On the Traces of Disasters and the Building near the Square in the Lajia Settlement

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Four years of survey and excavation at the Lajia site before 2003 resulted in a number of important discoveries including several buildings that show signs of violent cleaning out during their destruction phase. This article presents several opinions related to the reasons for the remains of catastrophic events at Lajia and to issues related to seasonality and plaza architecture. It generally aims on advancing our understanding of the Lajia settlement.

A Survey of the Lajia Site and Evidence for Its Catastrophic Demise

Lajia is located on the front section of a secondary terrace on the north side of the Yellow River. Gullies formed by seasonal runoff lie on both the north and south sides of the site, which slopes downward from the northwest to the southeast. Lajia is 500 meters from east to west and 400 meters from north to south, with a total area of 20 ha. Mostly the remains correspond to typical Qijia Culture material.

A small central plaza at the Lajia settlement that is composed of a hard-packed surface lies in the middle of the site terrace. The plaza links platforms on the northeast and southeast of the site. In this area excavators have discovered 20 buildings clustered around the edges of the plaza area. Among these, the structures F1, F3, F4, F7 and F10 are aligned in a row on the northern edge of the plaza, all with doorways facing north. Another cluster comprises F13, F14, F15 and F17, which are found on the western edge of the plaza and which all have doors facing west. In addition, in the southeast part of the plaza are two houses, one of which was surface structure and the other, a stilt house, and in the northern part of the plaza excavators discovered a man-made platform (or altar) and burials.

To date, evidence for the catastrophe that befell the Lajia settlement has been found mostly in the structures in the northern part of the terrace. In this building cluster, except for the structure F1 where no human remains or objects of daily life were found, all of the other four houses contained human remains and sets of utilitarian objects. These houses were filled with clay and silt between the objects and human bones. F3 and F10 each contained the remains of two people, while F4 had as many as 14 and F7 contained four. The most detailed analysis has been conducted on the remains from F3 and F4. In F3, the two individuals were both women, huddled together up against the east wall. We can group the 14 individuals in F4 into 6 groups. With the exception of one adult male and two adult females, the others in this structure all seem to have been infants or youth. Among these, two (cluster 3) were also a pair of females huddled together up against the east wall (Figure 1). The fact that the age and sex of these individuals is more or less clear is quite special.

No remnants of postholes have been found around any of the houses that were destroyed. The walls of F15 still stand to 2–2.5 meters. The interior of the house is mostly filled with collapsed loess clumps confirming that the roof was cut out of natural loess. Taken together with the characteristics of other house structures, we can be certain that the houses of the Qijia Culture settlement at Lajia were mostly carved out of the loess soil.

The surface-structure F20 in the southeast part of the central plaza contained three rows of four postholes each and covered a total area of 5–6 meters on each side. The

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building's floor comprised a well-made hard surface, some parts of which were burned. Scattered across the floor were large numbers of stone tools, ceramics, bone tools, and lacquer objects. F21 likewise had postholes - in this case, nine in three rows of three. The structure covered 3 square meters. In this case there was no evidence of a hard-packed surface or impressions from activity, and no artifacts were found. We might conjecture that F21 was a simple stilt house. On top of both of these plaza buildings were remnants of flood deposits including a layer of sand and sandy gravel.

The Cause and Process by Which Catastrophic Remnants Were Formed at Lajia

In 2001 cracks, folds, subsidence, and sand ducts related to earthquakes were discovered in the vicinity of the site in association with flash-flood sediments. These flood sediments were all deposited on top of the evidence for the earthquakes and the collapses caused by the earthquake suggesting that the houses at Lajia were first toppled by an earthquake and then flooded.

We can find support for our understanding of the cause and process of site destruction in the death and burial circumstances observed in houses F3 and F4. Most of the deceased in F3 and F4 were found firmly associated with the floors inside the F3 and F4 structures. Only a small number of the remains had any significant amount of red clayey silt between them and the floor. For example, individual I in the center of F4 was 20cm above the floor of the house. If it was not the result of a collapse following a violent earthquake, it is difficult to imagine what circumstances might have caused all of the deceased individuals to be imbedded in the house floor as they were. Both individual III in F3 and in F4 were adult females whose bodies were pressed up against the wall of the house. In both cases their knees were bent and they were clutching infants. By all appearances they were attempting to protect these infants by using their bodies to shield them from the danger of the falling roof.

Although no bodies have been found in the houses on the southwestern edge of the terrace, nevertheless the remnants of everyday objects discovered in house F15 should also be considered evidence of the same catastrophic event. The collapse material within this structure was all clumps of loess and there was no clay or silt fill. The southwest part of the terrace directly faces the Yellow River. In cases when the Yellow River flooded, it would first affect the structures in this area. It seems that the red clay found within the F3 and F4 houses quite possibly was the result of floods from the Lujiagou stream north of Lajia Village. This is to say that it is possible that the flash flood would have happened before the flooding by the Yellow River, perhaps occurring in conjunction with the earthquake.

Furthermore, the integrity of prehistoric loess cave dwellings was not sound and apparently oscillated along with the occurrence of catastrophic events. Typical loess cave dwellings emerged first during the later Yangshao Culture and persisted into the Longshan period. Many of the prehistoric loess cave dwellings of the same sort as those found at the Lajia settlement caved in. The F10

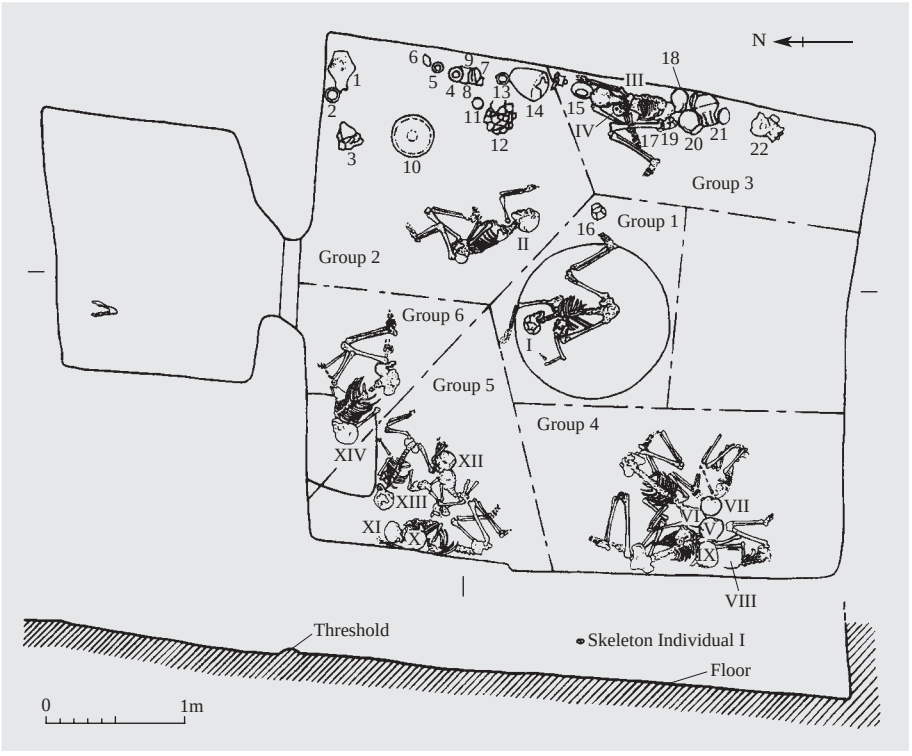

Figure 1. Plan and Section of F4 at Lajia Site (1–24. Artifacts; I–XIV. Human Skeletons)

house at the Late Yangshao Culture site of Yanggua in Ningxian County, Gansu comprises a loess cave dwelling and an entrance corridor. There are two noteworthy characteristics of this construction: First, the domed structure of the roof was not a true vault and second, the thickness of the loess roof portion was only 1.5m - much smaller than the span of the loess cave room (Figure 2). As shown by the evidence from the collapse of house F3 at the Lower Changshan Culture site of Linziliang in Caiyuan Village in Haiyuan, Ningxia, the situation was quite similar to F10 from Yanggua. The loess thickness in the roof could not have been more than 1.5m (Figure 3). These two structural characteristics of loess cave dwellings continued through the Longshan period into the era of the Erlitou Culture. Loess cave dwellings such as F556 at the Erlitou Culture site of Dongxiafeng were mostly 2m high, and the loess thickness of the roof of the cave dwelling was less than 1m (Figure 4). Even though the roofs of cave dwellings were domed, they still did not employ a vault construction.

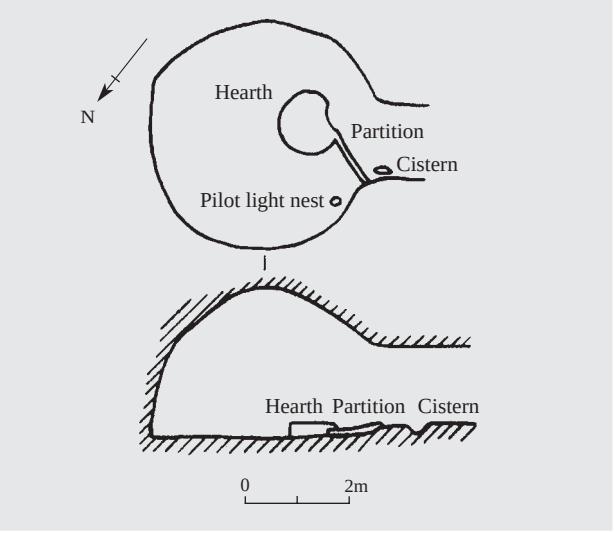

Figure 2. Plan and Section of Cave Dwelling F10 at Yanggua Site, Ningxian County, Gansu

The thickness of the loess in the roofs of cave dwellings was always less than the span of the dwelling chambers. Once the structure of the vaulted or domed roof was compromised, it could not help be given into the effects of gravity. Conversely, if the thickness of the loess deposits that comprise the roof of a cave dwell-

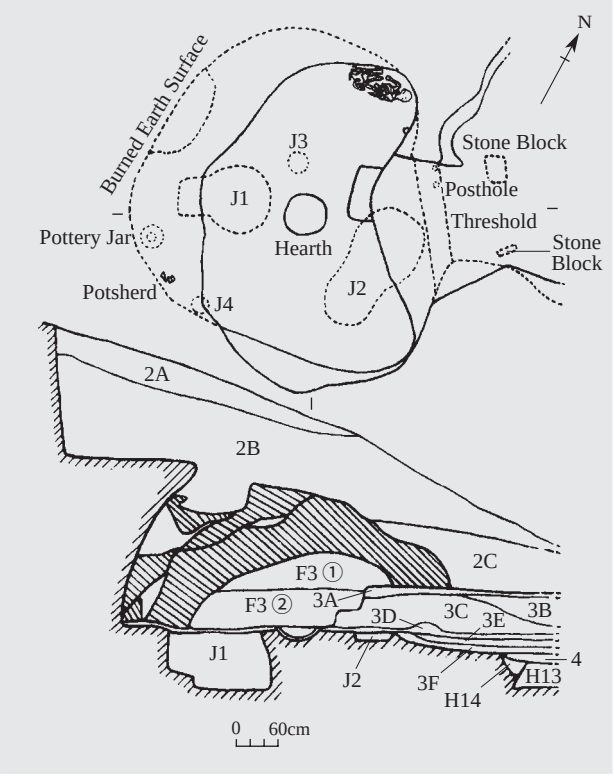

Figure 3. Plan and Section of F3 at Linziliang Site, Haiyuan County, Ningxia (the original drawing did not show the position of the infant skeleton, which would have been to the southeast of the two pottery wares)

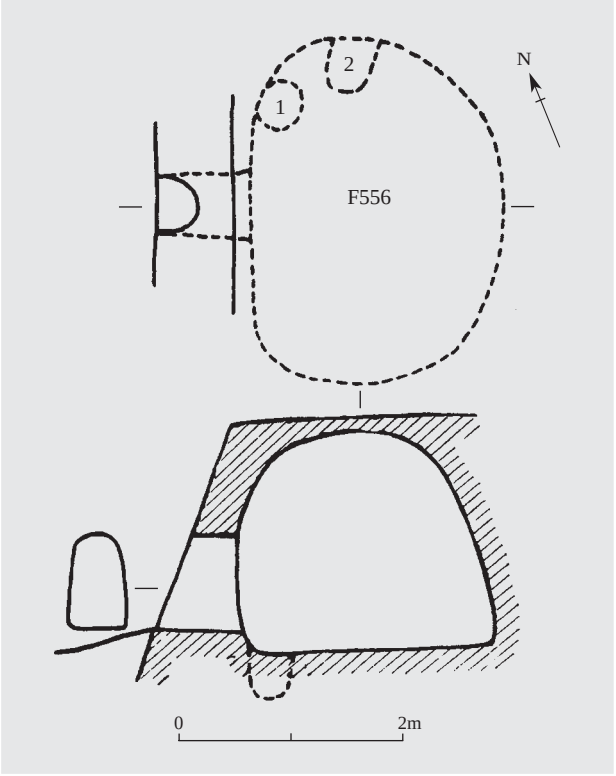

Figure 4. Plan and Section of Cave Dwelling F556 of Phase III at Dongxiafeng Site, Xiaxian County, Shanxi (1. Small pit; 2. Burned-hard floor)

ing is greater than the span of the chamber, then even if the vaulted or domed portion of the roof is damaged, it will still remain intact or suffer only minor damage due to the opposing forces of gravity and horizontal squeezing. That the remnants of the catastrophic destruction at Lajia were concentrated on the northern edge of the terrace may have been because only in this area were the loess thicknesses of the cave dwelling roofs relatively thin. This resulted in a situation where the entire roof could cave in under violent shock almost instantly. In contrast, the cave dwellings on the southwest edge of the terrace had thicker loess portions to their roofs, thereby prolonging the period that they could remain intact without completely caving in. Even if only for a few short seconds, this delay would enable people to flee from the building successfully. This might explain why F15 was discovered with many artifacts still on the floor but without human remains.

Issues Related to the Seasonality of Catastrophic Events at Lajia

Among the daily-use artifacts preserved in the F3 and F4 destruction remains at Lajia is some latent evidence that speaks to the seasonality of the events. In addition to the centrally located hearth, a stone block was found on the floor to the east of the door of F3. Around this block were remnants of red burned earth and plant ashes. It is probable that these are the remains of a temporary hearth outside the structure that had just been in use. This suggests that there was not a fixed location for the cooking being done by residents of Lajia at the time.

Based on previous discoveries, we can trace back the separation of cooking activities from residences to the Late Neolithic, but typically this only happens in the very few places where there are large, collective buildings. One example is the large F901 building at the Late Yangshao Culture site of Dadiwan in Qin'an, Gansu. There a large hearth was discovered in the center of the building's antechamber (Figure 5). The chamber with this hearth platform is neither a specialized kitchen nor is it a common residence.

Most prehistoric buildings were used as residences, but the hearths within the residences would not be used during the sweltering summer season. Instead hearths outside of the houses would be constructed, and this explanation fits our data. In sites such as Banpo and Jiangzhai, where large areas have been exposed, excavators repeatedly discovered small outside hearths in addition to the hearth areas inside the residential structures. These hearths lack any associated postholes or other evidence of a super-structure and seem to have been outdoor hearths. Outdoor hearths are common but were not used throughout the year. Instead they are a seasonal feature.

Concerning kitchenware, pottery cauldrons and stoves were commonly used together during the mid and late Yangshao periods. These were followed by the cauldron-stove sets of the late Yangshao through early Longshan period. All of these were very portable. Although these forms are seldom found in Gansu or Qinghai, we cannot exclude the possibility that other means were used to achieve some degree of portability for cooking activities. In terms of cooking areas, prior to the Longshan period they mostly involve hearth pits, while in the Longshan period the hearths are typically at the same level or higher than the living surface. Furthermore, the burned earth

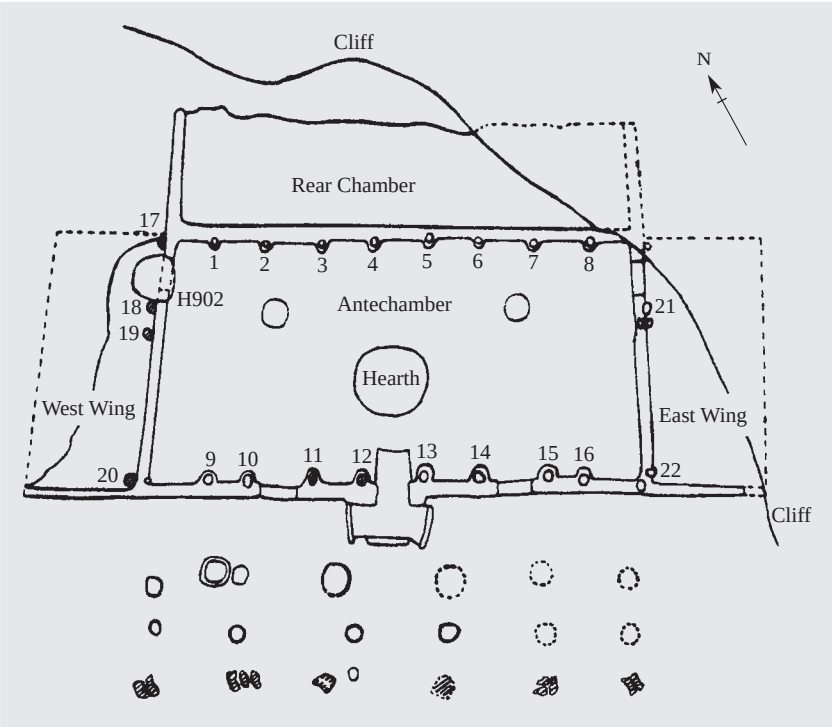

Figure 5. Plan of F901 at Dadiwan Site, Qin'an County, Gansu (1–22. Postholes)

surfaces associated with cooking in residences from the Longshan period usually are fairly intact and firm reflecting areas that were set off as a specific cooking area, showing that they would have been surrounded by walls and in the form of raised hearths. In cave dwellings at the Erlitou Culture site of Dongxiafeng, at the places on the walls 20–50cm higher than the bases of hearths, there commonly have been flues through the walls connecting to the outside. If the hearth was not an enclosed structure, it would have been very difficult for the flue to draw effectively. A raised hearth was discovered in the late Shang period house F1 at the site of Dongdongcun in Zhangqiu, Shandong which was made out of earth dug up from the original floor surface and holes for a *Li*-tripod vessel were embedded into the burned surface. Many Longshan period houses have burned cooking surfaces, but do not have raised hearths. This may relate to the function of hearths in areas with a high degree of seasonality.

Plant ashes were found in the pit-shaped hearth in the middle of the F3 house at Lajia, but without stone blocks or other vessel props. On the fired earth surface that comprises a cooking area on the floor area outside, in addition to the stone blocks for supporting firewood, plant ash was also found. In F4, although the area of the central cooking area was covered by human remains and not completely cleaned, in the area that was uncovered neither props nor ash was found, therefore it is not possible that there was a hearth platform or other cooking facilities there. Whether or not the Lajia people already had hearth platforms, they were not part of the cooking area in F4. The cooking facilities both inside and outside of F3 were both used at the same time, but objects other than the ash remains were not found on the interior hearth and apparently this was not an important cooking location. This suggests that the outside hearth was the more important location for cooking activities around the time of the catastrophe at Lajia. It would seem that neither winter nor summer would be the most likely season for these circumstances, but rather that spring or autumn would have been more so. If we add to this the knowledge that the flash flood and Yellow River flooding came after the earthquake, then most likely the disaster would have occurred during the autumn, when rains are more common.

Most of the dead discovered at Lajia were female or sub-adults. Their age range and sex ratio most likely do not reflect the general character of the Lajia population because they are not similar to normal family compositions. The remnants of the destruction event, particularly the presence of many dead individuals in the F4 structure, indicate that the earthquake occurred at night while people were sleeping. Although we might induce that adult males were away from the household, there is no evidence for either trade or warfare, and therefore we must posit the possibility of some special production activity. Autumn is the time of year that follows the season when certain wild animals breed and are therefore fattest - a particularly good time of year for hunting. In contrast, spring is the season when millet would be sown, and during this season people would not be expected to go far away. If it were autumn when the catastrophe occurred, this would explain the unbalanced sex ratio and unusual age structure of the dead population at the site, and in an indirect way this supports the conclusions concerning the season of the destruction event.

In addition, based on the position of structures F20 and F21 in the southeast part of the Lajia site's plaza, they should be contemporaneous with the loess cave dwellings. Within the area of the hard packed surface surrounded by postholes in F20, one section includes a burned-hard area, and on the surface artifacts including ceramics, bone implements, lacquer objects and large numbers of stone tools were strewn about. F20 lacked surrounding walls and was more of a shed, not well adapted to winter activity. The presence of production tools (such as stone and bone implements) and other utilitarian goods (such as pottery and lacquer objects) indicates that F20 may have been associated with some sort of production activity. In contrast, F21 lacks a hard packed surface or other evidence of activity and did not contain any artifacts. These facts suggest that the function of F21 was embodied by the above-ground portion of the structure. However, it is not necessary to claim that this was a ""*She* (Shrine for God of Soil)"or""*Mingtang* "temple. Traditionally, most ritual structures in the north that are above-ground platforms are larger than 3 sq m in size. The location, size, and form of the F21 structure seems to fit the expectations of an observation post, particularly since stilt structures are the easiest to achieve the necessary height for observing long distances.

References

Gasun-Qinghai Archaeological Team, Institute of Archaeology,

CASS 中国社会科学院考古研究所甘青工作队 (GQAT, IA thereafter). 2002. *Qinghai Minhe Lajia Shiqian Yizhi de Fajue* 青海民和喇家史前遗址的发掘 (Excavation of the Prehistoric Lajia Site in Minhe, Qinghai). *Kaogu* 考古 (Archaeology) 7: 3–5.

GQAT, IA, CASS. 2002. *Qinghai Minhe Xian Lajia Yizhi 2000 nian Fajue Jianbao* 青海民和县喇家遗址2000年发掘简报 (Excavation on the Lajia Site in Minhe County, Qinghai, in 2000). *Kaogu* 12: 12–25.

GQAT, IA, CASS. 2004. *Qinghai Minhe Lajia Yizhi Faxian Qijia Wenhua Jitan he Ganlan Shi Jianzhu* 青海民和喇家遗址发现齐家文化祭坛和干栏式建筑 (Qijia Culture Altar and Pile-dwelling Newly Discovered on the Lajia Site in Minhe, Qinghai). *Kaogu* 6: 3–6.

Institute of Archeology of Ningxia Hui Autonomous Region 宁夏文物考古研究所 *et al*. 1988. *Ningxia Haiyuan Xian Caiyuancun Yizhi, Mudi Fajue Jianbao* 宁夏海原县菜园村遗址, 墓地发掘简报 (Preliminary Report on the Excavations of the Site and Cemetery at Caiyuancun in Haiyuan County, Ningxia). *Wenwu* 文物 (Cultural Relics) 9: 1–14.

Wang, Minghui 王明辉. 2002. *Qinghai Minhe Xian Lajia Yizhi Rengu jiqi Xiangguan Wenti* 青海民和县喇家遗址人骨及其相关问题 (Human Remains from the Lajia Site in Minhe County, Qinghai and Related Issues). *Kaogu* 12: 26–28.

Postscript: This paper was originally published in *Kaogu* 考古 (Archaeology) 2007. 5: 57–68 with 11 illustrations. The present version has been prepared by the original author and translated into English by Rowan Flad 付罗文.