

## A Study on an Early Neolithic Site in North China

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**ABSTRACT** – *These are few sites about 10 000 BP in the early Neolithic period in North China; among these, the Donghulin site is the only one which included the remains of peoples' use of fire (hearth pits), stone implements, pottery objects, and human tombs. The excavation of the Donghulin site in 2001 provides very important information for research on people and culture in the early Neolithic period in North China. The finding of Donghulin Man has filled the gap in our knowledge of human development since the period of the “Upper Cave Man” (30 000a BP) in North China. It is also important for research on people-land relationships.*

**IZVLEČEK** – *Na severu Kitajske je nekaj zgodnjeneolitiskih najdišč iz časa okoli 10 000 BP. Med njimi je najdišče Donghulin edino, kjer so našli ostanke človekove uporabe ognja (jame za ognjišča), kamnito orodje, keramiko in človeške grobove. Izkopavanja najdišča Donghulin leta 2001 so dala pomembne podatke o ljudeh in kulturi v zgodnjem neolitiku na severu Kitajske. Najdba človeka Donghulin je zapolnila našo vrzel v poznavanju razvoja človeka od časa “Upper Cave Man” (30 000a BP) na severnem Kitajskem. Najdišče je pomembno tudi za raziskovanje povezave med človekom in pokrajino.*

**KEY WORDS** – *Early Neolithic; Donghulin Man; Pottery; Hearth pits; Man-land relationships*

### INTRODUCTION

The Donghulin site is situated in a western suburb of Beijing, on the second terrace of the north bank of Qingshui River, 25 m above the riverbed. Its location is at the meeting point of Mt. Taihang and Mt. Yanshan.

Some tombs of the early Neolithic period were found at the Donghulin site in 1966 (Zhou *et al.* 1972; Hao 1988), including three human skeletons and some burial accessories. A lot of important remains were found in 2001, including stone implements, pottery objects, human bones, and animal bones. Archaeologists also found many examples of hearth pits. These are the very first human bones and evidence of the use of fire in North China about 10 000BP. It is very important for research on early people and culture in North China in an earlier period of the Holocene

and it is also important for research on people-land relationships (Fig. 1).

### A BRIEF HISTORY OF DISCOVERY AND EXCAVATION

Students at the Department of Geology and Geography at Peking University found three human skeletons and snail shell necklaces, bone bracelets and stone implements in the west of Donghulin village in 1966. After that, the Institute of Vertebrate Paleontology and Paleoanthropology, Academia Sinica, investigated and excavated the site. Evidence shows that the human bones were from an early Neolithic period tomb and the skeletons belong to a young girl and two adult men. (Zhou *et al.* 1972). Teachers and



Fig. 1. Donghulin Site Location.

students from the Geology Department of Peking University found another skeleton and also collected some gastropod shell necklaces and stone implements while investigating on the site cross section again in 1998 (Hao S. G. et al. 2001). From July to August 2001, the School of Archaeology and Museum Studies at Peking University, and the Institute of Cultural Relics, Beijing, excavated the Donghulin site. They found hearth pits, human bones, pottery shards, stone implements, animal bones and gastropod shells (Fig. 2).

#### THE CULTURAL DEPOSIT OF THE SITE

Take T3 of the Excavation of Donghulin Site in 2001 as an example:

Layer 1: light grey soil, thickness: 5–20 cm, modern period;

Layer 2: grey yellow soil, thickness: 15–35 cm, modern period;

Layer 3: taupe (dust-color) soil, thickness: 0–35 cm, Ming-Qing Dynasties;

Layer 4: buff sand quality soil, thickness: 0–75 cm;

Layer 5: yellow sand quality soil, thickness: 15–50 cm;

Layer 6: yellow sandy soil in ash, thickness: 10–30 cm;

Layer 4, 5, 6 are sediment layers. Layer 7: dust-color soil, about 95–120 cm from earth's surface, Neolithic earlier period.

Under Layer 7 is Malan loess (Fig. 3).



Fig. 2. A view of the Donghulin Site.

#### THE AGE OF THE SITE AND DONGHULIN MAN

<sup>14</sup>C dating of human bone, shell, snail, and pottery samples was conducted at Beijing University, China and Lawrence Livermore National laboratory, USA. The results are presented in Table 1.

#### THE CULTURAL RELICS OF THE NEOLITHIC EARLIER PERIOD

The stone implements of the Donghulin site can be divided into chipped stone imple-

ments, pecked stone implements and polished stone implements, including the stone saddle-querns, stone rollers, stone chips, cores and some break pebble stones. Some stone chips have been used slightly and their blades have usage traces. There are usage traces on the stone saddle-querns and stone rollers. A small polished stone axe was also found inside the site, which was polished in part (Fig. 4).

The pottery wares include a small amount of potshards, most of them belonging to the abdominal and basal sections. Many are red-brown, and all are sand quality potteries. The degree of heating is not well-proportioned and the grains of quartz sand were mixed up in the pottery pastes. Most of them are baldish potteries, and several have raised stripes. Many are pottery jars. Some pottery shards have

Lab Sample No. <sup>1</sup>	Material	$\delta^{13}\text{C}$ (PDB)	$\delta^{14}\text{C}$ age (Yr BP)	Calibrated Date ( $\pm 1\sigma$ )(cal BC)
BA-95068	Bone	-18.44	8720 $\pm$ 170	8160(0.05)8133
				8078(0.01)8072
				8057(0.01)8050
				7969(0.92)7586
AMS-30912	Bone	-18.44	8450 $\pm$ 70	7580(0.68)7513
				7457(0.01)7456
				7507(0.27)7478
				7388(0.05)7382
CAMS-31482	Bone	-18.44	8450 $\pm$ 80	7582(0.90)7476
				7388(0.06)7380
				7460(0.04)7454
BBA-96095	Charcoal		8960 $\pm$ 70	8262(0.36)8198
				8187(0.12)8163
				8107(0.12)8082
				8045(0.20)8004
				7993(0.10)7971
BA-96091	Charcoal		9009 $\pm$ 80	8289(0.60)8198
				8184(0.08)8163
				8043(0.13)8012
				7983(0.04)7972

<sup>1</sup> Samples with a BA prefix were analyzed at Peking University, China; those with CAMS, at the Centre for AMS, Lawrence Livermore National laboratory of USA.

Tab. 1.

shed off inside and outside, so we can infer that they were made by a clay-patch pasting technique (Fig. 5).

The animal bones primarily include limbs, palatine bones, and teeth of deer. There are large quantities of gastropod shells and a small amount of mother-of-pearl.

Another important discovery of 2001 is the 5 hearth pits (ash heaps). There are many stones, ashes and animal bones in them. The basal part is Malan loess and is smooth. The stones on the upper part are in great disorder, while the stones at the base are arranged in good order, in the form of hoop. It may be for temporary cooking (Fig. 6).

#### RESEARCH ON THE LIVING ENVIRONMENT OF DONGHULIN MAN

The analysis of spore and pollen

According to the analysis of spore and pollen samples taken from the

Donghulin site, woody plant pollen increased obviously in the earlier period of Holocene Epoch (about 10.0~8.2Ka BP), being up to 55%. They include pine (*Pinus*), fir (*Taxodium*), spruce (*Picea*), hemlock (*Tsuga*) (which now exists in the subtropics), oak (*Quercus*), and walnut (*Juglans*). Compared to the later period of the Pleistocene, herbs are obviously decreasing. The combination indicates that the temperature rose significantly, the environment obviously changed and affected human activity. According to the change in the woody plant combination and the features of the herb combination, this period can be divided into two parts.

In the lower part (about 10.0~9.0 Ka BP), the *Artemisia genus*, which is suited to a dry environment, occupies the higher proportion, the individual sample inside can amount to 30%. Moreover, the family of goosefoot (*Chenopodiaceae*), sedge

(*Cyperax*), bean family (*Leguminous*), the woody fir (*Taxodium*) and *Betula genus* are in higher amounts.

In the Upper part (9.0~8.2Ka BP), the *Artemisia genus* and sedge (*Cyperax*) in the combination appears obviously to reduce, but the grass family (*Gramineae*) had been rising, and there was a little hemlock (*Tsuga*) in the woody plants. The spore and pollen features of the early segment show that the cli-

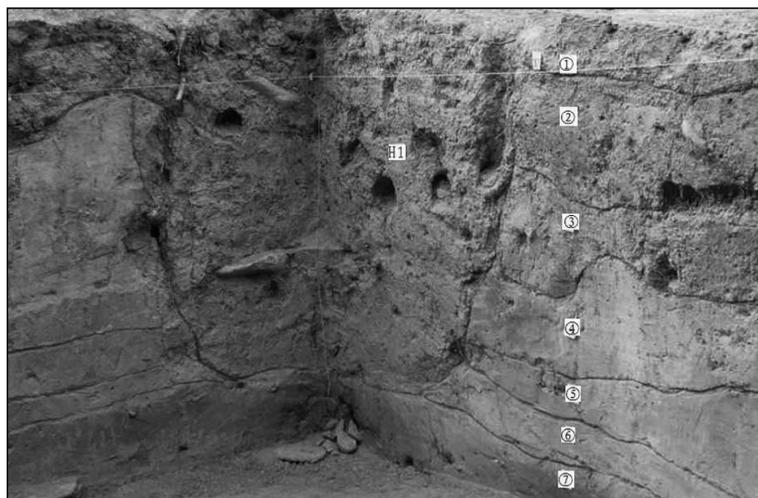


Fig. 3 A section of T3, Donghulin Site.



Fig. 4. The stone saddle-querns, stone rollers founded in Donghulin Site.

mate of the period was dry; the later segment was a little wet.

In general, during the occupation in the earlier period of the Holocene (10.0~8.2Ka BP), the region had mixed vegetation comprising conifers and broad-leaved trees, and hot spring species such as the walnut and hemlock. The appearance of herbs such as beans and sedges (*Cyperax*) reflects an essence of mountainous country meadow vegetation.

#### The Finding of *Neritina violacea*

Human skeletons were found both in 1966 and in 1998. There were grave goods such as necklaces, compound of gastropod shells identified. The gastropod shells belong to *Neritina violacea*, which only can be found in subtropical conditions now, and only can be seen along the Zhejiang in China at present (Fig. 7).



Fig. 6 The hearth pit (ash heap) at the Donghulin Site.

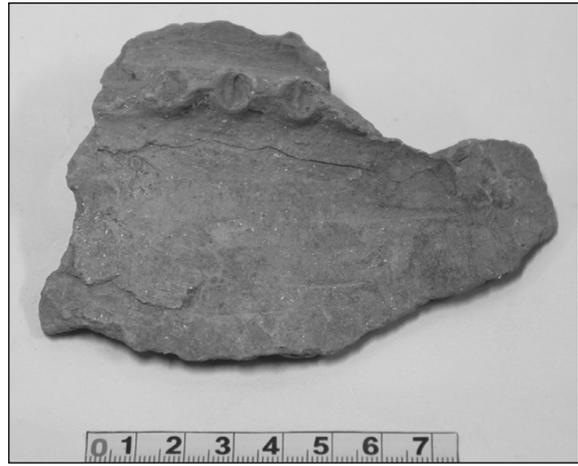


Fig. 5 Pottery from the Donghulin Site.

#### Snail analysis

In the period of the Donghulin people, the earlier period of the Holocene (10.0~8.2Ka BP), the snail is suddenly thriving. Abundant snails can be collected in the cultural deposit comprising 11 species: *Cochlicopa lubrica*, *Cathaica pulreraticula*, *Cathaica fastida*, *Opeas striatissimum*, *Pupilla cryptodon grandis*, *Kaliella sp.*, *Vallonia costata*, *Bradybaena ravida*, *Vallonia tenuilabria*, *Discus pauper* and *Macrochlamys davidi*. The gastropod fauna in the Dong-



Fig. 7. A complete necklace restored from Donghulin gastropod shells (*Neritina violacea*).

hulin Holocene interval is characterized by eurytopic snails of the North China taxa. The only taxon preferring warm and wet environments is *Opeas striatissimum*, which gradually increased; the taxon representing cool and dry climates, perhaps, is *Bradybaena ravida*, whose distribution is limited. (Hao S. G. et al. 2001).

## CONCLUSION

These are few sites about 10 000 BP from the Neolithic early period in North China; among these, the Donghulin site is the only one including relics the use of fire (hearth pits), stone implements, pottery objects and human tombs. The excavation of the Donghulin site provides very important information for research on people and culture in the early Neolithic in North China. The finding of Donghulin Man filled a gap in our knowledge of human development since the period of the "Upper Cave Man" (30 000a

BP) in North China. Research on the physical anthropology, pathology and the DNA of Donghulin's inhabitants is in progress.

According to the analysis of spore, pollen and snail samples, the climate was probably much warmer than today in Beijing, with an average annual temperature about 2–3°C higher for the Donghulin people living in the earlier period of the Holocene Epoch (10.0~8.2Ka BP). The finds of *Neritina violacea* not only indicate that the Donghulin people had an aesthetic consciousness, but also that the sphere of Donghulin peoples' trading activity may have arrived from the Bohai Sea gulf area (150 kms away).

Donghulin Man's economic activities were still hunting and gathering, and they took deer as their principle prey. The questions of what plants were collected and whether agriculture had appeared in that period still need to be researched.

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