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In the mix: Replication studies to test the effectiveness of ochre in adhesives for tool hafting

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A dissertation submitted to the Faculty of Science, University of the Witwatersrand, Johannesburg, in fulfillment of the requirements for the degree of Master of Science.

Johannesburg, 2005

DECLARATION

I declare that this dissertation is my own unaided work unless otherwise acknowledged. It is being submitted for the degree of Master of Science in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any other degree or examination in any other university.

_____

T.P. Hodgskiss

_____ day of _____, 20___

ABSTRACT

This study was stimulated by questions that arose on the Middle Stone Age (MSA) tools from Sibudu cave, KwaZulu-Natal, South Africa. Many stone tools were found to have ochre traces or ochre plant resin traces on their proximal ends, as well as bending fractures on their laterals caused by hafting. This placement of ochre is unusual because it would be expected that ochre would be found on the working edges of the tools if they had been used to prepare ochre. A possible explanation is that the ochre is part of the hafting process and that ochre was used as an aggregate in the adhesive that held the stone tool to the haft.

The question this research aims to answer is why ochre was used as an aggregate in plant resin instead of other easily acquirable substances, such as sand or ash. I have experimented with a variety of aggregates and then performed various activities with the hafted tools to test the strength and effectiveness of the different adhesive recipes. The chemical and physical properties of the ingredients used in the adhesives are also explored, together with principles of geological cementation and the methods involved in the creation of industrial concrete.

Results of my replications are varied and they show that uncontrollable variables influence the resultant adhesive quality. Results contribute to understanding the uses and implications of the ochre on the MSA sites, and illuminate that people living in the MSA had an understanding of the best physical and chemical properties needed in adhesives, even though they could not have had an understanding of attributes like mineralogy and pH.

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