Modern Human Behavior in the East African MSA: A Preliminary Evaluation of Lithic Artefacts from Magubike Rockshelter, Tanzania

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Introduction

This poster is a presentation of initial findings from an analysis of lithic artefacts from Magubike, southern Tanzania, a Middle Stone Age (MSA) rockshelter site. Because of the relative scarcity of MSA sites in this region, Magubike represents a unique case to test current assumptions concerning the behavioral evolution of modern *Homo sapiens* (Willoughby 2012). The following research is an attempt to detect and account for changes in lithic resource-use intensity which may be related to past social and environmental trends. These results are part of a larger analysis that is still in progress.

Overview

Many authors argue that the appearance of modern human behavior was stimulated by environmental and socio-demographic pressure on African hominins during the Late Pleistocene (McBrearty and Brooks 2000). As populations expanded and/or were condensed into narrower habitable zones, new adaptive and social strategies were required in order to cope with changing patterns of resource availability, and greater exposure to other human groups. A likely result of this contact was an increase in competition for resources such as lithic raw materials, causing a shift in preference for technologies that made more efficient use of cores and blanks. It is hypothesized here that periods of limited resource availability, such as those that typified the Late Pleistocene, ought to be characterized by an increase in technologies intended to maximize lithic materials. If this is true, an increase in lithic resource-use intensity from the oldest deposits at Magubike to the most recent ones is expected.

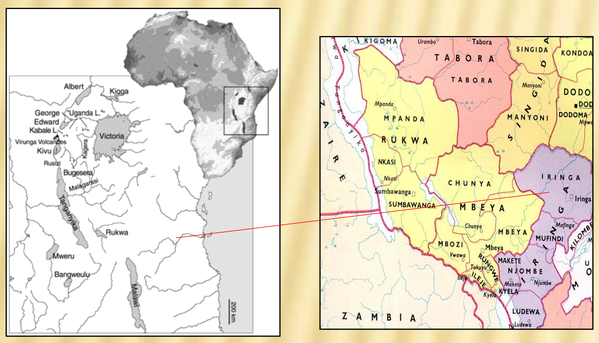


Figure 1: (Left) East Africa and (Right) Iringa, Tanzania.

Magubike – Test Pit 12

Magubike is a rockshelter complex that was excavated by the Iringa Region Archaeological Project (IRAP) in 2006, 2008, and 2012. Lithic artefacts were found on the surface, within the rockshelter, and dispersed among the surrounding fields. The 14,532 artefacts analyzed for this study derive from a single 1 by 1.35 m unit (Test Pit 12), that was excavated during the 2012 field season. Mammal teeth and land snail shells were found throughout Test Pit 12 and attempts to date them using electron spin resonance (ESR) by Anne Skinner are underway. Dating of the sediments using optically stimulated luminescence (OSL) is being attempted by James Feathers.

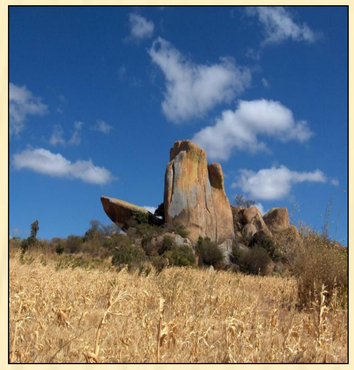
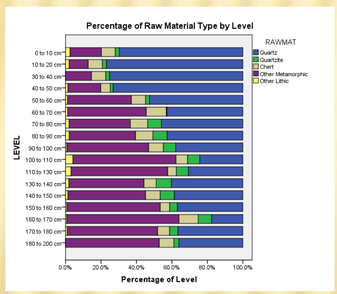


Figure 2: (Left) - Magubike rockshelter; (Right) - Typical MSA artifacts from Test Pit 12 (80-90 cm).

Test Pit 12 was excavated to a depth of 200 cm, extending from the modern ground surface to the bedrock, and consisted of 40-50 cm of Iron Age (IA) and historical deposits stratified above MSA materials. Later Stone Age (LSA) levels have also been documented at two other adjacent areas of the site and radiocarbon dates from two ostrich eggshell beads from the IA levels indicate a likely LSA presence in Test Pit 12 as well.

Most tool categories were present in every level of Test Pit 12; although a number of different tool types were associated in greater numbers with certain levels. Backed tools were most common in the IA/LSA while points and scrapers formed the bulk of the materials in the MSA levels. The lithic raw materials that people employed to create tools also changed between the IA/LSA and MSA. Although quartz was ubiquitous in all levels of Test Pit 12, it was more extensively exploited during the IA/LSA, while metamorphic stones seem to have been favoured during the MSA. Small amounts of chert were also used during both the MSA and IA/LSA.



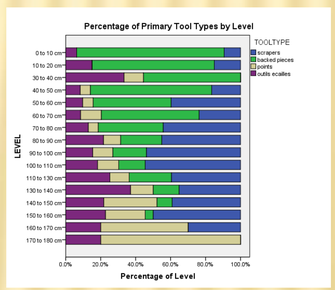


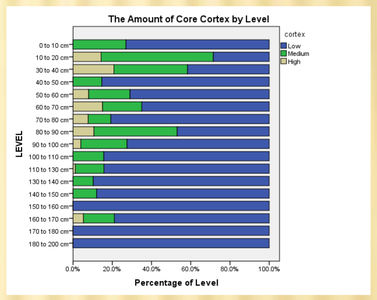
Figure 3: (Left) n=14,532; (Right) n=743.

Methods

In order to test the hypothesis, several measures of resource-use intensity were explored. Bipolar flaking is thought to allow for the exploitation of otherwise irreducible cobbles or nearly exhausted cores (Goodyear 1993). Evidence of this technique, which included bipolar cores and core fragments as well as scalar pieces, was plotted by level in order to reveal a relationship between bipolar flaking and depth. The remaining cortex on discarded cores and flakes was also plotted according to level as cortical coverage has been shown to decrease as reduction intensity increases (Marwick 2008). Lastly the mass of cores at the time of discard was investigated for change over time, as more thoroughly reduced cores were hypothesised to be smaller. Statistical tests include chi-square, Cramer's V, Pearson's correlation, and Spearman's rank-order correlation.

Results

- Bipolar cores easily outnumbered other core types in Test Pit 12 (84.8% of the cores are bipolar) and evidence of bipolar flaking was evenly distributed throughout the archaeological sequence.
- Cores retained more cortical surface in the upper levels of Test Pit 12, having apparently been worked less extensively. The amount of remaining flake cortex was also demonstrated to be weakly, but significantly related to level, supporting the idea that cores were less thoroughly reduced in the more recent levels of the sequence.
- While quartz cores showed no significant variation in size over time, metamorphic cores declined in size with depth. This might also indicate that reduction intensity diminished in more recent levels.



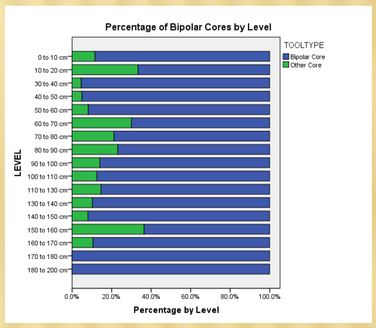


Figure 4: The n of both graphs was 561.

Conclusions

Based on these results, it is suggested that the high prevalence of bipolar flaking at Magubike was most likely a response to lithic raw material constraints that existed throughout the site's history. Lithic sources have yet to be securely identified, but survey has indicated that the bipolar technique may have been adopted as a means of working small, rounded cobbles recovered from nearby streams. Additionally, the amount of remaining cortex and the size of the cores at Magubike show that resource-use intensity may have declined rather than increased as expected. Nevertheless, a shift in raw material preference to local, low-quality quartz, detected around 40-50 cm, may have been implemented to ameliorate competition for lithic resources caused by population pressure or changing land-use habits. Further work analysing the remaining lithic materials from the site is required to bolster these findings. Locating lithic material sources is also vital to understanding changes in stone acquisition practices.

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