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New evidence and perspectives on the Upper Paleolithic of the Central Plain in China

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ABSTRACT

A rich group of archaeological materials from MIS3 to MIS2 has been discovered in recent years from Zhijidong, Zhaozhuang, Laonainaimiao, Xishi, and Lijiagou in Henan province. These records provide new perspectives on the technology and behavioral patterns in the Upper Paleolithic of the Central Plain in China. Human behavior underwent remarkable changes at the beginning of MIS 3, as seen in the long distant transport of raw material and the diversity of toolkits, as well as the enlargement of activity areas documented at Zhijidong. However, the technology of lithic reduction did not change, and a simple core-flake technology continued to be used as in the previous period. Blade and microblade assemblages appeared at the end of MIS3. A microblade technology was widely and intensively adopted in the northern part of China during the LGM and persisted until the end of Pleistocene. The change of lithic technology witnesses the development of the Upper Paleolithic and modern human adaptations during MIS3 and MIS2 in the Central Plain.

1. Introduction

The Central Plain and was a major area of human settlement in China during the Palaeolithic. In recent years, a rich archaeological record relating to MIS3 and MIS2 has been discovered, including the materials from Zhijidong (in Xingyang, Henan) (Wang, 2008a, 2008b), Zhaozhuang (in Xinzheng, Henan) (Zhang et al., 2011), Laonainaimiao (in the suburb of Zhengzhou, Henan) (Zhengzhou et al., 2012), Xishi (in Dengfeng, Henan) (Wang and Zhang, 2011) and Lijiagou (in Xinmi, Henan) (Peking University et al., 2011). These sites have yielded abundant evidence of material culture and are dated by radiometric methods. Studies of their geological and paleoenvironmental settings have been undertaken. This paper will present the new findings from these sites and provide perspectives on the Upper Paleolithic in the Central Plain.

2. Geography and chronology

These sites are located in the region of Zhengzhou (the provincial capital of Henan) and the nearby cities under its administration. The region is situated on the main route of early human migration between the east and the west, and the north and the south, and is traditionally named the Chinese Central Plain. Today, the region serves as a major transportation junction in China and East Asia (Fig. 1). The Central Plain lies in the transitional climate zone of China, of which the south is sub-tropical, and the north is temperate. Today, the annual temperature of the region is 14° C on average, and the rainfall is 640 ml. Topographically, it stands between the Hung-Huai-Hai Plain in the east and Mount Song and the Loess Plateau in the west. The landscapes and transitional geography of the Central Plain lead to a diverse ecological environment which is characterized by the frequent climatic oscillations in the Pleistocene and provided a unique niche in China for human occupation. The favorable conditions for the survival of hunter-gatherers are particularly indicated by a large number of recently surveyed and excavated sites during the middle and late part of the Upper Pleistocene (Peking University et al., 2012).

The sites mentioned in the paper are open-air, except for Zhijidong. They were formed in loess, which accumulated on a massive scale west of Central China in the Pleistocene. The chronology of the archaeological sequence and associated loess deposits is well documented at the Laonainaimiao site. A profile in the north part of the site is composed of Holocene sediment (1–2 m thick) and Malan Loess (10 m thick) from the Upper Pleistocene. Below the loess sediment there is a fluvial deposit with anthropogenic remains. The archaeological chronology corresponds to the geological sequence of paleosol S0, the upper part of Malan Loess (L1 in the

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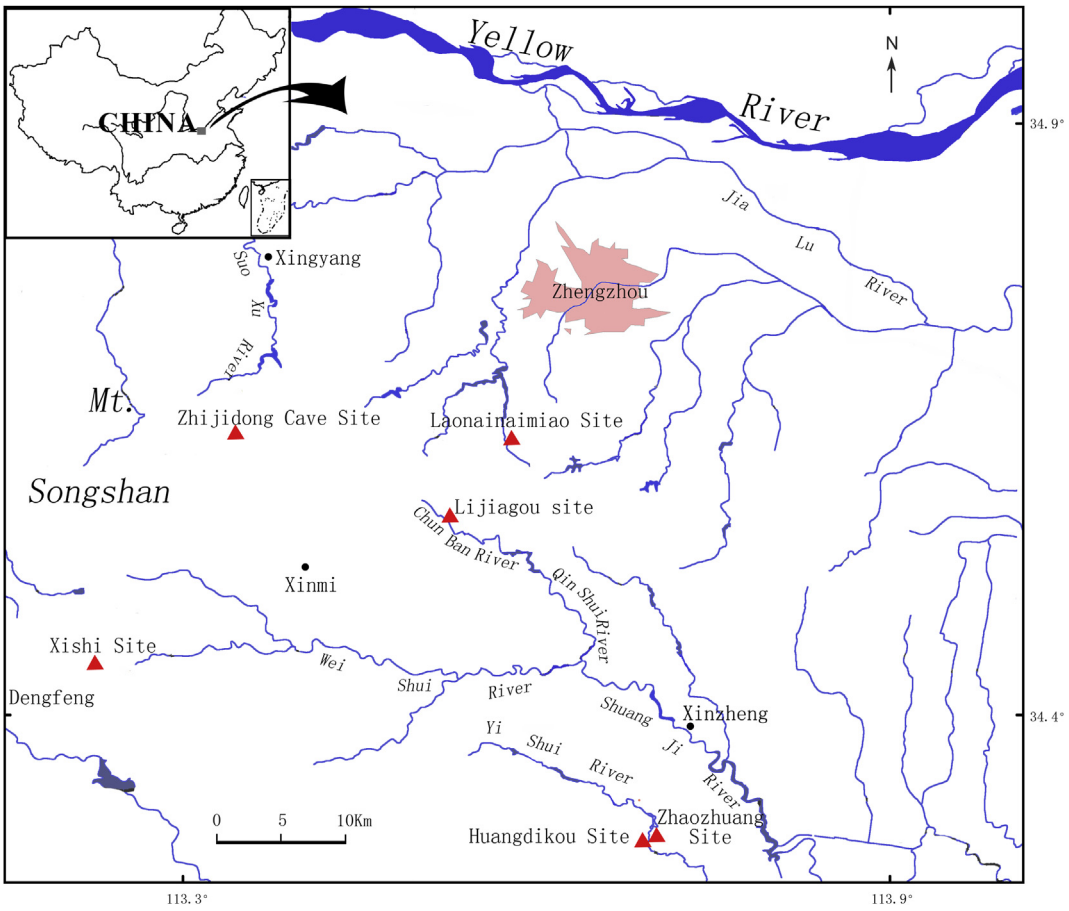

Fig. 1. Geographic distribution of the sites (marked by red triangles). (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

loess plateau stratigraphy) and paleosol L1 S1, and shows the correlation to MIS stages from MIS1 to MIS3. Zhaozhuang shows a similar chronological sequence, whereas the deposit of Xishi mainly corresponds to the upper part of the Malan Loess.

Radiometric dating by ^{14}C and/or OSL shows a consistent result with the geological chronology. Laonainaimiao and Zhaozhuang are dated to ca. 35,000 BP, Xishi to ca. 25,000 BP, and the human occupation at Zhijidong falls in the range of ca. 50,000 to 30,000 BP (Wang, 2008a, 2008b). Most of the sites were occupied during MIS 3, while Xishi and Lijiagou correspond to MIS2 and Lijiagou was occupied up to the Holocene. The chronological sequence and radiometric data offer a clue to inter-site relationships and thus set a foundation for further investigations of the Upper Paleolithic in this area (Xia et al., 2008).

3. New archaeological materials

Here we introduce the new evidence from the above sites which were excavated in a collaborative project by the Archaeological Institute of Zhengzhou and the School of Archaeology and Museology of Peking University. The findings provide important insights into the Upper Paleolithic issues in the Central Plain.

3.1. Zhijidong

Zhijidong is a limestone cave in Wangzongdian village, Xingyang city, and is located in the hill region as part of Mount Song. The cave sediment is over 20 m thick. The recently excavated part near the cave entrance is divided into nine layers. The age of the major deposit is estimated as ca. 40,000 BP according to ^{14}C and OSL dating. Comparative analysis of the cave sediment with an open-air profile near the cave indicates that human occupation at Zhijidong took place in the period when L_1S developed. Zhijidong was occupied during a warm and wet period of MIS 3. The same indication is apparent in many other sites in northern China, given the vast distribution of L_1S in the Central Plain and the Loess Plateau.

The majority of the remains from Zhijidong are lithics. Layer 8 and 9 yielded cobble tools (Wang, 2008a, 2008b) (Fig. 2), and the successive period from layer 1 to layer 7 is characterized by flake tools. Thousands of lithics were recovered from layers 1 to 7. The lithics are mainly of quartz and chert, but a few quartzite and sandstone cobbles were also used as raw materials. Chert and quartz were exploited and transported several kilometers to the site. Cores are mostly irregular and directly knapped. A few are knapped by the bipolar technique. There are over 1000 retouched pieces and these are categorized as side-scrapers, end-scrapers, notches, awls, burins and choppers. The retouch is simple and non-intensive (Fig. 2). The lower unit (layer 8 and 9) contains fewer lithics; only about one hundred pieces. The use of raw material differs from the upper part. Large pieces of quartzite and sandstone from cobbles are primarily used, and the frequency of quartz and chert decreased significantly. Direct knapping by hard hammer was used in both the lower and upper units. Core preparation and platform modifying are absent. Bipolar-knapping was occasionally used. Concerning the tool-kit, the lower unit is characterized by higher frequency of heavy tools, such as choppers.