Late Pleistocene and Holocene Environments in the Lesotho Highlands

Key References

- Smith et al. 2002. Stable C and O isotopic evidence for late Pleistocene to middle Holocene climatic fluctuations in the interior of southern Africa. JQS.

Acknowledgements

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Materials and Methods

- δ¹³C of soil organic matter in the site (c. 7 kBP to 35 kBP) => plants growing around the cave (human fuel, food and, especially, bedding).
- The strong anthropogenic bias limits interpretation to trends in the sequence (i.e. changing temperatures).
- δ¹³C of grazier enamel => relative proportions of C3 and C4 grasses in the animal’s diet, although animals move seasonally between upland and lowland grazing lands.
- 25 teeth (zebra, eland and hartebeest) from a 2 ka span in MIS 3.
- Charcoal radiocarbon dates => ABOx method is most efficient at removing contaminating carbon. Prepared in the RLAHA Radiocarbon Unit and analysed on Oxford Radiocarbon Accelerator Unit’s HVEE AMS system.

Results and Discussion

- Dates => Due to removal of trace amounts of young carbon contaminants, the ABOx method generally produces older dates, compared to other, less rigorous, radiocarbon pretreatment methods (Bird et al., 1999; Wood et al., 2012). Thus, this method produces dates which are the maximum ages obtainable using radiocarbon techniques, and cannot be considered “too young.” The new dates from Sehonghong range from 25330 ± 130 to 31030 ± 250 uncalibrated years BP. They accord well with the existing radiocarbon chronology of the overlying deposits.

- Soil organic matter => The δ¹³C values of soil organic matter (SOM; see figure below left) reflect a vegetation community dominated by C3 plants until the end of the Pleistocene. This indicates lowered vegetation belts at least to the altitude of the cave, indicative of cooler temperatures by at least 5°C.

Summary

- The soil organic matter stable isotope results confirm a depression of vegetation belts in the region during the last glacial period and suggest a temperature difference from today of at least -5°C, before the warming at the end of the Pleistocene. The data also support previous reconstructions which indicate that the transition from the Pleistocene to the Holocene was a time of marked climate variabili-

- The results will be complemented by ongoing faunal, sedimentological and phytolith analyses. The secure chronology of the site, now extending back to c. 36 kcal BP and the extraordinary preservation of organic material holds great promise for exploring the lifeways of hunter-gatherers in this harsh environment during the Middle Stone Age.