

Insights into site formation at Rose Cottage Cave, South Africa, based on the analysis of sediment peels

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Rose Cottage Cave (RCC), in South Africa, has been a key site for explaining the origins of modern human behaviour and movement of early modern humans out of Africa. Nine sediment peels were made previously from the profile sections, preserving original materials that provide a record of cultural and environmental change during the late Pleistocene and Holocene. Here, we present the preliminary results of the study of the RCC sediment peels which aims to investigate site formation processes and the implications for site interpretation. Methods used include micromorphology and Fourier Transform Infrared spectroscopy coupled with detailed observations of the peels. The predominance of geogenic processes is demonstrated by the abundance of silt- and sand-sized quartz grains, which entered the site primarily through a crevice at the back of the cave. RCC lacks rich anthropogenic deposits as noted at other Middle Stone Age sites in southern Africa, but anthropogenic input to the sediment is indicated by the presence of charcoal, burnt bone, lithic fragments, fat-derived char and ashes. Clay coating fragments and chaotic microstructures demonstrate that bioturbation and colluvial reworking homogenised much of the deposit and may explain the absence of preserved bedding and rarity of combustion features. Downward movement of water through the sequence, indicated by clay coatings, is the likely cause for poor bone preservation and near lack of ashes at the site, as well as fluctuations in dose rate that have complicated luminescence dating studies. Evidence for diagenesis at the site is in the form of secondary apatite and gypsum. Sedimentary structures such as channel lag deposits and (silt and sand) laminae observed in peels dating between 60 and 35 ka BP suggest a high-energy sedimentary environment, which experienced flooding events that eroded underlying deposits and deposited large volumes of sediment. This explains why some of the post-Howiesons Poort layers contain few artefacts and implies that there may have been more human activity at the site during this time than has previously been suggested.