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The quartzite cleavers from Atapuerca (Burgos, Spain): the standardization of shape

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The term “mental template” has been used frequently by lithic analysts, especially in discussions about Acheulean handaxes. Nevertheless, the standardization of shape not only affects handaxes but also cleavers. Within this work, we aim to analyze the whole sense of the cleaver tool-type, from several points of view: technological, morphological, and particularly functional. The archaeological samples of quartzite cleavers come from the Middle Pleistocene sites of Gran Dolina-TD10.1 and Galería (Atapuerca, Spain). They are made both on cobble and flake, using different techniques to produce the same tool-type. The presence of these instruments inside the caves is related to final stages of use and discard of large cutting tools there.

The main idea to explore is that shape standardization not only affects the morphology of tools but also their function. In this case, the type of actions performed with these instruments tend to produce small edge fracturing on their bits, removing any previous well developed polishes and other use-wear features that would be developed there. So, we propose a new low power approach, based on the 3D scanning of edges, combined with the use-wear analysis by SEM microscopy. The archaeological sample is compared with several experimental tools used in different activities, the wear of which has been monitored by means of 3D scanning of the tools before and after use and by sequential microscopic recording of the microwear.

The preliminary results highlight the good preservation of the archaeological artefacts, and effectively allow us to identify generic actions carried out by the analysed tools. So, experimental data combined with a multi-technique approach including 3D models proved to be useful to improve our knowledge on the functional role of the Acheulean cleavers.

Keywords: *Acheulean, Cleaver type, Functional analysis, 3D, Microscopy, Experimental archaeology*