Tracing the links between elephants, humans, and land use in East Africa during the 19th century caravan trade: a bioarchaeological study

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Where, when, from what kind of habitats, and at what intensity were elephants exploited during the 19th century East African caravan trade?

Available historical records indicate that ivory was extracted from East Africa on a massive scale during the 19th century, especially from the 1860s. On the basis of these sources it has been hypothesised that elephants were virtually eradicated from some ecosystems, and severely depleted in others. It has also been argued that the removal of elephants on this scale had radical and long-lasting consequences for East African habitats and economies (Håkansson 2004).

In order to improve on scholarly understanding of the distribution of elephant herds in the 19th century in East Africa, and to test the hypotheses outlined above, this study will use two methods (archival research and isotope analysis) to source historic elephant ivory. The more specific aims of the research are to improve the temporal and spatial resolution of information about where elephants existed and how they were impacted during the 19th century caravan trade, particularly from the 1860s onwards.

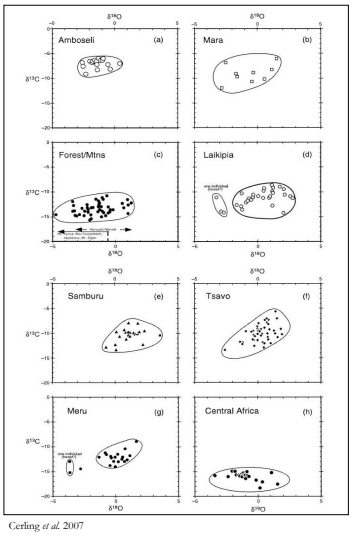
The main analytical methods to be employed will be stable light isotope and radiogenic isotope analyses of ivory of known date in order to identify the geographical source of different pieces of ivory held in collections such as museums and archaeological assemblages from ivory factories in the US, UK, and East Africa, and to recover proxy environmental information about the habitats occupied by the individual elephants that were the source of the ivory.

Historical documents/Archival Research

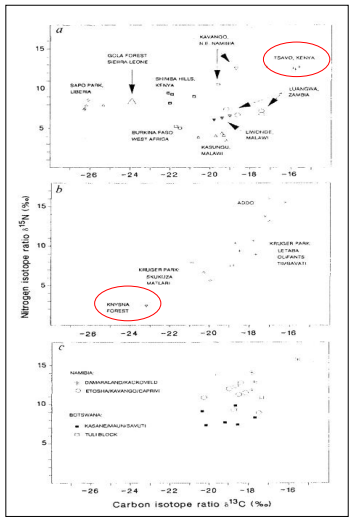
- Colonial explorers' accounts (Last, Burton & Speke)
- East African trade records (Zanzibar)
- Records from ivory manufacturers/excavation:
  - Deep River/ Ivoryton, Connecticut
  - Sheffield, England
  - Erbach/Michelstadt, Germany

'These caravans, if they may be so called, arrive in 20 days at the Masai and Wakuafi countries, remain trading there for three or four months, and return laden with ivory and a few slaves purchased en route.'

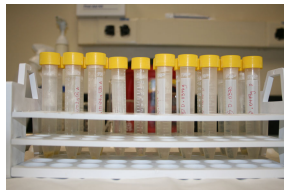
(Burton & Speke 1858)



Cerling *et al.* 2007



van der Merwe *et al.* 1990



Provenance using isotopes: East African elephants

- $^{13}C/^{12}C$ (plant part of diet, habitat-open/closed canopy)
- $^{15}N/^{14}N$ (marine/terrestrial, aridity, obligate drinker)
- $^{18}O/^{16}O$ (meteoric water, distance from sea, altitude, latitude)
- $^{87}Sr/^{86}Sr$ (geologic composition of bedrock-provenance)

Smithsonian Natural History Museum's East African Elephant Collection

- Theodore Roosevelt's 1909 expedition to British East Africa
- Samples of tusk, molars, and bone for isotope analysis from 21 specimens with provenance
- Creates baseline data for future isotope analysis on unprovenanced worked ivory

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