activity in the Ewaso Basin at this time. However, it must be noted that the first few centuries AD were a period of considerable climatic variability across the region and especially increased unpredictability of rainfall (Alin and Cohen, 2003). Thus, settlements may have been more transient as pastoralist groups became more mobile and populations dispersed during the dry-season months. It is interesting to note, nonetheless, that the apparent date of occupation of the Maasai Plains site at around Cal AD 1400 coincides with evidence from Lake Naivasha for a brief high-stand, possibly indicative of a period of increased precipitation (Verschuren et al., 2000; Lamb et al., 2003), which could have facilitated a phase of settlement and population aggregation across the Ewaso Basin.

High-resolution environmental records from various locations throughout the region also indicate that the period from the late AD 1500s through the late 1700s appears to have been characterized by long intervals when levels of effective precipitation in eastern Africa were much reduced relative to the present (Taylor et al., 2000; Verschuren et al., 2000; Alin and Cohen, 2003; Robertshaw et al., 2004). Yet as the records from Lake Naivasha and elsewhere indicate, against this general drying trend there were periodic wet episodes interspersed with periods of very low rainfall and ensuing drought, some of which are remembered in various local oral traditions. It is also clear from the most recent work that there have been several massive, supraregional droughts within the last millennium (Verschuren et al., 2000; Verschuren, 2004; Holmgren and Öberg, 2006). Of these, an interdecadal drought dated to ca. Cal AD 1760–1840 (Bessem et al., 2008), which Verschuren et al. (2000) describe as much more serious than any of the twentieth century droughts, may have been particularly instrumental in triggering a variety of economic and settlement changes. Among other things, this severe climate event led to the complete desiccation of Lakes Baringo and Nakuru (Verschuren et al., 2000; Kiage and Liu, 2009) and had profound consequences for vegetation (Lamb et al., 2003; Bessem et al., 2008).

Nevertheless, paleoecological evidence from the same area also suggests that swamp formation around Lakes Baringo and Bogoria was both extensive and rapid during wetter climatic phases, with relatively abrupt shifts between C₃ dry scrubland (mixed warm-season grasses and Acacia) and C₄ wetland (dominated by Typha) vegetation mosaics (Driese et al., 2004). Moreover, it has been shown that droughts and other climate-induced stresses were not experienced uniformly across the region (Russell et al., 2007). There is also plentiful geomorphological evidence to suggest that rainfall regimes have fluctuated widely across the Ewaso Basin over the millennia. In commenting on the results of recent surveys in the Kipsing and Tol River watersheds in the Mukogodo Hills area immediately north of Lolldaiga, Pearl and Dickson (2004) noted that archaeological site distributions in these areas have been heavily affected by erosion and often reburied beneath recent alluvia. In all, Pearl and Dickson identified five stratigraphic units in this area, which related to different depositional events dated to between ca. 35,000 Cal BC and Cal AD 1550. Of particular interest is the evidence for a major episode of floodplain aggradation after ca. 6500 Cal BC and the subsequent formation of a paleosol near the top of the sequence under cooler and moister conditions than prevail today around Cal AD 600. After a period of relative stability, erosion resumed during the last 400–500 years (Pearl and Dickson, 2004:571–576).

Whether this erosion was induced by grazing pressure generally across Laikipia and Leroghi has yet to be established. Nevertheless, preliminary evidence from around the Mili Sita site in the Lolldaiga Hills suggests that there was a phase of severe soil erosion here before and/or concurrent with the use the site around Cal AD 1640, which would imply that overgrazing and/or the creation of deep drove ways by frequent cattle movements may have contributed to severe degradation in at least some catchments. Elsewhere, in contrast, pastoralist activities also had major beneficial effects on the transfer and local concentration of soil nutrients, with long-term consequences for vegetation patterns. An example is at the Maasai Plains site on Mugie, where concentrated pastoralist activity has resulted in the formation of stable, less-erodible, and fertile soils, with a number of possible positive consequences for local
wildlife populations resulting from the formation of long-lived grassland glades within the wider mosaics of *Acacia*-dominated low-tree and shrub savanna and bushland.

More specifically, glades are a common feature of African savanna environments, and researchers from several disciplines have sought to understand their origin and dynamics, both from an ecological perspective and in relation to the implications for environmental management (e.g., Dublin et al., 1990; Reid and Ellis, 1995; Young et al., 1995; Augustine, 2003; Augustine and McNaughton, 2004a). This ecological research has confirmed that some glades represent nutrient-enriched patches related to abandoned pastoralist enclosure settlements (“bomas”) that become dominated by nutrient-rich grass species that are particularly palatable to wild grazing ungulates and also enhance local biodiversity more generally. On parts of Laikipia glades have been shown to be dominated by *Cynodon plectostachyus* and the annual forb *Tribulus terrestris* (Augustine and McNaughton, 2004b:831), whereas on the Athi Plains in southern Kenya, *Cynodon nlemfuensis* is the dominant grass (Stelfox, 1986). In the Amboseli Basin, Kenya, longitudinal study of abandoned bomas has indicated that recolonization of these sites by different plant species tends to follow a distinct sequence, culminating in the overall dominance of *Acacia tortilis* (Muchiru et al., 2008, 2009). Glades are perpetuated in the landscape by browsing and grazing activities that act to suppress the invasion of tree and shrub seedlings, and different studies have shown that glades may survive for periods up to at least 100 years. Numerous factors, including changes in management regime, climate change, fire history, periodic fluctuations in herbivore populations, and the effects of large herbivores such as elephants and giraffes, are known to influence the ecology of glades, and it is likely that different glades have had quite different histories.

Comparison between the Mili Sita and Maasai Plains archaeological sites lends support to such an argument but also indicates that some glades may be much older than currently estimated. Specifically, both sites survive in the landscape today as distinct areas of open grassland, against a broader context of expanding bushland, and both exhibit signs of intensive use for human settlement by pastoralist communities. The Maasai Plains site on Mugie Ranch dates to around Cal AD 1450 and is ~200–250 years older than the Mili Sita site. This site is surrounded by *Acacia*-dominated low-tree and shrub savanna on relatively fertile Chromic Luvisols that exhibit little evidence of soil erosion. Analysis of time series aerial photography and satellite imagery of several glades on Mugie Ranch indicates that changes in their spatial extent since 1950 (the date of the earliest available aerial photograph coverage) have been variable and that bush encroachment has been influenced by a range of anthropogenic and natural processes (Causey, 2008:157–184). Surveys of a sample of these indicate that some but not all of the existing glades contain traces of archaeological material indicative of former pastoralist settlement activity, although the cultural and temporal attributions of this material were variable (Causey, 2008). Of all the glades studied, the greatest decrease in open area was at the Maasai Plains site (31.7% since 1950). Nevertheless, the glade has continued to persist within this landscape as a nutrient “hot spot” that originated directly as a consequence of pastoralist activity some 750 years ago.

The soils around Mili Sita on Lolldaiga Hills Ranch are also Chromic Luvisols, but unlike those in the vicinity of the Maasai Plains site, they are rarely more than 40 cm in depth, usually lack a well-developed A horizon, and frequently have been stripped, leaving only quartz lag deposits. All soils across the col and down the flanks show signs of having been severely eroded in the past, despite the lack of steep rocky slopes that could have generated significant runoff during heavy rainstorms. Both sides of the ridge to the south of Mili Sita are cut by substantial erosion gullies that are in places well over 6 m deep. In light of this evidence for erosion, the persistence of a large expanse of grassland across the col is probably due to the effects of the presence of pastoralist settlement here over a significant period of time. Soil test pits excavated along transects across the col seem to confirm this, as the results showed that the soil here had higher organic carbon levels than the truncated Chromic Luvisols around the Mili Sita ridge (see Payton, 2005). The soil pH was also always neutral and supported by elevated base saturation measurements of 100% and strong enrichment of exchangeable calcium and exchangeable potassium. Both factors lend support to the hypothesis that the soils have been enriched even though their morphology and physical characteristics indicate that the col had been severely eroded prior to settlement and the use of the area for penning livestock in the seventeenth century AD. Whether there were earlier phases of settlement on Mili Sita that might have initiated this erosion or whether it arose from climate change (the period from ca. Cal AD 1250 to the late 1500s, for instance, is believed to have been characterized across the region by relatively humid conditions; see Alin and Cohen, 2003) or a combination of factors remains to be established. Nevertheless, it would still appear that although overgrazing might have contributed to severe degradation in the surrounding catchment, pastoralist activities...
also had a major effect on the transfer and local concentration of soil nutrients in the degraded soils on the Mili Sita ridge, with long-term consequences for vegetation patterns. In contrast to the situation at Mili Sita, at the Maasai Plains site on Mugie the contrasting environment of the phonolite plateau has resulted in the formation of more-stable, less-erodible, and more-fertile soils located in a landscape of low relief. Even with similar land use and grazing pressures to those at Mili Sita, these soils would probably resist soil erosion.

Elsewhere on Lolldaiga, Causey’s research has shown that the majority of PIA sites located during the BIEA transect surveys fell within open grassy glades and typically on sloping ridge tops (Causey and Lane, 2005), indicating a settlement location preference similar to what has been recorded among contemporary Maa speakers (e.g., Western and Dunne, 1979), although some settlement activity in the valley floors and open plains also took place. Causey’s transect surveys of the lowlands toward the northern end of the ranch, however, found much more evidence for PN activity than encountered during the BIEA surveys. These sites are all smaller in extent than the later PIA examples and occur on slightly sloping ridge tops, but their distribution does not correlate closely with the distribution of open glades (Causey, 2008:294–311, 2010).

In summary, these provisional results suggest that the patterns of soil erosion and deposition and bush encroachment are highly variable in space and time. Further, and of greater significance to contemporary environmental narratives, these results also suggest that pastoralist activity, although a cause of land degradation under some circumstances, can have the potential to encourage local stabilization and a reversal of degradation processes even in those areas where it had acted previously as a catalyst for erosion. In other words, the links between grazing patterns, herd sizes, range quality, and soil erosion appear more complicated than is implied by many current environmental narratives, whether these see pastoralists as the root cause of land degradation and biodiversity loss or as the traditional guardians of an Edenic wilderness. Far more integrated cross-disciplinary research on this topic is, nevertheless, needed to clarify certain human–environment relationships.

SUMMARY

Archaeological, historical, and ethnographic information concerning the Ewaso Basin indicate that many different groups have occupied parts of this area at different times in the past and that these groups have encompassed both hunter-gatherer and pastoralist communities and speakers of various Nilotic, Cushitic, and Bantu languages, and possibly others as well. There is also good evidence to suggest that at least in the recent past, the boundaries between different “ethnic,” “subsistence,” and perhaps even linguistic groups were fairly fluid and that cultural intermixing as well as interaction through exchange and other social mechanisms was common. All of these factors make it likely that the archaeological traces that survive in the landscape were the product of multiple social groups at different times in the past, with multiple meanings and social significance. Similarly, the available data caution against making simplistic correlations between, for example, a particular cairn or artifact type and either the linguistic or ethnic affiliation of their makers. Problems with dating and uneven preservation further complicate the interpretation of this evidence.

However, on the basis of the combined results of recent work on Laikipia taken together with the broader regional evidence and with the proviso that elements of the sequence and specific details may change as more research is completed, four broad phases of pastoralist practices in the Ewaso Basin can be proposed for the period prior to the establishment of colonial rule, spanning the last ~4000 years. The first three of these are still rather speculative and need to be tested by further research; the evidence for the last phase, however, is more comprehensive. The proposed phases are as follows:

1. An initial “moving frontier” of pastoralism ca. 2700–1000 Cal BC.
2. The formation of a “static frontier” and emergence of specialized pastoralism ca. 1000 Cal BC to Cal AD 100.
3. A shift to more mixed herding-hunting economies and fluid ethnic boundaries ca. Cal AD 100–800.
4. The reappearance of specialized pastoralism and the creation of Maa identities ca. Cal AD 800–1900.

These phases entailed different forms and levels of mobility that at times may have incorporated both population migration and seasonal movements and perhaps even genuine nomadism. At others times, such as between ca. 2000 BC and AD 100, the patterns of mobility may have been characterized more by a system of seasonal transhumance between relatively clearly defined and stable territories. It is also evident that the boundaries between “pastoralists” and nonpastoralists, including both hunter-gatherers and agriculturalists, have at times been more fluid and negotiable than at others, and hence “identity” mobility and not...
just spatial mobility was at times constrained and at others much less restricted. Other processes and events also acted to stimulate or reduce mobility, all of which would have had rather different effects on local environments and vegetation mosaics.

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Notes

1. Owing to fluctuations in the ratio of $^{14}C$ to $^{12}C$ in the atmosphere over the millennia, largely as a result of changes in the solar magnetic field, “raw” radiocarbon dates do not correspond directly with calendar years. These raw dates can be calibrated by using calibration curves produced by systematic dating of materials of known absolute date (such as tree rings), and comparing the differences between the actual calendar age of the material and its radiocarbon age. Whereas raw radiocarbon dates are conventionally reported in “radiocarbon years BP,” calibrated dates are reported in calendar years in the form Cal BC or AD.

2. Although increased aridity in parts of Ethiopia and Sudan may have made these areas more marginal for pastoralism, it would have had the reverse effect in, for example, the Central Rift Valley, where reduction in rainfall and a fall in lake levels would have encouraged the retreat of forest margins to higher altitudes, allowing the expansion of grasslands more suited to grazing (Ambrose and Sikes, 1991; Marean, 1992).

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