The Neolithic Site at Shuangdun, Bengbu

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The Shuangdun site is located in the vicinity of Shuangdun Village, Xiaobengbu Township, Huaiyang District, Bengbu City, Anhui Province. The core of the Shuangdun prehistoric occupation is distributed on a triangular mound located about 200m north of the village. About 1.2 hectares of the site is preserved. The site was discovered in a cultural relics census in November 1985. Since then two seasons of excavation had been directed by the Anhui Provincial Institute of Cultural Relics and Archaeology in collaboration with the State Administration of Cultural Heritage as a component of the “Key projects of Pre-Qin archaeology in the region of Jiangsu, Shandong, Henan, and Anhui.” During the 1992 excavation, eight 5m x 5m units, a total of 300m$^2$ were excavated, yielding an assemblage of unique cultural remains.

Stratigraphy

The Shuangdun site is a single component Neolithic occupation. Both seasons of excavations were conducted in the southeastern part of the site, which is cut a north-west-southeast running gully. The east-west maximum width of the gully is about 40m and the maximum depth in the center is between 2.5m to 3.5m. The many strata of cultural occupation follow the topography and form a gradient deposition. According to the excavated units of the 1991 season, the highly complex cultural deposition comprises of 18 distinctive layers varying from 10 to 110cm in thickness. The deepest occupation is deposited up to 245cm below surface. The excavation yielded a rich assemblage of pottery sherds, artifacts made of stone, bone, antler, and shell, and ecofacts consist of animal bones, and shells of snail and mollusk.

Pottery

The majority of the pottery assemblage has a reddish-brown hue, followed by wares show red on the exterior wall and black on the interior wall. A small number have red slip on both sides. In addition, the assemblage comprises of a few black wares and grey wares. Most of the paste is tempered with fragments of shell and charcoal. A small number of quartz-tempered pottery and fine clay pottery are also found. All the pottery artifacts are hand-made. Smaller wares are molded by hands; wherein larger wares are made by joining of clay pieces. The pastes are coarse and the walls are thick; nevertheless, both the interior and exterior walls have been smoothed and buffed. The majority of the pottery vessels are unembellished (including the slipped wares). A small number of them are decorated with patterns of incision, punctuation, nipple, nail mark, appliqué, and monochrome paint. The decorative patterns are usually applied on the rims and shoulders of the vessels; wherein completely embellished vessels are rare. The domestic wares include cauldrons, cooking stands, tripod pots, small bowls (wan), large bowls (bo), steammers, vessel lids, pots, and vessel stands. The pottery assemblage also comprises of lid buttons, spindle whorls, files, net sinkers, pads, and figurines.

1. Cauldron, eight reconstructed vessels. All the cauldrons have wide mouths, deep bellies, flat bottoms and four cock’s comb-shaped ears. They can be further partitioned into pot-shaped cauldrons and bowl-shaped cauldrons according to morphology. Each sub-class has four examples.

Pot-shaped cauldron Most of the vessels of this sub-class have reddish-brown exterior and black interior and shell inclusions. They have flared mouths, restricted necks and deep bellies. Specimen 91T0621③:197 has wide rim that measures 34cm in diameter, and in-curving belly (Figure 1). Specimen 91T0719③:57 has narrow rim, crested shoulder and slanted belly. The shoulder is embellished with incised lines and double-lined triangles. The rim diameter is 26.4cm (Figure 2).
Bowl-shaped cauldron  Most of these vessels have reddish-brown exterior and black interior and inclusions of shell fragments. Mouths are unrestricted or restricted, and bellies are shallow. Specimen 91T0719⑥:64 has slightly unrestricted mouth and rim diameter at 48.8cm (Figure 3). Specimen 91T0621④:198 has unrestricted mouth and in-curving belly. Its ears are embellished with incised lines. The rim diameter measures 36cm (Figure 4).

2. Cauldron stand, four examples. The stand is used to raise the cauldron above fire while cooking. All the fragmented specimens are cylindrical-shaped. The reddish-brown and coarse paste is tempered with shell fragments. The remaining height of specimen 92T0623⑩:211 is 8.2cm. Specimen 92T0721⑤:91 is large in size, with remaining height at 15.2cm.

3. Steamer, two reconstructed examples. They have reddish-brown paste with shell inclusions. The small flat bases have circular grate holes. Specimen 91T0819②:67 is basin-shaped with unrestricted mouth, narrow rim and in-curving belly. The reconstructed orifice measures 42.2cm in diameter (Figure 5). Specimen 91T0719⑤:76 has plate-shaped body, straight rim and crested belly. Grate holes are bore on the belly and the base. The reconstructed orifice measures 28cm in diameter (Figure 6).

4. Tripod pot, two reconstructed examples. The vessels are reddish-brown on the exterior and black on the interior, and tempered with shell fragments. The vessels' legs are cone shape. Specimen 92T0622④:16 has a pot-shaped body with flared mouth, restricted neck, shallow and in-curving belly, and small flat base. Its legs are
missing. One round of rope-shaped appliqué wraps around the shoulder and the belly is completely embellished with vertical incision lines. The orifice measures 20.5cm in diameter. Specimen 91T0621 ⑤:13 has a bowl-shaped body with straight rim and crested shoulder. Its upper body is densely embellished with vertical incision lines. One round of appliqué densely embellished with incision marks is applied on the crested shoulder. The orifice diameter measures 21.2cm (Figure 7).

5. Pot, nine reconstructed examples. Most of the pots have reddish brown exterior and black interior and tempered with shell fragments. The pots can be classified into the large-mouthed group and the small-mouthed group. Two ears are attached on the shoulder. The base is flat. Specimen 92T0721:29 has an unrestricted mouth and spheroid body with orifice diameter at 11.8cm (Figure 8). Specimen 91T0719:71 has a morphology similar to that of the latter. Its remaining height is 24cm (Figure 9). Specimen 91T0819⑮:131 has reddish-brown exterior and black interior, large mouth, narrow and flared rim, shallow in-curving belly, and orifice diameter at 26.8cm (Figure 10). Specimen 92T0722⑯:25 is a black ware with straight rim and belly, and large flat base. The orifice diameter measures 19.2cm (Figure 11).

6. Small bowl (wan), five reconstructed examples. All small bowls have red slip on the exterior and black on the interior. The paste is tempered with charcoal. The morphology features in-curving belly, short ringed foot or flake ringed foot with flat base. Specimen 92T0721⑱:16 has a restricted mouth, short ringed foot, and orifice diameter at 23.2cm (Figure 12). Specimen 91T0621 ⑮:135 has straight and crested rim, the flat base shapes like ringed foot, and rim diameter at 27.2cm (Figure 13). Specimen 91T0819⑮:13 (Figure 14).

7. Basin, two reconstructed examples. They are red-
Figure 7. Type B pottery tripod (91T0621 ⑤:13)

Figure 8. Type A pottery pot (92T0721 ③:29)

Figure 9. Type A pottery pot (91T0719 ⑥:71)

Figure 10. Type B pottery pot (91T0819 ⑧:131)

Figure 11. Type B pottery pot (92T0722 ⑨:25)

Figure 12. Type A pottery bowl (92T0721 ⑨:16)
slipped pottery tempered with shell fragments, unrestricted mouth and flat base. Specimen 91T0719:83 has broad folding rim, in-curving belly and the rim diameter measures 43.4cm (Figure 15). Specimen 91T0719:14 has thin and flared rim, in-curving belly, and the rim diameter measures 31.6cm (Figure 16).

8. Large bowl (bo), seven reconstructed examples. The vessels of this pottery class feature reddish-brown color all around or reddish brown exterior and black interior, shell-tempered paste, wide mouth, and flat base. Specimen 91T0620:38 has thin rim, deep in-curving belly, and several groups of double nipple pattern distributed right under the rim, which has a diameter measures 18.6cm (Figure 17). Specimen 91T0719:111 has flared mouth and crested shoulder. Triangular incision pattern embellishes the shoulder and four buttoned-ears evenly distribute right below the shoulder. The rim diameter measures 18.6cm (Figure 18). Specimen 91T0621:160 is black all around, shapes like a small bowl, and 17cm in rim diameter (Figure 19). Specimen 91T0621:47 has restricted mouth, spheroid body, flat handle, and 14.2cm in rim diameter (Figure 20).

9. Vessel stand. The reddish-brown paste is tempered with shell fragments. The cylindrical-shaped artifacts have thick wall, flared mouth, but no base. Specimen 91T0621:29 has four circular holes embellishing the belly. The rim measures 24.5cm in diameter (Figure 21). The belly of specimen 91T0621:72 has circular perforations and densely embellished with vertical incision lines. The rim diameter is 24.6cm (Figure 22).
Figure 17. Type A pottery bowl (91T0620:38)

Figure 18. Type B pottery bowl (91T0719:111)

Figure 19. Type C pottery bowl (91T0621:160)

Figure 20. Type D pottery bowl (91T0621:47)

Figure 21. Vessel stand (91T0621:29)

Figure 22. Vessel stand (91T0621:72)
Lithics

The lithic assemblage is small. In general, the lithic artifacts of Shuangdun site are small in size and unsophisticated in production. The assemblage comprises mainly of chipped stone tools and the usage of naturally formed stones. However, a few polished tools are delicately made. Artifact classes include ax, hammer, pebble, circular implement, chopping tool, ball, utilized flake, etc. (Figure 23).

1. Ax, eight specimens. Stone axes have thin and circular bodies, and polished bi-polar curved blades. They are the more sophisticated artifacts in the lithic assemblage. Specimen 92T0622①:76 is rectangular-shaped with round edges and a maximum length of 10.2cm. Specimen 92T0723①:25 has near rectangular plan and maximum length of 8.8cm. Finally, the maximum length of 91T0719②:63 is 6cm.

2. Hammer, two specimens. They are polished, oval-shaped heavy duty tools. Some are crudely made. The maximum length of 91T0719②:158 is 12.4cm, and that of 91T0819②:129 is 11cm.

3. Quern stone, four specimens. Querns are made of sandstone and vary in shape. The concave surfaces have troughs. Specimen 91T0621②:209 has a maximum length of 14cm.

4. Circular stone, one specimen. Specimen 92T0722①:28 is dark grey in color, thin, and circular in shape, finely polished on the entire body. The diameter of the artifact is 18.4cm.

5. Ball, two specimens. Specimen 91T0819①:39 is an irregular circle in shape measuring 9cm in maximum diameter. Chipping marks are visible on the surface.

Figure 23. Stone tools

Bone, Antler and Shell Artifacts

1. Bone awls, two specimens. They are simply made that only the tips are polished. Specimen 91T0719:179 has a total length of 11 cm. Specimen 91T0719:25 has a total length of 11.2 cm.

2. Bone hairpins, four specimens. The elongated cone-shaped bodies are mostly finely polished. Specimen 92T0719:4 has a maximum length of 14 cm. Specimen 92 [surface collected]:42 has a maximum length of 10.4 cm.

3. Bone apparels, two specimens. They are made of bone plate, polished, rectangular-shaped with round corners, and perforations on the four corners. Specimen 91T0620:58 has a maximum length of 4.4 cm.

4. Hook-shaped implement made of deer antler, 10 specimens. They are cut from deer antler and polished. The hook of 92T0522:37 is 4.8 cm and the handle measures 6.2 cm in length. The hook of 92T0723:5 is 3 cm and the handle is 4.8 cm in length.

5. Shell artifacts. The shell artifact assemblage is large, but simple in modification. In most of the examples, a section of a mollusk shell is cut and the thin edge of the shell is used as cutting blade. The remaining part of the shell is not processed or slightly modified, leaving visible cut mark. A few of the shell artifacts show signs of material selection and sophisticated processing.

Signs

The signs yielded from Shuangdun site are predominantly found on the exterior walls of the bases of the ringed foot of pottery bowls. A few are found on that of pedestal bowls. They are produced with significant skill with incision or pressing methods, showing indented marks. Moreover, a few show relief of the signs, which are likely produced by molding or cutting method. A great number of signs have been recovered from the site, indicating the complexity and the richness of the representation system. The structures of the signs include single line, double lines and multiple lines. Furthermore, composite signs are made from combining different signs that occur independently. The following are illustrative examples.

Fish sign, three examples. Specimen 91T0621:83 is a single-lined script of the fish. The diameter of the base of ringed foot in which the sign was etched is 9 cm (Figure 24). Specimen 91T0719:32 is a similar fish sign, but has multi-lined structure. The diameter of the ringed foot is 8.4 cm (Figure 25).

Pig sign, two examples. Specimens 91T0620:15 is a depiction of a pig in walking motion. The ringed foot diameter is 6.8 cm (Figure 26). Specimen 91T0819:73 is a composite sign involves the representation of pig and house. The ringed foot diameter is 8.4 cm (Figure 27).

Silk worm, cocoon and silk sign, three examples. Specimen 92T0722:43 is a composite representation of cocoon and leaf. The ringed foot diameter is 9 cm (Figure 28). Specimen 91T0722:17 constitutes the sign of cocoon, curve lines and rectangle inscribed on a ringed foot base that measures 9 cm in diameter (Figure 29).

Leaf vein sign, two examples. Specimen 92T0723:20 is inscribed on a ringed foot of 7.6 cm (Figure 30). Specimen 92T0723:54 depicts several sets of leaf veins. The remaining ringed foot is 9 cm in diameter (Figure 31).

Flower petal sign, one example. Specimen 92T0721:19 involves four symmetric sets of petal and rectangle. The diameter of the ringed foot is 9.2 cm (Figure 32).

Triangle sign, one example. Specimen 91T0621:109 is found on a ring-footed base that measures 7.6 cm in diameter (Figure 33).

Rectangle sign, five examples. Specimen 92T0721:40 is a composite sign of rectangle and triangle. The ringed foot measures 8 cm in diameter (Figure 34). Specimen 91T0819:122 depicts multi-lined rectangle and curve lines. The strokes of the outer rectangles are broad, wherein those of the inner rectangles are thin. The diameter of the ringed foot is 8 cm (Figure 35).

Cross sign, eight examples. Specimen 92T0722:51 is etched on a ringed foot of 6.8 cm diameter (Figure 36). Specimen 91T0819:171 is a composition of cross and circle etched on a circular pottery plaque that measures 5.8 cm in diameter (Figure 37). Specimen 92T0721:36 is a double-lined cross inscribed on a ringed foot of 8 cm diameter (Figure 38).

Net sign, four examples. Specimen 92T0722:40 shows cross-hatching pattern on a ringed foot that is 8.4 cm in diameter (Figure 39). Specimen 91T0621:105 shows grid pattern inscribed on a ringed foot that is 7 cm in diameter (Figure 40).

Straight line, five examples. They include the combinations of one to three straight lines. Specimen 92T0722:52 is a single straight line etched on a ringed foot of 8.5 cm diameter (Figure 41). Specimen 92T0620:27 has three straight lines. It is found on a
Figure 24. Fish sign (91T0621 :83)

Figure 25. Fish sign (91T0719 :32)

Figure 26. Pig sign (91T0620 :15)

Figure 27. Pig sign (91T0819 :73)

Figure 28. Silk worm, cocoon and silk sign (92T0722 :43)

Figure 29. Silk worm, cocoon and silk sign (91T0722 :17)
Figure 30. Leaf sign (92T0723):20

Figure 31. Leaf sign (92T0723):54

Figure 32. Flower petal sign (92T0721):19

Figure 33. Triangle sign (91T0621):109

Figure 34. Rectangle sign (92T0721):40

Figure 35. Rectangle sign (91T0819):122
Figure 42. Straight line (92T0620:27)

Figure 43. Semi-circle and semi-rectangle sign (92T0723:33)

Figure 44. Semi-circle and semi-rectangle sign (92T0723:69)

Figure 45. Circular sign (91T0819:23)

Figure 46. Circular sign (91T0719:62)

Figure 47. Curve line sign (92T0721:46)
ringed foot base that is 8.4cm in diameter (Figure 42).

Semi-circle and semi-rectangle sign, seven examples. Specimen 92T0723⑦:33 is a composite sign of semi circle and two pairs of cross-hatching lines. The diameter of the ringed foot measures 8.4cm (Figure 43). Specimen 92T0723⑦:69 is a composite sign of a single-lined semi rectangle and two straight lines. The diameter of the ringed foot base of the vessel measures 8.4cm diameter (Figure 44).

Circular sign, five examples. Specimen 91T0819⑪:23 is inscribed on a ringed foot of 7.2cm in diameter (Figure 45). Specimen 91T0719⑫:62 is a composition of grid and concentric circles inscribed on a ringed foot measuring 7.2cm in diameter (Figure 46).

Curve line sign, four examples. Specimen 92T0721⑪:46, etched on a ringed foot of 8.8cm diameter, has double curve lines (Figure 47). Specimen 91T0722⑩:11 is a composite sign of multiple curve line pattern, two triangle and straight lines. It is applied on a ringed foot of 8.8cm in diameter (Figure 48).

House sign, four examples. Specimen 92T0723⑩:49 shows a button on the tip of a house roof. It is etched on a ringed foot of 8cm diameter (Figure 49). Specimen 92T0523⑪:168 is etched on a ringed foot of 8.8cm in diameter (Figure 50).

Conclusions

The Shuangdun site yielded an assemblage of unique artifacts, distinguishing it from the assemblages of other Neolithic cultures. This assemblage of material culture is typical among the assemblages of Neolithic sites in the Huai Valley. As a result, it is being recognized as the “Shuangdun Culture” in the archaeology community. Its discovery fills the gaps of the culture history in the middle reaches of Huai Valley. To date, Shuangdun Culture is one of the earlier Neolithic depositions ever discovered in the Mid-Huai region; therefore, it is significant in the building of the culture history of the Mid-Huai and the cultural pedigree of Chinese prehistory. The discovery of Shuangdun Culture is a breakthrough development of the archaeology of Huai Valley. Once and again, it suggests that the Huai Valley was one of the origins of Chinese civilization.

The Shuangdun Neolithic site has been excavated at three different times, yielding more than 600 representational signs. They are early in dates, large in number, diverse in type, rich in contents, and complex in structure. They have been collectively named as
“Shuangdun signs.” They can be partitioned into pictographs and geometric glyphs. The structure of the signs includes single line, double lines, multiple lines, and composite sign, constituting a mature system of representation. In addition, more than 80 signs had been recovered from the lower level of Houjiazhai, a site located in the distribution zone of Shuangdun Culture. When these discoveries are taken together, they suggest that the Shuangdun signs bear the nature and functions of writing. They had significant impacts on the formation and development of the Chinese writing system and should be regarded as one of the origins of Chinese writing.

The Shuangdun people was subsisted on a broad spectrum adaptation that comprised mainly of hunting and fishing, supplemented by farming, foraging and animal domestication. Imprints of rice grains are seen on the fired clay nodules of the site. The stone axes, stone shovels and shell cutters recovered are farming tools. In addition, the circular stones and pestles are indicative of grain processing activities. The pig bones yielded have been identified to be domesticated. The importance of hunting and fishing in the Shuangdun subsistence is attested by the rich ecofact assemblage that includes large number of both terrestrial and aquatic faunas, the rich hunting-fishing tool assemblage that includes net sinkers and arrowheads, and the composite sign of fish and net. The foraging economy is indicated by the hook-shaped implement made of deer antler and a variety of tools made of shell and stone.

Five charcoal samples were collected during the 1991 excavation and had been dated by the Radiocarbon Laboratory of the Institute of Archaeology, the Chinese Academy of Social Sciences. Their results indicate that the absolute dates of the Shuangdun occupation are in the neighborhood of 7000 BP.

Notes: The original report was published in Kaogu Xuebao 考古学报 (Acta Archaeologica Sinica) 2007.1: 92–126. It contains 20 figures and 12 pages of plates. Kan Xuhang 阚绪杭 and Zhou Qun 周群 are the original authors. The present abridgement is prepared by the first author and translated into English by Lee Yun-Kuen 李润权.