

ABSTRACT

A GIS Image Analysis Approach to Documenting Oldowan Hominin Carcass Acquisition:
Evidence from Kanjera South, FLK Zinj,
and Neotaphonomic Models of Carnivore Bone Destruction

by

Jennifer Ann Parkinson

Adviser: Thomas Plummer

This dissertation presents taphonomic analyses of human- and carnivore-modified bone assemblages in order to elucidate the timing of hominin access to carcass resources in the African Early Pleistocene. One of the defining adaptations of the genus *Homo* is the routine incorporation of animal tissue into the diet with the aid of tools. As a nutritionally dense food source, the addition of meat to the diet is often associated with important changes in the morphology and behavior of early hominins. Yet the ecological and behavioral implications of meat consumption for hominins are not well understood. This study tests competing hypotheses of hominin carcass acquisition and hominin-carnivore competition through a comparative study of carnivore- and hominin-induced modifications in the zooarchaeological assemblages from Kanjera South, Kenya (ca. 2 Ma) and FLK I Level 22 (FLK Zinj), Olduvai Gorge, Tanzania (ca. 1.84 Ma). Patterns of bone preservation and the distribution of bone surface modifications from these two sites are analyzed within a comparative framework of new and existing taphonomic models. The new taphonomic models presented here include the largest modern bone assemblages documenting large felid and canid bone damage to date. A GIS image analysis method is used to analyze patterns of bone damage in experimental and archaeological assemblages. The GIS method originally described by Marean et al. (2001) is expanded here to

incorporate ArcGIS Spatial Analyst tools, and this method is applied for the first time to analyze patterns of hominin and carnivore damage. Results of these analyses suggest hominins at both Kanjera South and FLK Zinj had early access to carcasses. At both sites, small and medium bovid carcasses may have been obtained through hunting, while remains of larger carcasses may have been obtained through active scavenging. Despite the evidence for early carcass access at both sites, overall frequencies of both hominin and carnivore modifications are lower at Kanjera South compared to FLK Zinj, suggesting differing competitive regimes at the two sites and potentially signaling differing behavioral strategies.