The Anthropology Department
Brown Bag Series

Presents

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Friday, February 17 @ noon
McDonel Hall, Room 106-C

The Utility of Scanning Electron Microscopy in the Evaluation of Archaeological Samples:
A Report of a Pilot Project Using Ancient Maya Dental Remains

Archaeological work in Belize has been undertaken since the mid-20th century on a large scale, with much of the research focused on the interpretation of skeletal remains to answer broader questions about pre-Hispanic culture. Based upon the grave goods found associated with individuals buried in caves and rockshelters, it has long been hypothesized that those interred in caves were high status individuals and their deposition fulfills some ritual purpose such as ancestor worship or appeasement of the underworld spirits that, as outlined in Maya belief systems, controlled the critical resources of the earth. Alternative to this karstic ideational mortuary space, rockshelters are thought to contain the remains of commoners, or those individuals who worked for the dynastic elite. Rockshelters have been considered to be burial repositories akin to a rural cemetery containing lower status individuals. This binary hypothesis (caves are for elites, rockshelters are for commoners) is rooted in previous archaeological excavations and has not been rigorously tested biologically.

I will test this hypothesis using biological samples, namely dental enamel, in my dissertation. This project will examine health status of individuals in different burial locales in order to make inferences about social status; the overarching hypothesis is that there will be a predictable, quantifiable health disparity between individuals in these disparate interments. This biological data will then be used to address cultural questions of commoner identity and mortuary ritual. Previously, bioarchaeologists have focused their efforts on examining the remains of elites in tomb burials. However, this restricted sample yields information only the estimated 10% of the population that was considered high status. The combined biocultural approach proposed in my dissertation can identify patterns of health and status, thus providing a more dynamic picture of the past by incorporating the experiences of the other 90% of the Maya world.

In this presentation, I outline the basics of my dissertation project as discussed above, however the focus is on methodology. I aim to present the results of my pilot data, as well as discuss possible future directions in research using this microscopy technology. Working in conjunction with the Center for Advanced Microscopy (CAM) on MSU’s campus, I have analyzed biological samples using scanning electron microscopy (SEM). The import of this technology for anthropology students is two-fold: 1) through CAM, students have access to SEM and confocal light microscopy, both of which are useful for non-destructive evaluation of archaeological materials; and 2) through SEM analysis, the atomic weights of elements may be read and mapped in biological materials.