

## INTRODUCTION

- Archaeologists and human palaeontologists generally agree that our own species, *Homo sapiens*, evolved in Africa by the beginnings of the Middle Stone Age (MSA) around 200,000 years ago (Stringer 2016).
- Descendants of MSA Africans left the continent around 50,000 years ago and colonized the globe.
- This was unexpected because stone tools similar to MSA ones are associated with another kind of human, the Neandertals in Eurasia.
- Modern humans only appear in Eurasia between 50,000 and 40,000 years ago: they are associated with a distinctive stone tool industry (the Upper Palaeolithic or UP).
- There are also remarkable technological innovations in the UP including bone tools, art, and jewelry.
- Africanist archaeologists have been looking for signs of these innovations in the MSA; some are present but generally late.
- Do African MSA people have to have an UP way of life to be truly modern? Did this occur prior to the spread of people out of Africa into Eurasia.

## OBJECTIVES

- Understanding the role of Southern Tanzania in the evolution of modern humans in light of ideas mentioned above.
- In Tanzania, we make use of Mehlman's (1989) classification of stone artifacts, which is based on his research in Mumba in northern Tanzania.
- Categories: tool, core, debitage, and ground stone.
- A tool is a piece of flaked stone which has been shaped further after removal from a core (retouched).
- Tools: scrapers, backed pieces, points, burins, bifacially modified pieces, becs, composite tools, outils écaillés, and heavy duty tools.
- A core is a piece of rock from which flakes have been removed.
- Debitage are all pieces removed from a core which are not retouched; includes whole flakes and blades (a detached piece which is twice as long as it is wide).
- A ground stone is any rock or piece of stone with evidence of grinding or pecking; also includes hammerstones.
- The kinds of tools and cores tell one what culture period is being dealt with.
- Iringa is a region in the Southern Highlands in Tanzania.
- It is known for its ancient rock outcrops, which have eroded out into caves and rock shelters.
- Starting around 200,000 years ago, people have used these places as their home and a place to carry out daily activities.
- The Iringa Region Archaeological Project (IRAP) was formed in 2006 to investigate the complete range of human history in this area (Willoughby 2012).
- In gullies which expose an ancient land surface, artifacts characteristic of the Acheulean (handaxes, cleavers, picks) are found.
- At a rock shelter like Magubike, the entire post-Acheulean archaeological sequence is present: Middle Stone Age (MSA), Later Stone Age (LSA), Iron Age, Historic, and Modern.

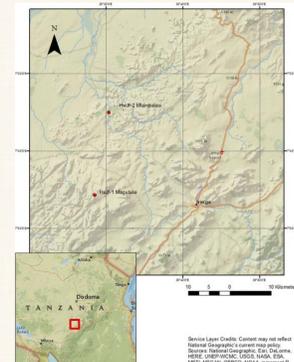


Fig. 1. Map of Tanzania, with location of Iringa and Magubike (Werner and Willoughby 2017)

- Excavations at Magubike have taken place in 2006, 2008, 2012, and 2016.
- The focus has been on the MSA occupation.
- How old is the MSA here? Most dating methods (Radiocarbon, OSL, ESR) state that the MSA in the main part of the site is at least 50,000 years old and possibly up to 100,000 years old.



Fig. 2. Magubike Rock Shelter. Photo: P. Willoughby.

## MATERIALS & METHODS

- The materials studied here come from the 2012 field season.
- Test Pit 9 (TP9) is in the main part of the site under the modern roof.



Fig. 3. Left: 2012 excavations at Magubike with University of Dar es Salaam archaeology students. Photo: P. Willoughby. Right: Map of Magubike excavations. Created by J. Miller.

- The cultural sequence here is composed of Historic/Modern, Iron Age, and MSA.
- Historic/Modern = modern tools, metal fragments, objects with dates of manufacture on them, eg. a coin.
- Iron Age = first farmers, members of the Bantu language family; artifacts include iron and slag, remnants of iron furnaces, the first pottery, and domesticated plants and animals.
- MSA = stone tools include: scrapers, points, outils écaillés, bipolar, and circular cores; bones of wild animals, some of which are fossilized, snail shells, ostrich eggshell (OES) beads.
- Is there an LSA in this part of the site? Two radiocarbon dates on OES beads say yes, but the artifacts do not agree.
- TP9 measures 1 m by 1 m and was excavated in artificial 10 cm levels to the bedrock layer at 180 cm below the surface.
- Along with the 13,843 stone artifacts, IRAP members recovered fossilized animal bones, large *Achatina* snail shells, OES beads, and in the Iron Age levels, pottery, iron, slag, and domesticated animal bones.
- Mehlman's categories describe the kinds of stone artifacts.
- More recently, archaeologists have tried to trace the life history of stone artifacts from the acquisition of raw materials, production of tools, use, and ultimate discard into what we call archaeological sites.
- One way to do this is by recording stages of production for flakes.
- This was first done by archaeologist Nicholas Toth (1982) who examined stone artifacts from Oldowan sites east of Lake Turkana in northern Kenya.
- Both numbers range from I (the first flake removed from a core) to VII (flakes from the inside of a core). This is calculated by the presence of cortex (the original rough outer surface of a rock) on the striking platform and the dorsal (outside) surface of flakes.
- We have added a category VII for tools which lack a platform so therefore cannot be measured.
- Parallel sided flakes are called blades. They are supposed to be more common in the LSA, but here are also found in the MSA.

## RESULTS

- TP9 contains 554 retouched tools (4.0% of total), 653 cores (4.7%), 12,634 pieces of debitage (91.3%), and 2 ground stone pieces (0%).

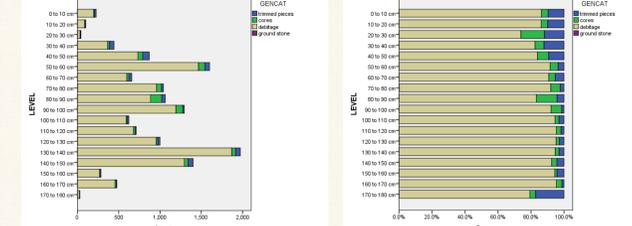


Fig. 4. Left: Number of stone artifacts by depth in TP9. Right: Percentages of stone artifacts by depth in TP9.

- Of the 554 tools in TP9, 145 are scrapers (26.2% of total), 191 are backed pieces (34.5%), 23 are points (4.2%), 9 are burins (1.6%), 11 are bifacially modified pieces (2.0%), 1 is a bec (0.2%), 1 is a composite tool (0.2%), 172 are outils écaillés (31.0%), and 1 is another kind of tool (0.2%).

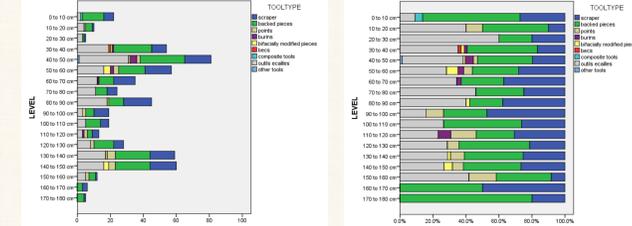


Fig. 5. Left: Kinds of stone tools by depth in TP9. Right: Percentages of stone tools by depth in TP9.

- Of the 653 cores in TP9, 25 are peripheral cores (3.8% of total), 42 are patterned platform cores (6.4%), 3 are intermediate cores (0.5%), 577 are bipolar cores (88.2%), and 7 are amorphous cores (1.1%).

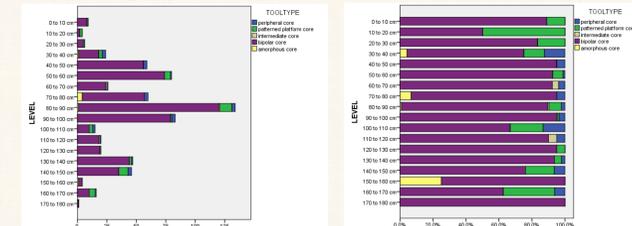


Fig. 6. Left: Kinds of cores by depth in TP9. Right: Percentages of cores by depth in TP9.

- Of the 13,843 stone artifacts in TP9, 5421 are quartz (39.3% of total), 128 are rock crystal (0.9%), 582 are quartzite (4.2%), 1111 are chert (8.1%), 6,557 are other metamorphic (47.5%).

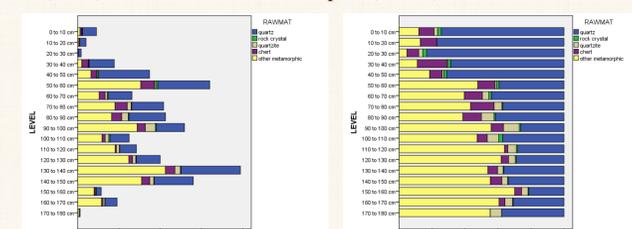


Fig. 7. Left: Raw materials by depth in TP9. Right: Percentages of raw materials by depth in TP9.

- Of the 1,291 whole flakes in TP9, 177 are quartz (13.7% of total), 13 are rock crystal (1.0%), 100 are quartzite (7.7%), 171 are chert (13.2%), and 830 are other metamorphic (64.3%).

- For whole flakes, Toth numbers are mainly V and VI, meaning they were struck off from a core with little or no cortex remaining.

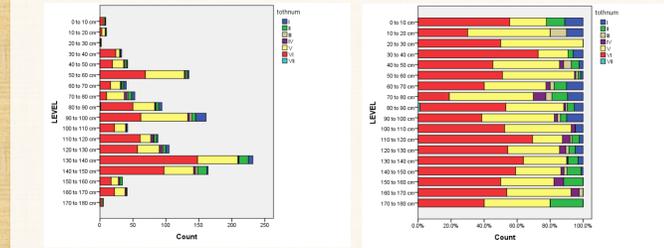


Fig. 8. Left: Toth numbers by depth in TP9. Right: Percentages of Toth numbers by depth in TP9.

- In TP9, there are 100 whole blades, 130 bottom thirds of blades, and 184 middle or upper thirds of blades. Blade production occurred during the MSA but there are fewer blades than flakes. True blade cores are extremely rare.

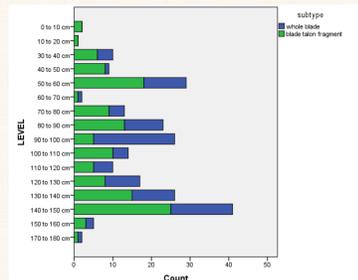


Fig. 9. Numbers of blades and bottom thirds of blades by depth in TP9.

## CONCLUSIONS

Clearly people are manufacturing stone artifacts at TP9 in both the MSA and Iron Age. All stages of production are present. There are surprisingly few retouched tools; only 4% of the total. It is entirely possible that finished tools were taken somewhere else for use.

There is a clear change in raw material preference between the Iron Age and the MSA; in the Iron Age, quartz and chert were preferred, while in the MSA other metamorphic rock is the most abundant. The variety of raw materials is much wider in the MSA than in the Iron Age.

Cores are predominantly bipolar, where pebbles or cobbles of raw material were placed on a stone anvil and then struck with a hammerstone to remove flakes. On account of this, few of the diagnostic core types are present.

Southern Tanzania is only now being investigated for Stone Age archaeological sites. TP9 at Magubike contains a MSA where stone artifacts are associated with fossilized animal bones, large mollusk shells, and OES beads. Examining this material helps us understand the choices in behavior of early modern humans in this part of Africa.

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