

The Upper Paleolithic Longwangcan Site at Yichuan in Shaanxi

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A joint archaeological team, consisted of the Institute of Archaeology, CASS, and the Shaanxi Provincial Institute of Archaeology, began in 2004 to investigate the Longwangcan Site at Hukou Town in Yichuan County, Yan'an City, Shaanxi Province; and 21 localities of Upper Paleolithic were identified. Subsequently, Locality 1 and Locality 2 were excavated during September–November in 2005, and May–July in 2006, respectively. These two excavation sessions exposed an area of more than 40m² and yielded over 20,000 stone artifacts, plus some animal bones and more than 20 units of fire-using features. Based on the dating results so far, as well as comparative references from related sites surrounding, the site is estimated to 20,000–15,000 BP. Most notably, besides the discoveries of abundant human activity features, the investigations also uncovered important objects on site such as querns and edge-ground spades.

Introduction to the Site

The Longwangcan Locality 1 site is located about 580m north of the Longwangcan Village, Hukou Town in Yichuan County, Shaanxi Province; and about 30km southwest from downtown of Yichuan County. It is situated on the second terrace of the west bank of the Yellow River, a part of loess plateau at the conjunction delta of the Yellow River and Huiluogou River which is stemmed from the Gaobai Town in Hukou. Both Locality 1 and Locality 2 are located at the front and the back slopes of the terrace, respectively. The site is at 483m above sea level, about 34m higher than the current water level of Yellow River.

The region is the marginal zone of the southeast Loess Plateau, topographically consisting of Weibei Plateau and Floodplain of Yellow River, which together is a part of the mixed plateau-hills zone. The region is warm and

semi-arid and has clear four seasons. The rivers in this region are all parts of the Yellow River tribute system. Many rivers run from north to south, and the falls at the middle or lower river valley are relatively deep.

The bedrock at the Longwangcan site and adjacent areas are a fall section run from south-north representing a south-north fold in well-developed Trias Formation. The loess in this region is deposited over lowlands along the banks of Yellow River, forming a thin layer. The sedimental layers are clearly presented, as palaeo-soils were found in stripe formation. It is such lowland of loess plateau, a landscape crossing the Huiluogou River west to Yellow River, where the Longwangcan site is situated.

Excavation Methods

During the excavation at the Longwangcan Locality 1 site, we employed horizontal excavation at 1m × 1m squares in control of cultural layers. Add to the conventional recording manners, we also recorded *in-situ* variables of each specimen, such as the oblique direction, oblique angle long-axis direction, point of most appearances, and grid-north direction, all marked on each artifact before being removed. We have piece-plotted reference location of each artifact by using a Total Station. We decided to collect all of earth samples of two fired-clay floor units at two different excavation areas, in hope to gain as more evidences as possible and to lay a foundation for future research.

Stratigraphy

The Longwangcan site has been severely damaged due to constantly removal of earth by local villagers for brick-manufacture. However, in general the deposit stratigraphy remains clear. Six layers were identified at the Lo-

cality 1, appearing to be deposition in gentle slope higher in southwest. The following text is the description of stratigraphic deposits at the west profile of excavation unit:

Layer 1: plough zone, grayish-brown soil about 0.3–0.45m thick.

Layer 2: grayish yellow soil about 0.2–0.4m thick containing modern tile fragments, iron nails, and substantial cobble nodules.

Layer 3: yellowish-brown soil about 0.7–1.3m thick, containing missed remains of contemporary tile fragments and iron nails and a few chipped stone tools, microblades, burned-bones, charcoals, and rocks.

Layer 4: light yellow soil about 0.8–1.1 m thick, with stone tools, burned-bones, charcoals, and rocks.

Layer 5: yellow sandy soil about 0.6–0.9m thick, with stone tools, burned-bones, charcoals, and rocks.

Layer 6: yellowish-brown sandy soil about 1.1–1.4m thick, with stone tools, burned-bones, charcoals, and rocks.

Underneath the Layer 6 is rock bed. The top zone is consisted of large cobbles resulted from erosions, while the bottom are the Trias Formation of mixed clay sandstones in purple-brown and purple-red color and feldspathic sandstone in light-red color.

Based on the different textures, color, and contents of these stratigraphic deposits, we can determine that Layers 1 and 2 are of modern deposits. Layer 3 is a secondary deposit of Paleolithic context, resulted from sloping erosions from upperlands of the plateau. Layers 4–6 are cultural deposits of Late Paleolithic. The sediments of all layers are characterized by light yellow color, fine grain, large apertures, and vertical deposits, indicative of typical Malan loess deposits.

Major Discovery

1. Features

There are abundant human activities at the Longwangcan Locality 1 site, mainly including burned-earth floors and stone artifact clusters. More than 20 burned-earth traces are identified, most of which are in form of round or oval about 50cm in diameters and in red-brown color. Most yield

abundant charcoals and burned-bones (Figures 1 & 2). Associated with burned-earth floors are a few stone artifact clusters which can be categorized into two groups. The first group usually contains an anvil-stone surrounded by concentrated chunks, debitage and debris. The range of debris fall between 2–3mm in both length and width (Figure 3), indicative of a manufacture place for tools.

Another group, recovered beneath Layer 5, is involved probably in special human activities. More than 300 sandstone nodules were piled within less than 2 squares meters area, appearing semi-circle about 15cm high. These nodules are gray-white; most are about 3–8cm in diameter. The textures of stones are loss so as to be heavily weathered. Some seem to be burned. To its west, there is a cluster of rocks in similar size, together



Figure 1. Burned-earth floor beneath Layer 4 (06I ④2, photo taken from west to east)



Figure 2. Burned-earth floor remain (05I ④S4, photo taken from upside)

with the above-mentioned nodules to form a connected circle. One meter away at its southwest, a fire-use floor, 30cm in diameter, was recovered. Lacking of cultural material in general, only few charcoals were unearthed from the fire-use floor (Figure 4). It is so far one of rare Paleolithic human living floors identified in China.

2. Artifacts

More than 2000 lithic artifacts were recovered during excavations in 2005–2006. Besides those finely-made microblade cores, microblades, and various typed tools, a large number of lithic assemblages are consisted of nodules, chunks, debitage and debris. Categories of microblade cores include conical, cylindrical, semi-conical and wedge-shaped cores. Microliths are dominated by various types of scrapers, points and burins (Figures 5–7). Associated with these microliths assemblages are



Figure 3. Stone artifact clusters (06I ⑤ 5, photo taken from upside)



Figure 4. Stone artifact clusters (06I ⑤ 5, photo taken from west to east)

other large chipped and ground tools such as points, choppers, hammer stones, anvil-stones, grinding stone and stone querns. Grinding stones, which are made of sandstones, appear irregular round shapes and with one flat grinding surface. The shapes of stone querns seem to be rectangle or irregular round, with modified surrounding edges and a sunken trace at the middle due to the grinding (Figure 8). The discovery of ground spade is very important in Chinese Paleolithic archaeology. It is made of shale raw materials and modified into tongue-shape on the basis of layering textures of shale; the two surfaces of its tip are grounded into curve shape. It is one of the earliest ground tools in China so far, with the length of 12.7cm, width of 9.2cm and thickness of 0.8cm (Figure 9).

Compared to Europe, the arts and ornaments of Paleolithic age are rarely found in China; thus the discovery of shell ornament from Locality 1 of Longwangcan site is significant. One of such shell ornaments is rectangle in form with 3.7cm in length and 1.6cm in width. It has two parallel uni-directional perforations on the top. Two sets of denticles are located symmetrically on each side of the object; the sets near the upper part of each side consisted of 4 denticles, while the two at the lower part of each side consisted of 3 denticles (Figure 10). Another shell artifact was modified into a fan-shaped ornament with polished edges, 1.5cm in length and 1.1cm in width.

Significances of the Discovery

Based on the preliminary observations of lithic assemblages at the Longwangcan Locality 1 site, it is suggested that the lithic industry shares characterizations of northern microlithic industrial traditions: made predominantly on chert and quartz through direct- and indirect-percussion techniques, especially applying complicate indirect-percussion and pressure techniques. Furthermore, large chipped and ground stone tools such as points, choppers, hammer stones, anvil-stones, grinding stones, and stone querns co-existed in the context of microlithic assemblages. The site has been dated to 20,000–15,000 BP. Among the artifacts recovered, the discovery of the



Figure 5. Stone scraper (06I ⑥:5838)



Figure 6. Stone burin (06I ⑥:2871)



Figure 7. Stone point (06I ④:1067)



Figure 8. Stone quern (05I ④:1168)



Figure 9. Stone spade (05I ④:1126)



Figure 10. Shell ornament (06I ④:3861)

ground spade is one of important archaeological achievements to date, indicating one of the earliest ground tools in China.

Around 15,000 years ago is a period in transition from Paleolithic to Neolithic, when dramatic changes in global climates took place from cold-arid Last Glacial Period to warm-moisture Post-Glacial Period. Accompanying with this environmental change, human behavioral adaptations also occurred. Therefore, issues concerning with hunter-gatherer subsistence, settlements, and social adaptations become focused research topics in archaeology, anthropology, environment studies, zoology, biology and so forth.

At present, few archaeological sites are identified in the Middle Valley of Yellow River belonging to this period. It is exceptional to discover an archaeological site such as the Longwangcan Locality 1, which yields

abundant artifacts from primary contexts of stratigraphy. It is exciting to recover the ground spade with polished working edge, stone querns, and shell ornament, as well as the human activity floors; the latter is very rare. Therefore, these discoveries provide precious material for us to analyze and reconstruct hunter-gatherer's living environments, and to further explore their economic strategies and social conditions. In addition, the evidences from the Longwangcan Locality 1 also help us to study the origins of Chinese microliths, origins of arid-agricultures in northern China, and the transition from Paleolithic to Neolithic in the Middle Valley of Yellow River. During our excavations, we also identified 19 localities of Upper Paleolithic at both sides of Huiluogou River, which allow us to conduct systematic investigations on the time-space context of the Longwangcan site.

Note: The original report was published in *Kaogu* 考古 (Archaeology) 2007.7: 3–7, with one illustration and two pages of plate, written by Yin Shenping 尹申平 and Wang Xiaoqing 王小庆. The present version is prepared by Wang Xiaoqing and translated into English by Shen Chen 沈辰.