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Mary Leslie
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**PROGRESS REPORT**
**PERMIT No. 80/05/05/017/51**
Issued 13th July 2005
To Lucinda Backwell

In association with Lyn Wadley, Louis Scott, Zoë Henderson,
Marion Bamford, Marlize Lombard, Lloyd Rossouw and Terence McCarthy.
For undertaking limited exploratory excavations at Wonderkrater peat mound.

Dear Mary

Following the conditions stipulated in the permit, I report here on my research activities at Wonderkrater in 2005.

We started with a comprehensive surface survey, collecting and plotting surface finds in a 20m radius of the site. We then proceeded to open four pits at different distances from the spring eye, to sample the different soil types (wet peat, dry peat, grey dust, course sand) and preservation conditions. We took peat samples at 5cm depth intervals for radiocarbon dating, pollen and isotope analysis. We recorded by means of a total station theodolite, digital camera and line drawings, sections of walls and the position of features and artefacts at the site. All activities were recorded in a central measurement book, and the information duplicated in notebooks kept by all team members. Zoë Henderson and I were on site with the excavation team at all times.

I am happy to report on successfully achieving all of my short-term goals.

Goal 1. In accordance with our short term research aims, we discovered numerous Middle Stone Age lithics in a fresh state of preservation in three of the four pits excavated. This indicates that the site is extremely rich when one considers that only a few square metres were excavated in an area the size of a cricket field. Our excavation results are as follows: In Pit

A we discovered what appears to be a Middle Stone Age (MSA) core 37cm below surface, which according to McCarthy corresponds to a depth of 3 000 years ago. Even if the core is Later Stone Age (LSA) Oakhurst (non-microlithic industry 8 000-12 000 years ago), it still does not correspond to the proposed age-depth. In Pit C we found MSA tools (with characteristic facetted platforms) half a metre lower than predicted from auger-drilled cores. Lithics have been preliminarily sorted. We did not find any bone tools, but this is not surprising as they rarely survive in the archaeological record.

Goal 2. In our hope to establish a faunal list for the site, we were happy to retrieve two extremely large mammal foot bones on the last day of excavations as we entered the water table. These are preliminarily identified as rhino carpal bones. This is very promising for future excavations as we understand better now how preservation works at the site, and will excavate more rapidly until we reach the water table.

Goal 3. A short term aim was to understand the site formation processes and taphonomy of the site. Quartz crystals found in the moist peat deposits tell a story of site formation that is linked to climate. Fine wind-borne sediments are found dispersed throughout the deposits, but a dense layer of course grains in one pit signals a time of deflation and flooding of the area. The surfaces of the bones found so far do not bear traces of modification by humans or other animals, but taphonomic studies have shown that compact irregular bones seldom record evidence of damage caused by predators. Further excavations hold promise of shedding more light on the site formation process, which in reality is complex and better characterised as a long term goal.

Goal 4. We initially wished to test whether depressions and gullies concentrate remains. This was an ambitious long term goal that is in practice quite destructive. We do not wish to disturb the water table and peat mound system so probably will not pursue this question, though we will note the depths of finds in the controlled pits we excavate and piece together our finds at the end.

Goal 5. A short term goal was to analyse, describe and compare finds with remains from contemporaneous South African and European sites. Lithic remains found in the first field season have been identified and sorted into Later and Middle Stone Age. Comparison with other sites will be conducted once the finds from all three field seasons are known.

Goal 6. A major goal was to use artefacts and bones to calibrate the pollen sequence of climate change at the site. This is currently under analysis, with a 5cm interval peat sequence submitted to collaborators Dr. Stephan Woodborne of the CSIR in Pretoria for dating, Professor R. Sukumar of the Centre for Ecological Sciences in India for isotope analysis,

Professor Louis Scott (University of the Free State) for pollen analysis and Mr. Lloyd Rossouw (National Museum) for phytolith analysis. The bones and stones are currently being studied by Dr Zoë Henderson and me.

Goal 7. Another major goal was to develop new ways of dating and studying the mound. While radiocarbon methods are currently being applied, OSL dating was found not to be viable because the method depends upon a certain amount of quartz in the deposit, and Dr. Zenobia Jacobs at the CSIR discovered that the amount in the peat was not sufficient for dating purposes. Professor R. Sukumar at the Centre for Ecological Sciences in India is studying oxygen isotopes in the peat sequence to gauge fluctuations in temperature and humidity, and stable carbon isotope ratios to know the proportion of C3 to C4 plants through time. Isotopic studies thus provide new and independent climate data for calibration. A number of seeds and pieces of wood were retrieved and will be studied by Dr. Marion Bamford and myself.

In accordance with our long term research aims:

Goal 8. We aim to correlate archaeological and pollen sequences to an 8m depth. In our first field season we reached 2.5m on the last day of excavations. This was following two weeks of methodical excavation and close inspection of every inch of peat removed. The process was relatively slow, but we needed to be comprehensive and systematic in order to understand the nature of the deposit in relation to the water table. In our next field season we will dig more quickly until we reach the water table. This will enable us to reach a 6m depth, but this will require opening a longer trench to step the excavation.

Goal 9. We hope to identify pre-20 000 BP vegetation types. This can only be known at the conclusion of the project, once we have reached 8m, and the pollen sequences are calibrated.

Goals 10-14. Will only be known at the conclusion of the project.

Goal 15. Test whether the mound grows 1m every 4 000 years as hypothesised by Wits University geologist, Terence McCarthy. Ongoing, and currently under analysis.

Results will be published in 2007 and copies lodged with SAHRA.

With kind regards.

Lucinda Backwell