BLACK BONES: DISTINGUISHING BURNED FROM STAINED

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Abstract

Identification of black bone as burned is central to understanding when and where fire was first used as a tool and distinguishing between materials deposited by humans and other agents. Staining by chemicals in the soil can also blacken bone. X-ray crystallography, Fourier transform infra-red spectography (FTIR), and scanning electron microscopes (SEM) can determine whether a blackened bone has been burned. However, not all archaeologists have access to this high tech equipment. Even when the technology is available, in many instances using them is impractical. They cannot be used in the field and testing thousands of small bones may be cost prohibitive. Clearly defined and accurate macroscopic features that suggest an initial estimation of burning would be useful. For this project a sample of burned bones and one of stained bones was created and examined macroscopically. Burned bones exhibit higher frequencies of grainy texture, worn appearance, and light reflection. Stained bones exhibit higher frequencies of mottled and banded color distribution as well as blurred color margins. A logistical regression model for binary data yields the probability that a bone is burned or stained. To test the accuracy and reliability of this method, blackened bones in the *Abrigos de los Escorpiones* archaeological assemblage will be analyzed for likelihood of burning. The bones will then be subjected to scanning with X-Ray Fluorescence (XRF) or SEM to identify which how accurate the macroscopic features criteria is in predicting modification type.