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# ***EARLY MODERN HUMAN BEHAVIOURAL RESPONSES TO MARGINAL LANDSCAPES: MIDDLE STONE AGE GEOARCHAEOLOGY IN HIGHLAND LESOTHO***

## **Background and Rationale**

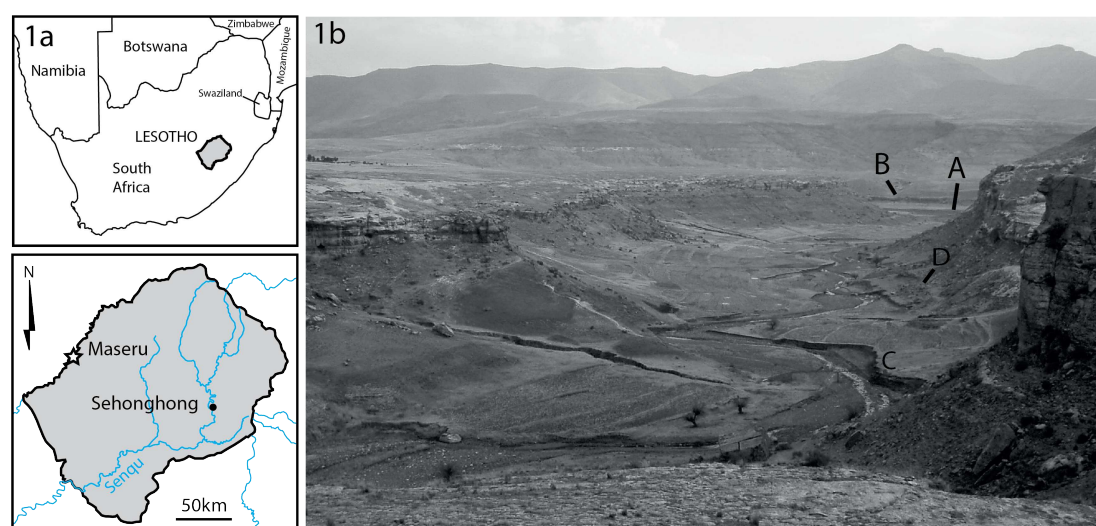
The African Middle Stone Age (MSA) contains some of the earliest occurrences of symbolic and technological behaviours which herald fully modern human cognition (e.g. engraved ochre, shell beads) as early as ~70,000BP in Southern Africa (Jacobs *et al.* 2008). Such behaviours may have accompanied an increased potential for hominin populations to adapt to a range of habitats, and to ultimately disperse globally (Oppenheimer 2009). The weight of existing evidence for such behaviours, however, lies in the resource-rich, atypical region of the Cape Coastal ecozone. The presence of MSA industries in the Lesotho Highlands (Carter *et al.* 1988; Stewart *et al.* 2012) provides an opportunity to develop models of human responses to environments in montane environments. Current understanding of Quaternary palaeoenvironments in highland Lesotho is, however, limited. Renewed archaeological investigations in and around Sehonghong Rockshelter, Western Drakensberg, by the 'Adaptations to Marginal Environments in MSA South Africa (AMEMSA)' project provides the opportunity for a programme of palaeoenvironmental reconstruction to be developed alongside archaeological investigations. This will provide an integrated environmental and cultural history with which to examine human-environment interactions during the MSA, as well as contributing to our understanding of late Pleistocene environments in montane Southern Africa.

A QRA New Researcher's Award contributed to the travel costs of the author to take part in an initial geomorphological survey of the Sehonghong valley in August 2011. Specific aims of this fieldwork were:

- to characterise the landforms present within the valley, and their relationship to archaeological material;
- to locate sections of exposed stratigraphy in river-cut sections and erosion gullies (dongas) to sample for absolute dating and palaeoenvironmental investigations.

## **Results**

Sehonghong Rockshelter is located at 1800m asl in Thaba Tseka district, Eastern Lesotho. The shelter is located at the narrowest part of the Sehonghong valley (c. 50m), where the Sehonghong river meanders sharply, and was formed within the Clarens sandstone. The survey focussed on the area downstream of the rockshelter towards the confluence of the Sehonghong with the Senqu (Figure 1).



**Figure 1.** a) Location of Sehonghong rockshelter and the survey area (maps courtesy of B. Stewart). 1b) View of the Sehonghong valley looking west towards the confluence of the Sehonghong and the Senqu (A) and the location of MS1 sediment sequence (B) on the far bank of the Senqu. Sehonghong rockshelter is located 300m to the east of the photo location, in the valley floor. Also visible is the location of RS2

sediment sequence that exposes the valley bottom sediments (C), as are remnant cobble terraces isolated above the active channel and floodplain (D). Photo R. Inglis.

Downstream of the rockshelter the valley widens to ~300m, with the current river channel bordered by heavily-cultivated alluvial terraces. Downcutting into the former floodplain has exposed terrace sediment profiles up to 4m deep. At profile RS2 (Figure 1b), at the edge of the river channel, ~70cm of well-rounded cobbles are overlain by a ~50cm-thick iron-stained sandy layer, which in turn is overlain by ~3.5m of pale-orange silty sand containing a number of potential palaeosols. The sandy unit was sampled for OSL dating, and the palaeosols for bulk <sup>14</sup>C dating. This alluvial sequence appears to be repeated in other exposures along the valley, and indicates high energy transport (basal, lag gravels) in a potentially braided system, followed by lower-energy deposition in an overbank environment, possibly during the Holocene, although absolute dating is required to constrain these changes in river behaviour. Higher (and therefore potentially older) remnant terraces, containing well-rounded coarse river cobbles and boulders, are isolated on the alluvial plain above the present riverbed (Figure 1b), yet their exact relationship to the lower terraces remains unclear. On the slopes above these terraces, a number of lithic scatters are known from previous archaeological survey work (Carter *et al.* 1988).

Further downstream, an ~7m deep sediment profile (MS1) is exposed in a deeply incised minor tributary valley on the western bank of the Senqu, opposite its confluence with the Sehonghong (Figure 1b). The profile, set back from the current main channel, contains silty sand beds, interstratified with darker organic-rich horizons, was interpreted as active colluvial sedimentation (originating from the hillslopes bounding the valley) separated by periods of stability and soil formation. This sequence is truncated at one end by alluvial channel sediments, which appear to document an earlier phase of deposition of the current tributary. These sediments are interdigitated with the main colluvial/palaeosol sequence, indicating a potentially contemporaneous deposition of colluvial/palaeosol and channel sediments, rather than later fluvial incision. The colluvial and palaeosol sediments were sampled for OSL and bulk <sup>14</sup>C dating respectively. On the opposite side of the current tributary cut, a ~9m exposure of silty sand sediments, interspersed with palaeosols and thin rounded pebble layers, appears to show floodplain deposition, presumably of the Senqu itself. It is unclear, however, how these two sections relate to each other and both require further investigation and absolute dating.

### **Significance and Future Research**

The survey has allowed the assessment of the landscape immediately surrounding Sehonghong Rockshelter, providing a working, albeit presently undated, geomorphological framework for the valley that will, in future, be linked to archaeological survey and excavation in the valley and rockshelter itself. Whilst the majority of the valley sediments may be relatively recent, some of the deeper sections observed may extend into the Pleistocene. Such deep profiles hold significant potential for the generation of well-dated palaeoenvironmental records through techniques such as stable isotope and phytolith analyses (e.g. Parker *et al.* 2009; Wintle *et al.* 1995). As yet, no records of Pleistocene environmental change exist from Lesotho, and such records are desperately needed to place the important cultural records from Sehonghong and other rockshelters in the region within their environmental context. The confirmation of a Pleistocene age for the deposits identified by this survey would therefore provide a major step towards characterising MSA human-environment interactions in Lesotho and the assessment of the role of 'modern' behaviours in the ability of human populations to adapt to a range of environments and expand globally.

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