

**Science and science-fiction in the interpretation of Acheulian sites:
taphonomic problems, behavioral models and technological hypotheses**

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The interpretation of Acheulian sites is frequently flawed because of several reasons, including lack of definition of what Acheulian is (beyond the presence/absence of the handaxe “*fossil directeur*”), the dominance of technological/typological studies over a more holistic approach (involving a thorough contextual taphonomic study of sites), the evaluation of site formation processes frequently by non-taphonomic experts (thus limiting taphonomic studies frequently to single or few variables), the lack of behavioral modeling (as was common for the older Oldowan archaeological record) and a non-scientific approach to the understanding of the role played by Acheulian technology. This leaves us with a rather limited knowledge of what Acheulian sites represent in terms of functionality and hominin behavior. A large array of interpretations of taphonomic character (e.g., the common assumption that sites in fluvial contexts have necessarily to be in derived conditions), as well as of cognitive-behavioral reconstructions (e.g., complex stone tool reduction sequences), although probable in some cases, do not resist scientific screening the way they are currently formulated. Here, some examples of these aspects will be presented through a constructive critique, which will intend to provide arguments to understand Acheulian sites, contextually, taphonomically and paleoecologically as adaptive expressions of hominin behavior. Some examples from Olduvai Gorge will be used.