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EXPERIMENTAL INVESTIGATIONS INTO FLUVIAL MODIFICATION PROCESSES OF THE EARLIER PALAEOLITHIC RECORD

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Re-worked lithic assemblages in open-air settings represent a significant component of the earlier Palaeolithic record. However their derivation creates interpretative difficulties through the loss of primary spatial and environmental associations. Furthermore, preservation of lithic assemblages can vary significantly from one site to another (e.g. contrast the locally re-worked artefacts of the Clacton golf course and the heavily abraded bifaces of the Solent River's terrace assemblages: Singer *et al.* 1973; Ashton & Hosfield 2010). While recent studies have nonetheless emphasized the value of such data (Ashton & Lewis 2002; Ashton & Hosfield 2010), the recognition of post-depositional alteration and its effect on a lithic assemblage is still an important aspect of prehistoric research, especially in the Palaeolithic.

To identify archaeologically detectable variables influencing artefact modification, this project initiated the construction of an electric motor driven 100 litre plastic tumbling barrel with funds from the 2010 John Wymer Bursary (Figure 1). Tumbling barrels are an experimental apparatus commonly used by earth scientists (Lewin & Brewer 2002) to simulate fluvial clast-clast processes rotating a charge of clasts in water, abrading them as they move. While tumbling barrel experiments have been used by archaeologists to explore rates of abrasion before, they have focused on localized contexts (e.g. Grosman *et al.* in press; Gaudzinski *et al.* 2010) of individual assemblages in specific geological contexts while others have focused on the appearance of

singular characteristics such as *arête* width (e.g. Shackley 1975; Hosfield 2001).



Figure 1. The tumbling barrel constructed with funds from the John Wymer Bursary.

The goal of these experiments has been to develop data sets for broader applications by testing the effects of a wider range of variables in detail. Experiments are currently underway on a number of experimentally manufactured core and flake assemblages and handaxe sets. Preliminary results have confirmed a number of typical breakage patterns, scar removals and edge retouch (see Figure 2) seen in other tumbling barrel experiments (Grosman *et al.* in press) and mimicked a number of other characteristics such as scratching and surface sheen seen in archaeological assemblages, such as at Barnham (Ashton 1998) and Caours (pers. obs.). Still, many of these characteristics developed differently dependent on initial artifact dimensions (a, b, c-axis and weight), tumbling time and sediment calibre in non-linear association (Chu in press.).

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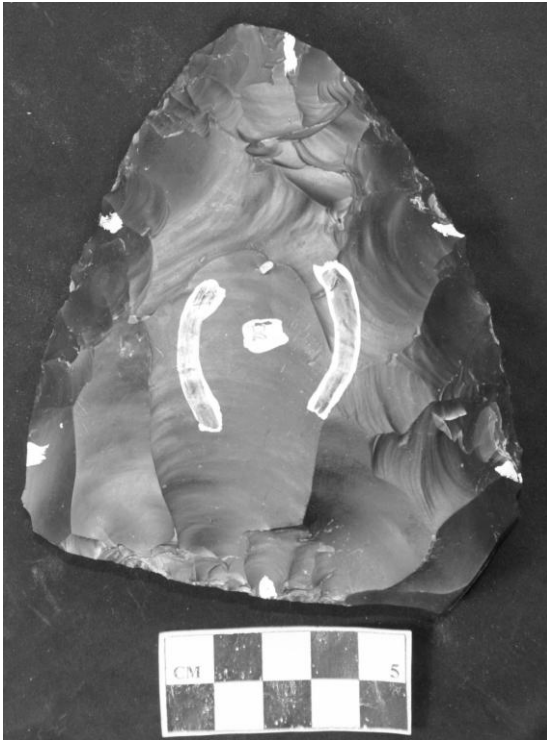


Figure 2. An experimentally manufactured handaxe.

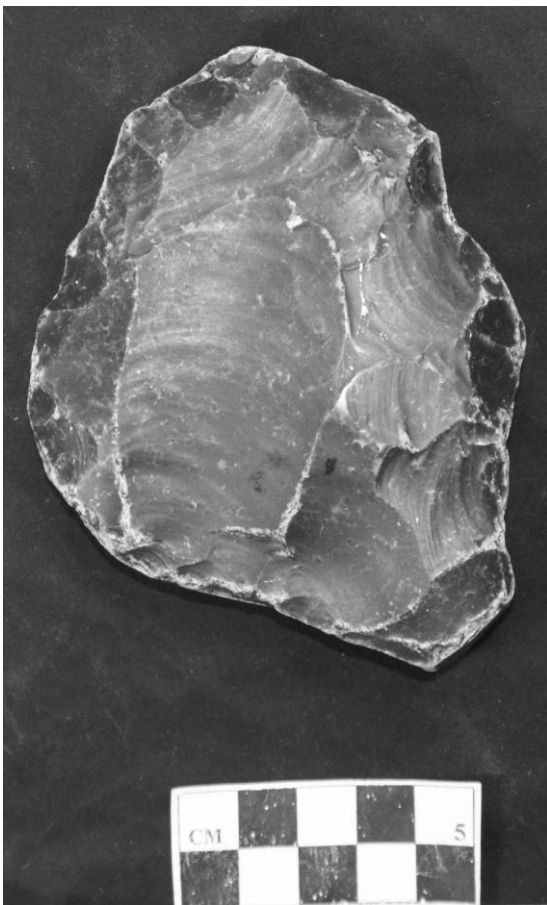


Figure 3. The same handaxe (figure 2) after four hours of tumbling.

More information will be gained as experiments continue and further investigations will consider factors such as flow velocity (barrel speed) and raw material type, as it is likely that they will also influence the type of modifications seen on artefacts. The key goal to these tumbling barrel studies is the application of these data sets to Palaeolithic collections.

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