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THE 4000-YEAR-OLD "LONGSHAN GIANT" DISCOVERED IN SHAANXI PROVINCE, CHINA

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ABSTRACT. A human skeleton of phenomenal size was uncovered during the excavation of a prehistoric site located in the city of Shangnan, Shaanxi province, China, in 2006. The skeleton dates to 4240–4100 cal yr BP, corresponding to the Longshan culture (4400–4000 yr ago). The skeletal characteristics point to a young male 16–18 yr old with a height of 193 cm. This is the tallest skeleton ever discovered in prehistoric China, and thus we name him the "Longshan Giant." The giant appears to be of the Mongoloid race and has many physical characteristics that are similar to those of modern southern Asians. Upon closer examination, 3 drilled holes of 5 cm in diameter were found in the right parietal bone of the skull. No rationale exists yet to explain the presence of these holes.

DESCRIPTIVE BACKGROUND

During March–June 2006, we conducted excavations of a prehistoric site in Shangnan (33°26′01″N, 110°47′39″E), a town 200 km southeast of Xi'an, Shaanxi province, China. During the excavation, human skeletal remains were uncovered. According to on-site measurements, the total length of the skeleton is 193 cm (see Figure 1).

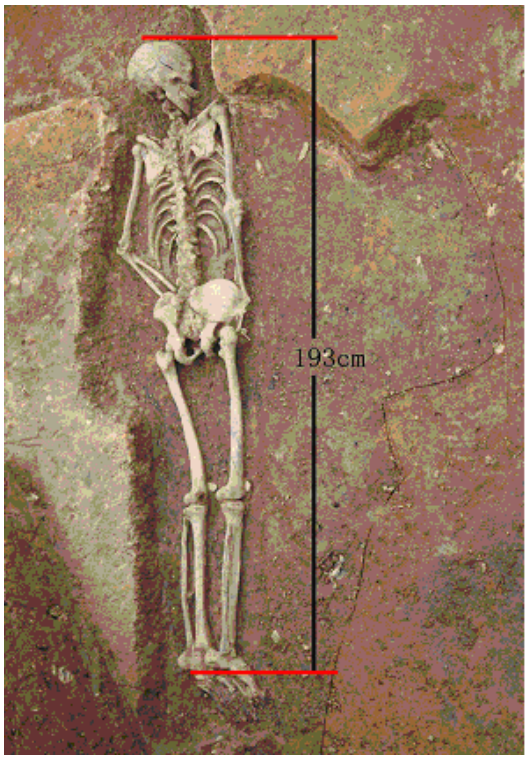

Figure 1 Original position of the Longshan Giant in the pit

The skeleton was not found in an official grave; rather, it was buried in an irregular-shaped pit near the village during the Longshan cultural period (4400–4000 cal yr BP). When unearthed, the skeleton was found lying face down with both hands under the belly. No coffin, ornaments, or other burial objects were found in or around the skeletal remains. Figure 1 shows the original position of the skeleton as discovered in the field. When we removed the dirt from the skull in the field, we noted 3 holes of 5 cm in diameter drilled into the right parietal bone (Figure 2).

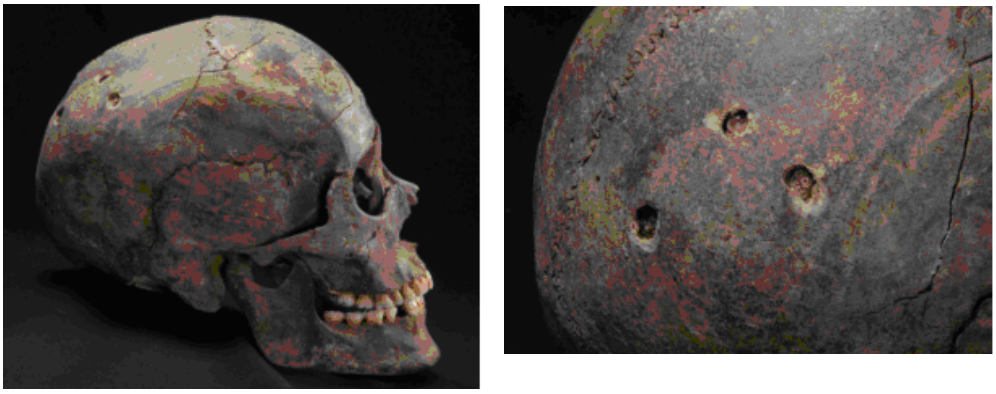

Figure 2 (A) Skull of the Longshan Giant (right-side view); (B) Close-up of the right parietal bone with drilled holes.

RESULTS AND DISCUSSION

Anatomical and Craniometric Measurements

We conducted extensive anatomical measurements on the skeleton in the laboratory of the Shaanxi Archaeological Institute. Measurements of the reassembled skeletal remains gave a length of 193 cm, confirming the size of the skeleton measured preliminarily in the field.

We also performed morphologic measurements and compared our results with coeval skeletons discovered in the area (Du and Fan 2008; Li 2008). Our results indicate that the skeleton belongs to a young male 16–18 yr old with many physical characteristics common to modern Mongolians living in South Asia. Figure 3 is a frontal view of the skull. According to our measurements, the average length of the left and right thighbone is 51.2 cm, and the average length of the left and right tibia is 42.0 cm. Using the formula for calculating the height of a male from the skeleton length (Zhu 2005), the height of this young adult is calculated to be 192.4–195.3 cm, with an average value of 194 cm, in a very close agreement with the measured value in the field.

According to physical anthropological studies of Neolithic humans in China (Li 2008), the average height of males in northern China was 167.99 cm, while the average height of females was 159.95 cm. Furthermore, Du and Fan (2008) measured the height of 17 skeletons recovered at the Xiawanggang archaeological site located in Xichuan Township, Henan province, China. The age of these skeletons ranges from 7000 to 5000 cal yr BP. The shortest one is 148 cm, with the tallest being 177 cm. The average height of these 17 skeletons is 161 ± 0.08 cm. Therefore, to the best of our knowledge, this is the tallest human skeleton discovered in prehistoric China to date, and hence we name it the "Longshan Giant."

Yet, there are still several questions awaiting an answer regarding the pathological change of the Longshan Giant. For example, is the phenomenal height of 193 cm due to abnormal physical development? Also, the giant died at a young age. The cause remains mysterious. Given the holes in the

Figure 3 Skull of the Longshan Giant (frontal view)

skull, did he die in a tribal war or due to an accident occurring during brain surgery? While trepanation was common in European and Central American Neolithic societies, the practice was unusual in Asia.

Radiocarbon Dating

To confirm the exact age of the Longshan Giant, a bone collagen sample (XA-4248) was dated in the Institute of Earth Environment, Chinese Academy of Sciences (IEECAS) using the accelerator mass spectrometry (AMS) radiocarbon method (Zhou et al. 2007). The sample was pretreated following the procedures of Yuan et al. (2000). The dating yielded an age of 3830 ± 30 yr BP (4240–4100 cal yr BP), which strongly indicates that the giant lived during the Longshan cultural period as inferred from pottery remains found in the nearby village.

Paleodietary Analyses

The Longshan culture is a very important archaeological period in prehistoric China for the emergence of complex society. However, due to the lack of archaeological materials, the economic structure of the Longshan culture is not well known, particularly in the transition zone from temperate to subtropical China. To determine the foods regularly consumed by the Longshan Giant, we conducted stable carbon and nitrogen isotope measurements on 2 samples of bone collagen of the giant in the Institute of Earth Environment, Chinese Academy of Sciences (IEECAS). Our results indicate that the average value of $\delta^{13}C$ and $\delta^{15}N$ is –8.45‰ and 8.96‰, respectively, pointing to a dietary source of terrestrial C_4 plants and/or flesh of animals eating C_4 plants. The staple crop is most likely millet, as it had already been domesticated in northern China during the early Neolithic (Barton et al. 2009).

CONCLUSION

Our discovery of the Longshan Giant provides invaluable material for pathological and dietary studies of humans during the Longshan cultural period. In summary, the skeleton discovered in the area

of Shangnan, Shaanxi province, belongs to a 16–18 year old male with many physical characteristics common to modern Southern Asians. The young man is 193 cm tall and dates to 4100 cal yr BP during the Longshan cultural period.

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