



Large Cutting Tools from the Danjiangkou Reservoir Region, central China: Comparisons and contrasts with western and south Asian Acheulean



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ABSTRACT

The Danjiangkou Reservoir Region (DRR) in central China has been studied since 1994 and is known for its Large Cutting Tools (LCTs), with similarities to both western and south Asian LCTs of the Acheulean industrial complex. However, the origins of LCT technology in China is a much debated topic. In this paper, we address several of the major arguments used to support an indigenous development for eastern LCTs—greater thickness, a poorer Refinement Index, greater weight, and a preference for cobbles over flakes for LCT blanks. In comparisons based on a large database of Acheulean LCTs, DRR examples are shown to compare well with Acheulean technology in terms of thickness and ‘refinement,’ traits which we here link to raw material shapes and flaking properties. A relatively more frequent use of cobbles for blanks, however, characterizes the DRR and other Chinese LCTs, but there is also regional variability in this feature. Weight, on the other hand, is consistently larger for all Chinese LCTs, including those from DRR, although these fall at the low end of the range. Nevertheless, there are important features in common between Acheulean and Chinese LCTs which indicate either a common origin or periods of admixture culturally and probably physically. These features include the use of large flake blanks, the presence of cleavers in some industries, and the shaping of handaxes by both primary and secondary flaking. The influence of regional cultural traditions on Chinese material, geographic distance and limited migration routes, cultural drift, differences in subsistence ecology, and the demographics of small population sizes seem ultimately to be responsible for the differences, and they should not be used to obscure the commonalities.

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1. Introduction

In order to contribute to the discussion on the origins of handaxe technology in China, it is important to develop a systematic methodology for comparison of this more informative type with those from western and Indian Acheulean assemblages. We have proposed such a methodology and applied it in some detail to the handaxes from the Danjiangkou Reservoir Region (DRR) and Large Cutting Tools (LCTs) in general (Kuman et al., 2014; Li et al., 2014a,b,c). We prefer the term LCT to biface for both the East

Asian and Acheulean assemblages because it is a general term. It does not imply that all handaxes, cleavers and picks were used in the same way, as they were likely used in a variety of slicing, chopping, and hacking activities (including digging to cut roots) that can be grouped together as ‘cutting’ functions. In the early Acheulean of Africa, some sites are dominated by pick-like handaxes (Asfaw et al., 1992; Lepre et al., 2011). However, activities such as digging for roots or woodworking can also be considered as a cutting action. A second reason why we do not use the generic term of biface is because it over-simplifies the nature of both Acheulean and Asian LCTs. We instead prefer to record the extent of shaping more precisely and class handaxes as bifacial, partly-bifacial or unifacial (see Kuman et al., 2014 for the methodology). In this paper, we synthesize the results of our comparisons with

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Acheulean LCT technology and provide our own perspective. Our quantitative comparative data for the Acheulean derives from 23 assemblages from Africa, four from England, 10 from India, and eight from East Asia (see Kuman et al., 2014 for detailed database).

To date, handaxe-bearing sites have been documented from south to central China and in a northern region that borders central China (Fig. 1). DRR is located in central China within the south-eastern margin of the Qinling Mountains, which are traditionally used as the boundary between north and south China (with the eastern Qinling region considered to belong to central China). This distribution of handaxe-bearing sites occurs across a range of habitats with dates from at least 0.803 Ma to the late Pleistocene. This reflects a variety of successful, if ephemeral, subsistence adaptations that involved LCTs, and it also suggests that movements of the populations concerned may have been complex through time and space. However, the commonality for all sites is their context in river terrace deposits. Thus far, all are open-air occurrences, and no LCTs have yet been located in cave deposits. This distribution suggests that these populations migrated along river systems in China, practicing subsistence ecologies adapted to such environments, which today range from subtropical to temperate habitats. Although there are few site-formation studies on these sites (with some exceptions—e.g., Pei et al., 2015), the low density of artefacts in relation to the large excavated areas can nevertheless be said to reflect small and mobile populations of hominids that left a widespread but rather light footprint (see Table 8 in Li et al., 2014b for artefact densities in DRR sites). In both DRR and Bose in particular, supporting evidence for this opinion can be seen in the fact that artefact densities are low in all sites across the two large study areas

(W. Wang et al., 2014; Li et al., 2014b). Although the site contexts are not in gravels that would concentrate stone tools and especially the larger pieces such as LCTs, this is nevertheless a consistent pattern. These regions may have hosted small populations living in inter-montane basins that fostered relatively greater isolation of populations. In the northern Chinese handaxe-bearing regions such as Luonan and Dingcun, populations may have been larger and less geographically isolated. These assemblages also show clearer affinities to Acheulean technology in terms of large flake blanks for LCTs and typical cleavers (Wang, 2005; Yang et al., 2014).

2. The DRR: materials and chronology

The DRR is the largest man-made lake in Asia. Due to the construction of dams for the South-to-North Water Transfer Project, extensive surveys have been made of terrace deposits that were to be flooded. In this paper we discuss the comparative data analysed from 120 LCTs collected by C.L. in 1994 (Table 1), mainly from terraces of the Han River and secondarily from the Dan River (Kuman et al., 2014). Over two-thirds of these tools derive from Terrace 3, with the remainder from Terrace 2. Palaeomagnetic dating places the Terrace 3 deposits at <780 ka, while sedimentological analysis narrows the period to the S5–S4 palaeosol period of northern and central China, dating from 621 to 374 ka (Li et al., 2014a). Two ESR dates on sedimentary quartz at the Shuangshu site further narrow the age to 651 ± 65 ka for Layer 4 and 518 ± 52 ka for Layer 3 (Li et al., 2014b), indicating that Terrace 3 belongs to the earlier half of the Middle Pleistocene. For Terrace 2, OSL and TT-OSL results for sedimentary quartz date the deposits to 100 to 50 ka (Liu and Feng,

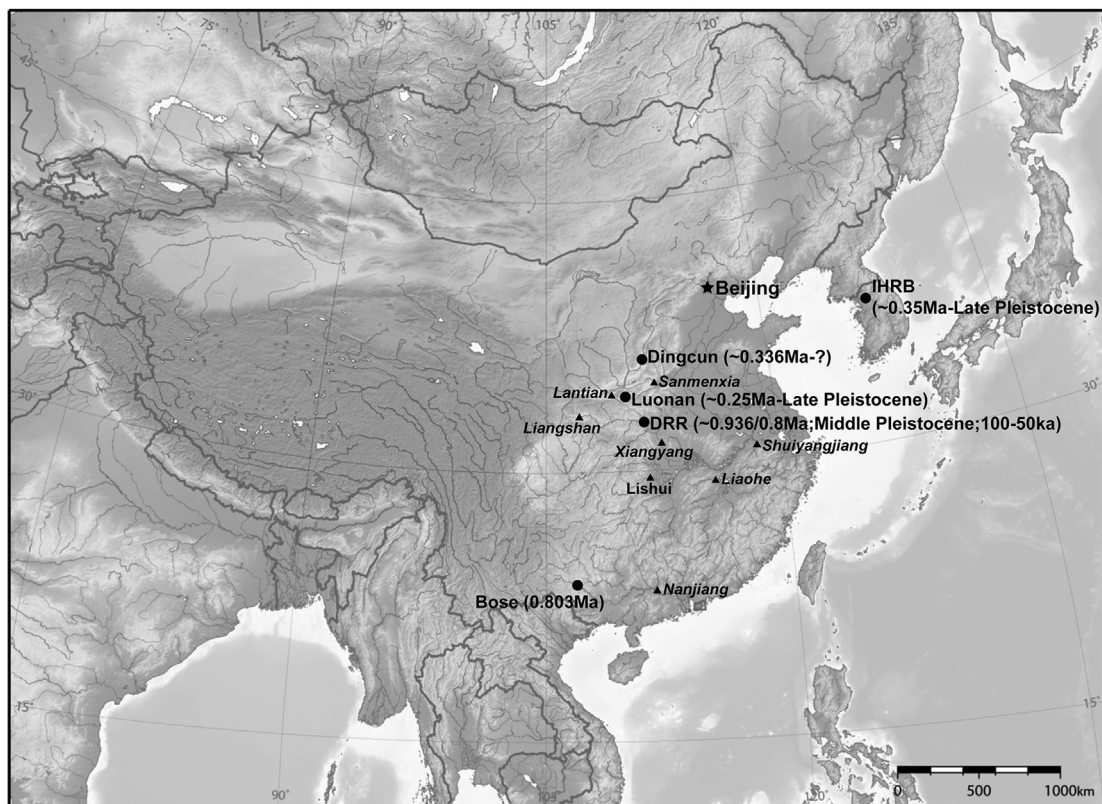


Fig. 1. Sites reported for East Asia where large cutting tools, especially handaxes, have been reported thus far. Sites in italics are less well understood and published mainly in Chinese. Bose and Nanjiang are in south China (Liu, 2013). Lishui, Liahe, Shuiyangjiang and Xiangyang are in the northern part of south China (Li, 1983; Li and Xu, 1991; Chu, 1998). Liangshan, DRR and Luonan are in central China (Huang and Qi, 1987). Sanmenxia and Dingcun are in the southern part of north China (Huang, 1964; Yang et al., 2014). DRR lies within the southern margin of the Qinling mountains, while Luonan lies within its northern margin. Sites with more than one date indicate either a range of ages within a terrace or separate ages for different terraces (e.g., DRR).

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