

## TANZANIA

### New archaeological sites in the Manonga Valley, north-central Tanzania

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## Introduction

Since 1990, an international team of geologists and paleontologists has been exploring fossil sites in the late Miocene-early Pliocene lake basin in the Manonga Valley of north-central Tanzania. During the course of these investigations a number of archaeological occurrences have also been recorded. Generally, these consist of scatters of Late Stone Age (LSA) artifacts, associated with large mammal remains, that are exposed by erosion of the mbuga clays that cover the floor of the valley. Unfortunately, the low densities of artifacts and bones, and the disturbed nature of their geological contexts, limit the potential of these occurrences to yield informative archaeological data. However, in July 1996 an archaeological locality was discovered at Kalangale Hill, and preliminary observations suggest that the site may merit further investigation. Analysis of materials recovered from the surface indicates that the site was occupied by a Pastoral Neolithic community with an unusual mixed economy based on domesticated livestock, wild large mammals, and the exploitation of giant

land snails. The aim of this report is to place the site of Kalangale Hill on record (since this is the first archaeological site to be documented in the Manonga Valley), and to present a brief assessment of its archaeological significance. It is hoped that the initiation of full-scale excavations at Kalangale Hill will help to document the poorly known prehistoric record of the region, and may provide important clues to understanding the ecological and geographical factors that impacted on early pastoralists as they established themselves in East Africa after 4,000 B.P.

## Geological and modern geographical setting

The Manonga valley is located just south of the Serengeti Plains at the southwestern end of the Gregory Rift Valley. The series of sediments exposed in the Manonga Valley were laid down in a large lake basin during the late Miocene and early Pliocene, and these deposits have yielded an extensive fauna (see Harrison 1997). With the development of the Eyasi-Wembere grabens during the early Pliocene, Lake Manonga drained into the Eyasi trough, thereby initiating the modern-day Manonga River system which flows eastwards into Lake Kitangiri. The Neogene beds are overlain by alluvial sands, yellow clays, and dark grey mbuga clays, which accumulated during the late Pleistocene and Holocene (Harrison and Mbago 1997). These latter sediments have yielded LSA assemblages.

In the center of the basin, the Manonga Valley is between 10 and 20 km wide, and is bordered to the north and south by low cliffs and slopes up to 30 m in height. The general area has a low relief, ranging in elevation from 1000 m to 1200 m above sea level. Small hills formed from the eroded remnants of Precambrian inselbergs produce a gently undulating terrain (Harrison and Mbago 1997). The region is hot and dry, with unreliable rainfall (with an average annual precipitation of less than 800 mm). During the dry season (June to November) ephemeral streams and rivers, including the Manonga River, are completely dry. The vegetation is predominantly thornbush and grasslands. Towards the eastern margin of the basin, where the Manonga Valley grades into the Eyasi-Wembere depression, a flat, treeless expanse of grasslands occurs, representing the

southernmost extension of the Serengeti Plains (Harrison and Mbago 1997). The western portion of the Manonga basin is dominated by miombo woodlands. Evidence suggests that woodland habitats were more widespread in the recent past, and that rapid population growth and tsetse fly control have led to extensive clearance over the past 60 years (Rodgers 1996; Harrison and Mbago 1997). The Manonga Valley is largely populated today by the Wasukuma, the largest tribal group in Tanzania, who are agriculturalists and cattle herders.

**Archaeological occurrences in the Manonga Valley**

The mbuga clays that cover the floor of the Manonga Valley have yielded LSA artifacts. These consist of microlithic scrapers and flakes made primarily from locally available quartz. Similar artifacts derived from chert and gray-green obsidian are also found, but these are much rarer. The lithic assemblages are associated with a mammalian fauna that consists almost entirely of species that are extant today in northern Tanzania (Table 1). The only possible exception is *Megalotragus*, a large

alcelaphine bovid that became extinct during the late Pleistocene (Harrison and Baker 1997). A similar mammalian fauna to that from the mbuga clays has been recovered from a yellow clay horizon unconformably capping the Neogene beds along the northern margin of the valley. The stratigraphic relationship between the yellow clay horizon and the mbuga clays is unclear, but the former probably predates the latter (Harrison and Baker 1997). No artifacts have been recovered from the yellow clays, but evidence of butchering marks on large mammal bones clearly indicates that the faunal assemblages are associated with human activity.

Unfortunately, no radiocarbon dates are available for these horizons. However, deposition of the mbuga clays may coincide with a warm and wet climatic phase (12,700-11,100 B.P.), during which Lake Victoria overspilled into the Manonga Valley to form a vast network of swamps and shallow lakes that extended across much of northern Tanzania (Harrison and Mbago 1997). The low density of LSA artifacts and associated faunal remains, as well as the disturbed nature of their geological contexts, limit the archaeological potential of these occurrences. They do, however, serve to document (for

**Table 1.** Mammalian species recovered from the mbuga clay and yellow clay horizons (after Harrison and Baker 1997).

Family	Species
Bovidae	<i>Connochaetes taurinus</i> <i>Damaliscus dorcus</i> <i>Taurotragus oryx</i> <i>Alcelaphus buselaphus</i> <i>Syncerus caffer</i> <i>Megalotragus</i> sp.
Hippopotamidae	<i>Hippopotamus amphibius</i>
Equidae	<i>Equus burchelli</i>
Suidae	<i>Phacochoerus africanus</i>
Elephantidae	<i>Loxodonta africana</i>
Hominidae	<i>Homo sapiens</i>

the first time) that the Manonga Valley was occupied by LSA hunter-gatherers during the Holocene. In fact, an earlier occupation of the region is indicated by the occurrence of Middle Stone Age (MSA) artifacts from the Songeli River, located south of the Manonga Valley, in the Wembere drainage basin. The river gravels contain irregular blocks of chert, variable in coloration, but generally bright orange, brick red, white, or gray-green. Small hand axes (10-14 cm in length), bifacial points, and large flakes struck from prepared cores, all derived from this chert, are commonly found along the river bed.

### Kalangale Hill

While prospecting in the vicinity of the village of Kiloleli (Figure 1), a local inhabitant informed members of the expedition that he knew the location of a site where animal bones were particularly abundant. He told us that the site is visited regularly by villagers from Kiloleli to extract clay for making bricks used in the construction of local houses. The clay from this locality is much preferred over that from other local sources because the bricks produced are more durable. The informant took us to a location 7 km to the northwest of Kiloleli called Kalangale Hill (HhIw-12; 33°40'E-3°49'S). Kalangale is a commonly used place name in the area because such hills are associated (at least formerly) with a type of tree that bears this name in Kisukuma. The site is a low-lying hillock, formed from a remnant of the Precambrian, that reaches an elevation of no more than 10 m above the floor of the valley. The flanks of the hill are littered with large angular cobbles derived from the underlying Precambrian, and covered with a thin layer of red soil that supports a sparse vegetation of grass and thornbush. The crown of the hill is more densely vegetated with bushes and tall grass, while a mature hedge of euphorbia along the north-eastern edge of the hill is evidence of a prior homestead. Our informant told us that a farm had indeed occupied the hill, probably until the 1960s, when it was abandoned because of the local belief that the occurrence of so many bones at the location was inauspicious.

Capping the hill is a layer of dark grey sediment used by the local people for brick-making. A number of pits (up to 1 m in depth) has been dug into the superficial layer, such that the original con-

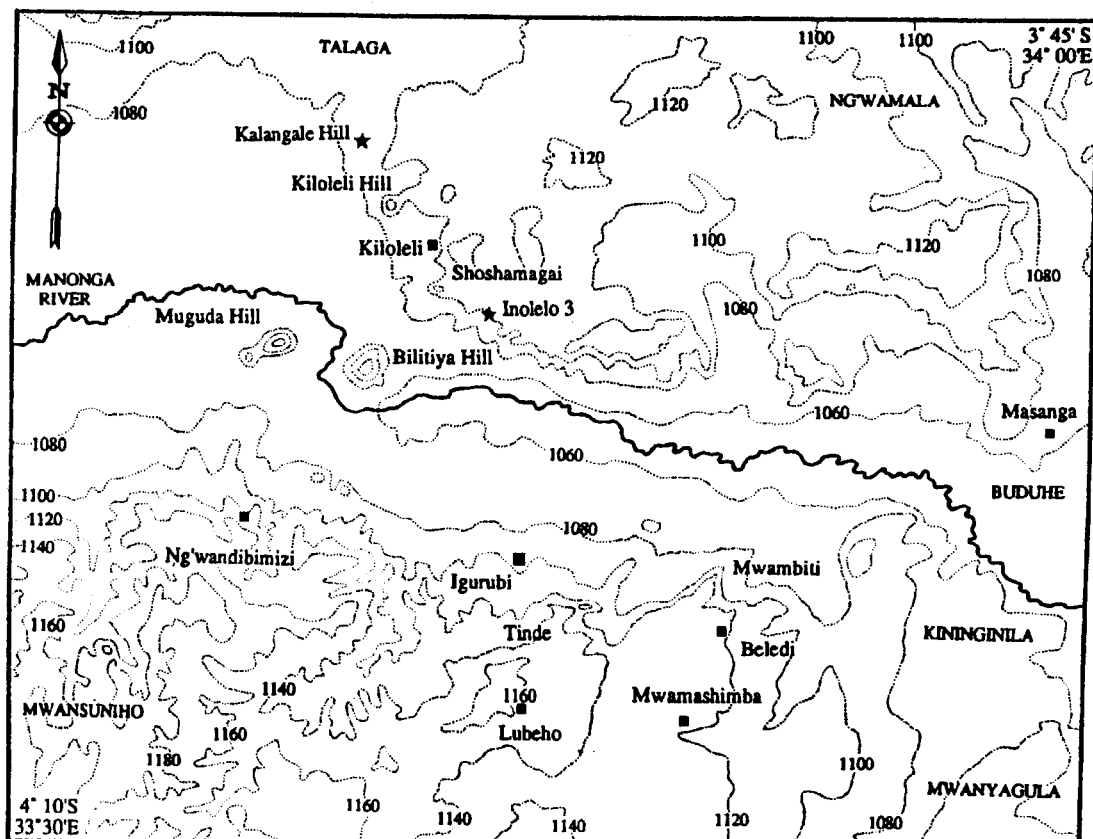
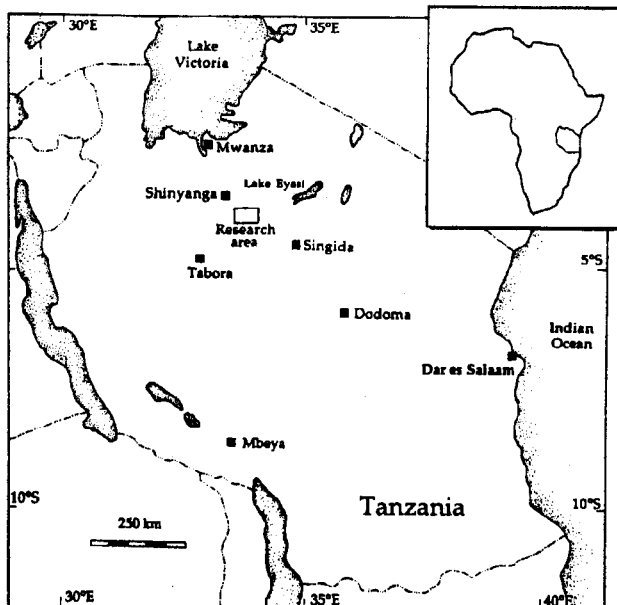
text of the center of the site has been much disturbed. These excavations have exposed numerous bones and isolated teeth of large mammals, as well as extensive middens. The latter comprise dense concentrations of shells of the giant African land snail, *Achatina* sp., as well as those of smaller terrestrial gastropods, such as *Limicolaria*, and freshwater bivalve mollusks. Time constraints did not permit us to conduct trial excavations, but a representative sample of archaeological and faunal materials was recovered from the surface. From these collections it is possible to make a number of preliminary observations about the nature and context of the site.

Stone tools are common, consisting of small cores, flakes and scrapers of quartz, which are typical of LSA assemblages. Larger flakes derived from the underlying and surrounding country rock are also present, but it is uncertain whether these represent tools or incidental occurrences. All of the pottery sherds located on the surface were very fragmentary, and since none was decorated, the pottery cannot be attributed to a particular ware type.

The fauna is especially interesting. A preliminary analysis of the cranio-dental material indicates that the remains belong to both domesticated and wild ungulates. Teeth and limb bones of cattle are the most common. Comparisons of the Kalangale Hill specimens with modern local zebu cattle provides a good correspondence in terms of size and morphology, while the teeth are generally smaller than those of the wild African buffalo, *Syncerus caffer*. In addition, a few fragmentary specimens of small bovids are provisionally identified as caprines. Although domestic livestock appears to have predominated at Kalangale Hill, the remains of wild ungulates are also common, especially those of zebras (*Equus* cf. *burchelli*). In addition, a small fragment of an elephant molar (*Loxodonta africana*) and several pieces of ostrich egg shell were recovered.

The dense concentrations of mollusk shells at Kalangale Hill indicate that giant land snails were used as an important food source, at least on a seasonal basis. These snails aestivate below ground during the dry season (June to November), but become active again at the onset of the rainy season in January. Such extensive exploitation of land snails is almost unprecedented in the archaeological record of East Africa. The only other archaeological site where shell middens of land snails are known to

**Figure 1:** Location of research area in northcentral Tanzania (top) and detail of research area showing the location of Kalangale Hill and Inolelo 3 (bottom).



occur is at Mumba-Höhle, near Lake Eyasi in northern Tanzania, more than 200 km east of Kalangale Hill (Mehlman 1977). At Mumba, the beds containing the shell middens (Beds III and V) are associated with pottery and quartz artifacts similar to those from Kalangale Hill, but there is no evidence of domesticated animals (Lehmann 1957). Radiocarbon dating on charcoal and bone from Bed III at Mumba has provided dates of  $4,860 \pm 100$  BP and  $4,890 \pm 190$  BP respectively, and Bed IV probably antedates 12,000 BP based on correlations of lake levels during the Holocene (Mehlman 1977). Thus, the shell middens at Kalangale Hill are probably considerably younger than those at Mumba, where the occurrence of domesticated livestock indicates an age of less than 4,000 BP (Collett and Robertshaw 1983). Similarly, Kalangale Hill post-dates the famous *escargotières* associated with Capsian hunter-gatherers in Algeria, dated at 6,500-10,000 BP (Lubell et al. 1976).

Land snails are not included in the diet of the Sukuma agriculturalists who live in the area of Kalangale Hill today, although we have observed that they do accumulate the shells at locations where ritual slaughter of livestock is performed to ensure good rains and productive harvests. The empty shells are apparently used as containers for votives or magical potions, although, as harbingers of the onset of the rainy season, land snails may have special symbolic significance. However, the abundance of shells at Kalangale Hill clearly indicates that snails were being exploited as an important food source, rather than being used as ritual items. The Hadza, modern-day huntergatherers that live around the southern shore of Lake Eyasi, are known to collect and eat land snails, and to leave dense surface accumulations of their shells in rock shelters (Kohl-Larsen 1958; Mehlman 1977). Although the available evidence is limited, it would appear that there is a local tradition of seasonal exploitation of land snails by hunter-gathers in the Eyasi region that extends back to more than 12,000 BP.

The faunal and cultural evidence would suggest, therefore, that Kalangale Hill was occupied by a Pastoral Neolithic community whose economy was based primarily on the exploitation of domesticated livestock. The sediments are consistent with this interpretation, since they appear to represent a layer of decomposed dung, probably derived from livestock confined to an enclosure on top of the

hill. If confirmed, this would support the inference that the location was used principally as a site of animal husbandry, rather than as a butchering site or as an occupation site used by huntergatherers who occasionally acquired livestock through trade with neighboring pastoralist communities.

Pastoral Neolithic assemblages with the remains of non-domesticated animals are extremely rare in the archaeological record of East Africa, although similar associations have been reported at sites such as Gogo Falls and Prolonged Drift in Kenya (Gifford-Gonzalez and Kimengich 1984; Bower and Chadderdon 1986; Robertshaw 1989, 1990; Marshall 1990; Bower 1991). It may be that the community at Kalangale Hill was simply taking advantage of seasonally available abundances of wild resources to supplement their diet. However, as noted by Robertshaw (1989, 1990), ethnographic data show that among East African pastoralists today hunting is regarded as an activity for "poor" people whose herds have been depleted by drought or disease. Certainly, the rarity of archaeological sites with mixed faunas implies that similar ecological and cultural pressures were also operating on prehistoric pastoralists. The assumption is that Kalangale Hill was occupied by "poor" pastoralists, who were forced to supplement cattle herding by hunting large mammals. The utilization of land snails, a food source otherwise exploited only by hunter-gatherers, emphasizes the severity of the circumstances of the early pastoralists at Kalangale Hill.

The uniqueness of Kalangale Hill as a Pastoral Neolithic site with evidence of exploitation of wild mammals and land snails might be explained by its geographical location. It has been suggested that early pastoralists were unable to penetrate southwards beyond the Serengeti Plains because they were constrained by the extensive tracts of miombo woodlands that are infested with tsetse flies (*Glossina* spp.) (Bower 1991; Phillipson 1993). Kalangale Hill represents the southernmost Pastoral Neolithic site known in eastern Africa, and it is presently located at the margin of the miombo woodlands, close to the current distributional limits of *Glossina morsitans*, an important vector of bovine trypanosomiasis or *nagana* (Moore 1972; Rodgers 1996). Today, the area around Kalangale Hill consists of open grassland, with only a sparse coverage of dwarf acacia, but it is known that the Manonga Valley was

more densely vegetated in the recent past (Harrison and Mbago 1997). The thickets and woodlands have been cleared by the local Sukuma farmers to provide suitable grazing land for their cattle and to eradicate tsetse flies. In addition, the severe shortage of water in the Manonga Valley during the dry season would have been a serious concern for early pastoralists, because there are no naturally occurring permanent water sources. The large herds of cattle maintained by the Sukuma today are sustained because of the year-round availability of water from reservoirs and boreholes.

It is reasonable to assume, therefore, that the prehistoric community at Kalangale Hill occupied an area that was marginal for viable pastoralism. The combined effects of *nagana* and of water shortages during the dry season would have depleted the cattle herds, with especially dire consequences, perhaps, for pioneer populations who may have arrived with relatively small herds. The high natural attrition of cattle under these circumstances would have required early pastoralists in the Manonga Valley to maintain herd size and composition by supplementing their diet with meat from wild game animals. Since the end of the dry season would have been the period of greatest stress, this might explain the seasonal exploitation of land snails at the beginning of the rainy season. Land snails are an unusual food item, rarely eaten by peoples in East Africa today, so one might be tempted to speculate that the pastoralist community acquired this habit from neighboring hunter-gatherer communities who are known to have had a long-term tradition of land snail exploitation in the area.

### Inolelo 3

A similar archaeological occurrence to that at Kalangale Hill was discovered while prospecting at the paleontological locality of Inolelo 3 (Hh1w-10; 3°54'S 33°44'E). The locality is situated on the floor of the Manonga Valley, about 400 m west of the village of Kalitu (Figure 1). The archaeological site consists of a midden, comprising a dense accumulation of the shells of *Achatina*, *Limicolaria*, and freshwater bivalves. The layer of shells is approximately 50 cm thick, capped by a thin layer of red alluvium. The shells presently cover an area of approximately 100 m<sup>2</sup>. Other faunal remains include those of cows, caprines, and zebras.

A spine of a clariid catfish was also recovered. Since bivalve mollusks occur more frequently at Inolelo 3 than they do at Kalangale Hill, it is likely that the former community was exploiting freshwater resources more extensively. This may be due to the closer proximity of Inolelo 3 to the Manonga River. Just as at Kalangale Hill, the fauna is associated with undecorated pottery and quartz artifacts. By itself, the site at Inolelo 3 does not represent an important archaeological occurrence, but it does help to demonstrate that the unusual faunal association at Kalangale Hill is not a unique occurrence. It provides evidence that early pastoralists in the region had a different economic base from those in the rift valley of Kenya, probably because local ecological conditions were suboptimal for pastoralism, and this necessitated exploitation of a wider faunal diversity.

### Conclusions

The site of Kalangale Hill is the first significant archaeological site to be recorded in the Manonga Valley, Tanzania. It represents a Pastoral Neolithic site with a unique faunal assemblage including domestic livestock, wild ungulates, and land snails. This unusual association might be explained by the fact that Kalangale Hill is located on the fringes of the extensive tract of miombo woodland that covers much of western and central Tanzania today. With its high incidence of tsetse-borne trypanosomiasis and seasonal shortages of water, the Manonga Valley would have provided suboptimal conditions for pastoralism. The high attrition of cattle under these circumstances may have required early pastoralists in the region to supplement their diet by hunting and foraging. These preliminary results indicate that further archaeological work at Kalangale Hill might reveal important clues to understanding the ecology and adaptive diversity of early pastoralists in eastern Africa.

### Acknowledgements

We thank the following individuals who participated in the 1996 field season in the Manonga Valley: Becky Dudzik, Christine Kiyembe, Terri Harrison, Avelin Malyango, Alison Murray, Chris Robinson, and Leahanne Sarlo. In addition, we are grateful to Stanley Ambrose, Eric Baker, Rob Blumenschine, Sally Casey, Peter Robertshaw,

Jacques Verniers, and Simon Waane for their help and advice. Permission to conduct research in Tanzania was granted by the Tanzania Commission for Science and Technology, the Unit of Antiquities, and the District and Regional Administrative Offices in Shinyanga. This research was supported by grants from the National Geographic Society, the Boise Fund of Oxford University, and the New York University Research Challenge Fund.

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