

A study on the Neolithic turquoises in China

Xiaoxia Pang*

* Institute of Archaeology, Chinese Academy of Social Sciences, Beijing 100710. Email: xiaoxiap04@163.com.

Keywords: Gemstone–archaeology–Neolithic Age; turquoise (mineral)–China–history.

Abstract

The turquoise objects of the Neolithic Age in China are mainly unearthed in the seven regions: the Central Plains, the Haidai cultural zone, the Gansu-Qinghai-Ningxia region, the Northern Frontier Zone, the upper and middle reaches of the Yangtze River, the lower reach of the Yangtze River and the South China. Their main functions are ornaments and burial objects, and their distribution was expanding constantly from the early to the late Neolithic Age: in the early period, they were only seen in the Central Plains and the Northern Frontier Zone; down to the late period, they were found in all of the seven regions. The forms and types of the turquoise objects were changing from simple to complex and from single object to parts and adornments inlaid or attached to other objects. At the beginning, the manufacturing techniques were relatively simple, but the engraving skill appeared. The turquoise objects were mainly unearthed from burials; when they just emerged, they were not the symbols of the statuses, positions and the wealth as well as genders and ages of the tomb occupants. However, during the Longshan Age, in some regions the turquoise was attached to some exquisite utensils or implements which might be used as ritual instruments, and began to become symbols of statuses and ranks, which was the most obvious in the Haidai area. As for the resources of the turquoise, it is still to be explored that they were imported from the peripheral area of present-day China or obtained locally.

Discovery and classification

As one of four gems that ancient Chinese considered as jade, turquoises, especially those unearthed from Neolithic sites, were studied much less than the other three. The scholars who previously studied ancient turquoise were trained with geological and mineralogical background, thus could have misinterpreted archaeological data, or chronological data, or other associated materials within archaeological contexts. This study is based on the new data reported from archaeological sites up to publication date of December 2012, and tried to provide a comprehensive review on turquoise technology and

craftsmanship in Neolithic.

Current archaeological data suggest that Neolithic turquoises were primarily found in seven regions as follows. Areas of Xinjiang, Yunnan, Guizhou, Tibet, and western Sichuan lack of turquoises discovery so far due to scarcity of archaeological sites. Although there are abundant Neolithic sites in central and northern Shanxi, as well as Hebei, Tianjin and Beijing, there are few discoveries of turquoises reported in these regions.

1. The Central Plains. At present the earliest turquoise object is unearthed from the sites of the Peiligang Culture in Henan Province. Most turquoises were recovered from the Jiahu Site in Wuyang, others from Peiligang Site in Xinzheng, Shuiquan Site in Jiaxian, Shigu Site in Changge, etc. Other turquoises belonging to Dadiwan Culture were also found from the Longgangsi Site in Nanzheng and the Beishouling Site in Baoji, both in Shaanxi Province.

During the Yangshao Age, sites where turquoises were recovered include Longgangsi, Beishouling, Jiangzhai in Lintong District, Xi'an and Hejiawan in Xixiang, all in Shaanxi Province and Xiawanggang Site in Xichuan, Dahecun Site in Zhengzhou, Wangwan Site in Luoyang, Laofengang Site in Xixia, all in Henan Province, etc.

During the Longshan Age, there seems to be a decrease in use of turquoises in the Central Plains, but it is likely due to the statistic method based on numbers of objects decorated with turquoises, rather than numbers of turquoises themselves in the statistics in previous period. Those decorated items with turquoise inlay were primarily found at Huxizhuang Site in Wugong, Shaanxi, Xiawanggang Site in Xichuan, Wangchenggang Site in Dengfeng, and the Phase III of Cuoli Site in Luoyang, all in Henan. They are also found at Shizuitou Site in Baoji, Shimao Site in Shenmu, both in Shaanxi Province, Xiajin Cemetery in Linfen, Taosi Site in Xiangfen and Qingliangsi Cemetery in Ruicheng, all in Shanxi Province, among which those recovered from the Taosi Site are of unique features (Figure 1).

2. The Haidai cultural zone (the Eastern Yi cultural zone centered by Mount Tai): the earliest turquoise in this region was discovered from sites of the Dawenkou Culture, including Dawenkou Site in Tai'an, Wangyin Site in Yanzhou and Yedian Site in Zoucheng, all in Shandong Province and Huating Site in Jiangsu Province.

Entering the Longshan Age, the numbers of turquoises used for inlaid objects are increased but the numbers of single turquoise objects are fewer than that in the previous period. At present, those turquoises-decorated objects were discovered from Zhufeng Cemetery in Linqu, Liangchengzhen Site in Rizhao and Sanlihe Site in Jiaoxian. In particular, the turquoise head ornament found

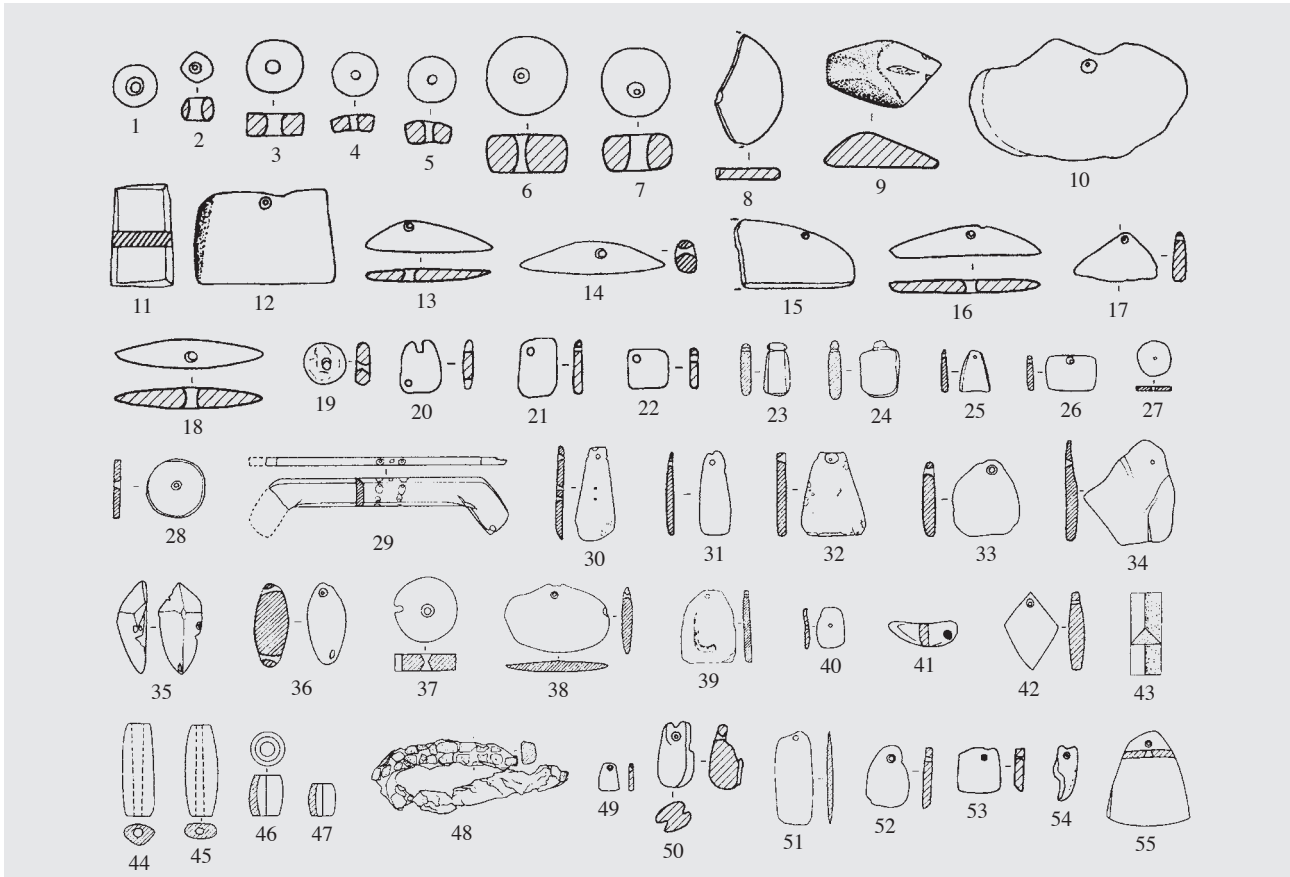


Figure 1 The turquoise objects unearthed in the Central Plains.

1. Perforated circular ornament (M58:6); 2. Perforated circular ornament (M342:13); 3. Perforated circular ornament (M275:15); 4. Perforated circular ornament (M385:5); 5. Perforated circular ornament (M385:4); 6. Perforated circular ornament (M274:1); 7. Perforated circular ornament (M58:4); 8. Perforated circular ornament (M273:1); 9. Irregular-shaped ornament (M58:10); 10. Irregular-shaped ornament (M67:1); 11. Square pendant (M115:5); 12. Square pendant (M58:9); 13. Triangular pendant (M243:3); 14. Triangular pendant (M282:1); 15. Triangular pendant (M58:5); 16. Triangular pendant (M243:4); 17. Triangular pendant (M58:12); 18. Shuttle-shaped ornament (M121:12); 19. Bead (H6:2); 20. Flake-shaped ornament (M6:3); 21. Rectangular ornament (M6:3); 22. Square ornament (M13:4); 23. Trapezoidal ornament (M134:6); 24. Trapezoidal ornament (M309:20); 25. Trapezoidal ornament (M15:1); 26. Rectangular ornament (M214:6); 27. Circular ornament (M282:6); 28. Circular ornament (M282:7); 29. *Huang*-shaped subsidiary ornament (M314:5); 30. Ax-shaped ornament (M276:9); 31. Trapezoidal ornament (M385:3); 32. Trapezoidal ornament (M309:22); 33 and 34. Irregular-shaped pendants (M309:21 and M394:8); 35. Trihedral ornament (M123:18); 36. Shuttle-shaped ornament (M83:2); 37. Perforated circular pendant (M12:10); 38. Oval pendant (M19:3); 39. Trapezoidal ornament (T2 ⑥ :14); 40. Rectangular ornament (M228:1); 41. Fish-shaped ornament (T11 ⑤ B:92); 42. Lozenge-shaped ornament (H217:1); 43. Triangular prismatic ornament (T11 ⑤ B:91); 44 and 45. Tubular beads (M2:9 and M2:10); 46 and 47. Tubular beads (T15 ③ :63 and T15 ⑧ :276); 48. Bracelet (M136:3); 49. Trapezoidal pendant (M176:1); 50. Pendant (M211:2); 51. Rectangular pendant (M686:9); 52. Trapezoidal ornament (M686:7); 53. Square ornament (M45:5); 54. Irregular-shaped ornament (M45:6); 55. Trapezoidal ornament (M45:4).

(1–18. From Jiahu Site in Wuyang, Henan; 19. From Shuiquan Site in Jiaxian, Henan; 20–22. From Shawoli Site in Xinzheng, Henan; 23–36. From Longgangsi Site in Nanzheng, Shaanxi; 37 and 38. From Hejiawan Site in Xixiang, Shaanxi; 39. From Lingkou Site in Lintong District, Xi'an, Shaanxi; 40. From Beishouling Site in Baoji, Shaanxi; 41–43. From Dahecun Site in Zhengzhou, Henan; 44 and 45. From Shizuitou Site in Baoji, Shaanxi; 46 and 47. From remains of Longshan Age at Xiawanggang Site in Xichuan, Henan; 48. From Xiajin Site in Linfen, Shanxi; 49–52. From remains of Yangshao Age at Xiawanggang Site in Xichuan, Henan; 53–55. From Wangwan Site in Luoyang, Henan.)

at Zhufeng Cemetery is the most well-known (Figure 2).

3. The Gansu-Qinghai-Ningxia region. The earliest turquoise identified at the upper reach of the Yellow River was from sites of early to middle phases of Majiayao Culture, primarily from the Zongri Site in Tongde County. Comparatively speaking, this region yields so far the most frequency of turquoise in Neolithic China, mostly from the sites that are affiliated with Banshan and Machang Types of the Majiayao Culture, especially from the Liuwan Site in Ledu, Qinghai. Because at present the late Qijia Culture is considered as part of Bronze Age, the turquoise presences at Qijia sites were counted for either from the sites dated to the early to middle phases or date to the Qijia Culture without further periodization. Among Qijia sites, turquoises were recovered from the Huangniangniangtai Site in Wuwei and the Dianhe Site in

Guyuan (Figure 3).

4. The Northern Frontier Zone. The earliest examples were found at remains of Phase I (Culture) of Beifudi Site in Yixian County, but the most turquoise objects were unearthed at the sites of the late Hongshan Culture and mid Xiaozhushan Culture, including Hutougou Site in Fuxin, Niuheliang Site in Jianping, the Dongshanzui Site in Harqin Left County, the Guojiacun Site in Dalian, Beigou Site in Xiuyan, all in Liaoning Province.

Turquoises of the late Neolithic Age were found at Danangou Cemetery in Chifeng as well as in Nan Baoligaotu Cemetery in Jarud Banner, both in Inner Mongolia (Figure 4).

5. The upper and middle reaches of the Yangtze River. There are a few turquoises found from sites of the Daxi Culture including Daxi in Wushan, Chongqing,

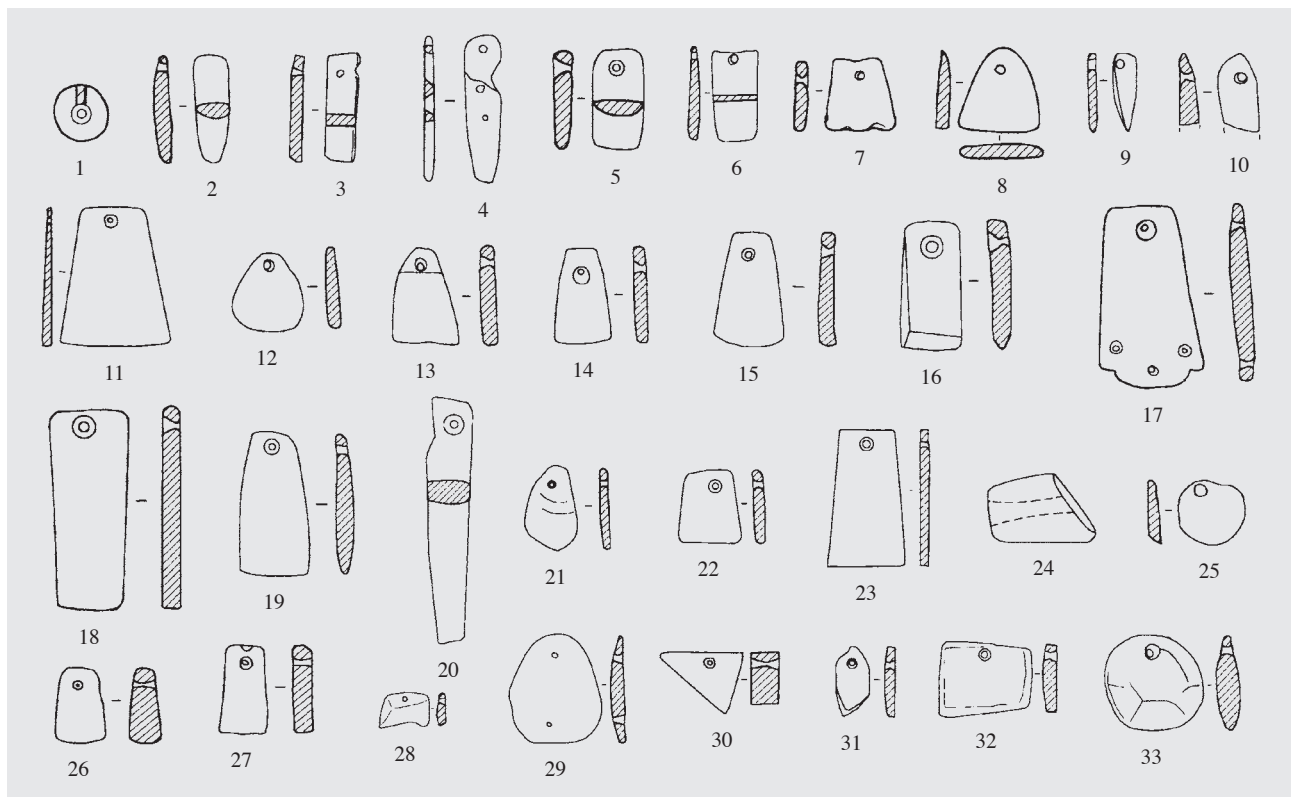


Figure 2 The turquoise objects unearthed in the Haidai cultural zone.

1. Circular pendant (M151:1); 2. Quasi-rectangular pendant (M263:12); 3–6. Rectangular pendants (M2304:7, M2288:2, M263:1 and M2300:1); 7. Square pendant (M2272:2); 8. Quasi-triangular pendant (M2511:4); 9 and 10. Irregular-shaped pendants (M2304:6 and M171:9); 11. Trapezoidal pendant (M2592:1); 12. Quasi-triangular pendant (M18:25-1); 13. Quasi-trapezoidal pendant (M20:65-1); 14. Trapezoidal pendant (M18:25-2); 15. Ax-shaped pendant (M20:65-2); 16. Quasi-ax-shaped pendant (M19:3); 17 and 18. Quasi-trapezoidal pendants (M18:26-1 and M18:26-2); 19. Trapezoidal pendant (M47:44); 20. Quasi-rectangular pendant (M22:13); 21. Fish-shaped ornament (M54:1); 22 and 23. Trapezoidal ornaments (M85:15 and M85:17); 24. Tubular ornament (M228:1); 25. Subsidiary ornament (M12:1); 26 and 27. Pendants (M41:1-2); 28–33. Perforated pieces (M10:15).

(1–11. From Wangyin Site in Yanzhou, Shandong; 12–18. From Huating Site in Xinyi, Jiangsu; 19–23. From Yedian Site in Zoucheng, Shandong; 24. From Sanlihe Site in Jiaoxian, Shandong; 25. From Dafanzhuang Site in Linyi, Shandong; 26 and 27. From Dayishan Site in Guanyun, Jiangsu; 28–33. From Dawenkou Site in Tai'an, Shandong)



Figure 3 The turquoise objects unearthed in the Gansu-Qinghai-Ningxia region.

1. Flat bead (M606:4); 2–5. Tubular ornaments (M615:2, M493:1, M693:1 and M653:1); 6–9. Quasi-trapezoidal ornaments (M606:10, M512:5, M603:10 and M519:4); 10. Irregular-shaped ornament (M685:4); 11 and 14–16. Rectangular ornaments (M678:1, M421:4, M607:3 and M474:1); 12. Knife-shaped ornament (M488:10); 13. Ax-shaped ornament (M689:1); 17, 18 and 20–22. Tubular ornaments (M1017:21, M1156:35, M265:4, M1337:11 and M1129:4); 19 and 23. Flat beads (M1138:6 and M1129:3); 24–26. Quasi-trapezoidal ornaments (M1103:30, M708:14 and M557:1); 27. Bar-shaped ornament (M1051:6); 28–30. Irregular-shaped ornaments (M270:1, M708:13 and M697:5); 31. Tubular bead (M16:3); 32. Rectangular ornament (M7:11); 33–35, 48 and 49. Tubular ornaments (M898:45, M779:12, M809:1, M1303:5 and M1144:48); 36–40. Quasi-rectangular ornaments (M648:3, M1200:35, M888:13, M389:23 and M506:26); 41–44. Irregular-shaped ornaments (M779:16, M765:3, M389:22 and M1406:8); 45–47. Triangular ornaments (M389:21, M34:2 and M779:14); 50. Button-shaped ornament (M1086:13); 51 and 52. Bird head-shaped ornaments (M1360:15 and M651:4); 53. Quasi-triangular ornament (M1060:41); 54. Turquoise-inlaid vessel stand (M2:7); 55. Turquoise object (T304M1:3); 56. Necklace strung with cowries and turquoise beads (M13:9); 57. Quasi-triangular ornament (M17:3); 58. Quasi-rectangular ornament (M13:10); 59. Tubular bead (95TZM216:1); 60. Quasi-rectangular ornament (95TZM130:5).

(1–16. From remains of Banshan Type of Majiayao Culture at Liuwan Site in Ledu, Qinghai; 17–30. From remains of Qijia Culture at Liuwan Site in Ledu, Qinghai; 31 and 32. From Bianjialin Site at Kangle, Gansu; 33–53. From remains of Machang Type of Majiayao Culture at Liuwan Site in Ledu, Qinghai; 54. From Dianhe Site in Guyuan, Ningxia; 55. From Shizhao Site in Tianshui, Gansu; 56 and 58. From Xiahaishi Site in Lanzhou, Gansu; 57. From Dragkhung Nakha Site in Jainca, Qinghai; 59 and 60. From Zongri Site in Tongde, Qinghai)

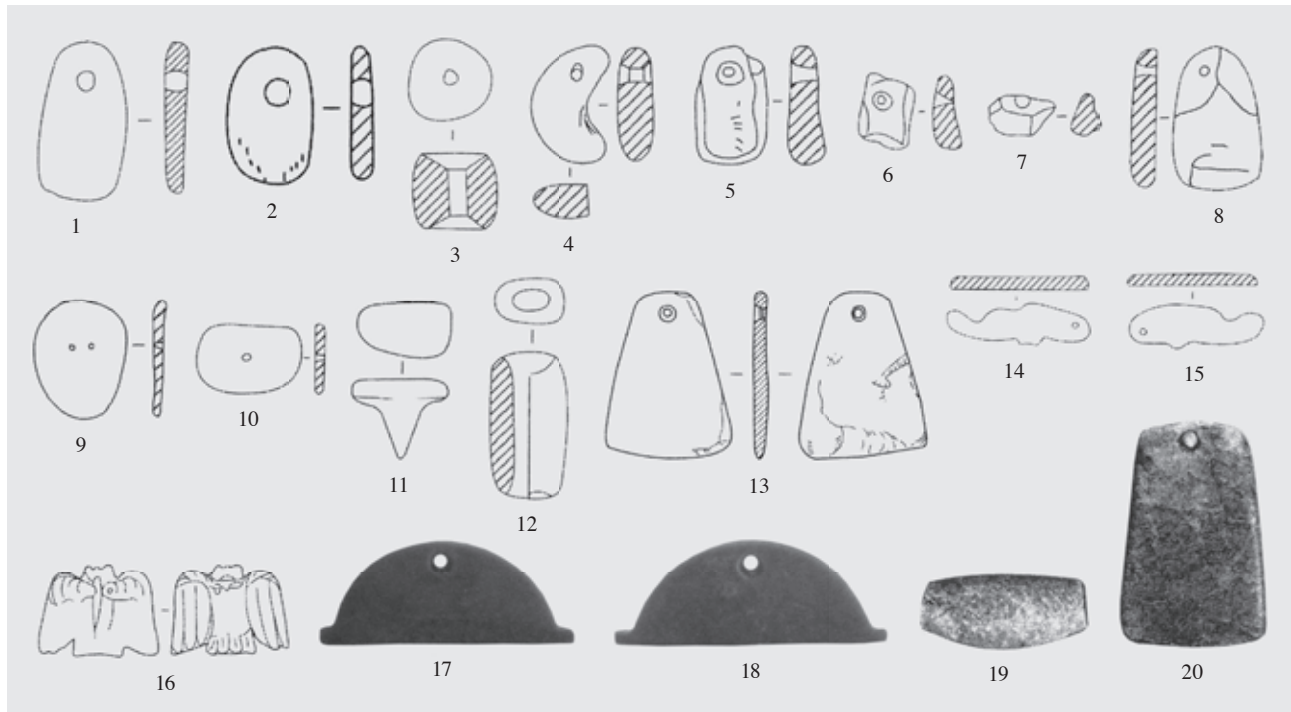


Figure 4 The turquoise objects unearthed in the Northern Frontier Zone.

1 and 2. Quasi-rectangular pendants (IIT8 ⑤ :27 and IIT8 ⑤ :28); 3. Bead (Gathered from lower strata:176); 4. Irregular-shaped pendant (Gathered from lower strata:42); 5–7. Irregular-shaped pendants (G12 ② :52, T3 ③ :45 and T3 ③ :48); 8. Pendant (Gathered); 9 and 10. Perforated pieces (J:26 and J:27); 11. Nail-shaped ornament (J:28); 12. Bead (M14:3); 13. Ax-shaped ornament (91NIIZ1M23:1); 14 and 15. Fish-shaped pendants (M3:5 and M3:3); 16. Owl-shaped ornament (TC6 ② :1); 17 and 18. Semicircular pendants (02NXVIM4:7 and 02NXVIM4:8); 19. Tube (CM19:5); 20. Trapezoidal pendant (AM152:1).

(1–4. From Guojiacun Site in Dalian, Liaoning; 5–7. From Beigou Site in Xiuyan, Liaoning; 8. From Xubu Site in Dandong, Liaoning; 9–11. From Beifudi Site in Yixian, Hebei; 12. From Danangou Site in Chifeng, Inner Mongolia; 13, 17 and 18. From Niuheliang Site in Jianping, Liaoning; 14 and 15. From Hutougou Site in Fuxin, Liaoning; 16. From Dongshanzui Site in Harqin Left County, Liaoning; 19 and 20. From Nan Baoligaotu Cemetery in Jarud Banner, Inner Mongolia)

Weiganping and Xisiping in Changyang and Lijiawan in Badong, all three in Hubei.

Two turquoises belonging to the Shijiahe Culture of the terminal Neolithic Age were recovered from the Zaolingang Site in Jingzhou, Hubei (Figure 5).

6. The lower reach of the Yangtze River. To the west part of this region, two turquoises were recovered at the Lingjiatan Site dating to 4000–2200 BCE. There are also a few from some sites of Liangzhu Culture (Figure 6).

7. The South China. Very few turquoises were recovered in this region. At present only a few is known at the Shixia Site of Shixia Culture in Shaoguan, Guangdong that are dated to the terminal Neolithic Age.

Classification. In this study we classify the unearthed turquoises based on two criteria. First, by the object forms, the Neolithic turquoises were categorized into seven types.

Type 1 is represented by globular objects, while Type 2 is of oval or similar forms. Type 3 is of straight lined

geometric shape. Type 4 is characterized by tubular objects with various shapes of cross-sections. Type 5 is in shapes of animals. Type 6 is of tool-type. Type 7 is all others that do not fall into any of the above.

Second, these turquoises are categorized in terms of functionality that falls into two groups. Group 1 were used as personal adornments such as necklaces, brooches, and bracelets, while Group 2 were used for decorating objects such as bone wares, ivory wares, lacquer wares and jades. Sometimes, turquoises were also used for decorating pottery wares.

Typological characteristics and changes of turquoise objects

The use of turquoises appeared first at the sites of Peiligang and Dadiwan Cultures and the remains of Phase I of Beifudi Site. Those pieces are small in size, in ranges of 1–3cm, except a few around 4–5cm. They are

primarily oblate in shape, most with perforations and roughly polished, but in general they were made coarsely without further processing.

During the late Neolithic Age, different forms of turquoises appeared in different regions. Turquoises appeared in abundance and great variety during the Early-Middle Yangshao period in the central China. Some are large-sized *huang*-shaped pendant (Figure 1:29), and other are in the shape of *jue*-earring such as those from the Hejiawan Site in Shaanxi (M12:10, see Figure 1:37). Overall they display primarily in flat and plain, but new types appeared in prismatic or in fish-shaped forms. During this period, some turquoises were grooved around the body, in addition to perforation, function of which were possibly for suspending according to the placement and sizes of the objects being pendants. Other features include elaborated polishing, but lack of engraving design or used as inlay.

The turquoises appeared in the Haidai region a bit later till the late Neolithic Age, in small size ranging of 1–3cm with a few exceptions in 5cm. Most of them are in the shape of circular disc with perforations. They have two differences from those of the Central Plains. First, the turquoises were used for inlays as early as in the middle phase of Dawenkou Culture. Second, engraved decoration appeared on some of them, such as that on a fish-shaped ornament found at Yedian Site (M54:1). Although these engraved lines are simple straight and curved ones, the configuration of these lines depicts the fish's mouth and gill in an abstract style (Figure 2:21).

However, turquoise objects unearthed in the upper reach of the Yellow River have different form and function. Most of them are in simple forms of beads made by grinding, represented by the 146 beads found in Zongri Site in Tongde County, Qinghai, possibly strung with bone beads together.

Turquoises in the Northern Frontier Zone are also in small size ranging of 1–3cm, all with bilaterally drilled perforations. Those turquoises were assumed to be used as pendants, in different forms such as tubular beads and fish-shaped or owl-shaped pendants, mostly fully polished. The fish-shaped pendants from the Hutougou

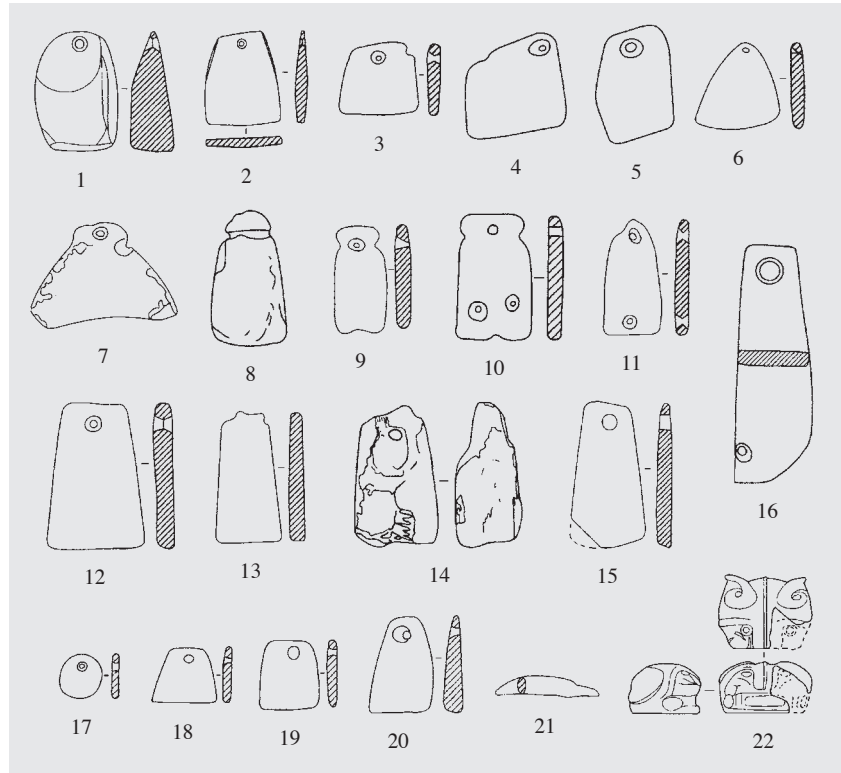


Figure 5 The turquoise objects unearthed in the middle reach of the Yangtze River.

1. Quasi-rectangular pendant (M6:1); 2. Trapezoidal pendant (T202 ② :14); 3 and 4. Quasi-square pendants (T7 ② C:18 and T7 ② C:20); 5. Quasi-rectangular pendant (T15 ③ :3); 6. Triangular ornament (T2 ③ :5); 7. Quasi-triangular ornament (CT7 ② C:19); 8–11. Quasi-trapezoidal ornaments (T54 ③ :5, T18 ③ :7, T29 ③ :9 and T29 ③ :16); 12 and 13. Trapezoidal ornaments (T12 ③ :9 and T43 ③ :8); 14. Irregular-shaped ornament (T43 ③ :9); 15. Ax-shaped ornament (T57 ③ :2); 16. Knife-shaped ornament (T1 ③ :29); 17. Circular pendant (M191:1); 18. Trapezoidal pendant (M205:5); 19. Square pendant (M101:2); 20. Trapezoidal pendant (M138:1); 21. Knife (Lower strata, unit unknown); 22. Tiger-shaped ornament (JZWM1:1).

(1 and 2. From Lijiawan Site in Badong, Hubei; 3–7. From Weiganping Site in Changyang, Hubei; 8–16. From Xisiping Site in Changyang, Hubei; 17–20. From Daxi Site in Wushan, Chongqing; 21. From Zhuweicheng Site in Qingjiang, Jiangxi; 22. From Zaolingang Site in Jingzhou, Hubei)

Site (Figures 4:14 and 4:15) and the owl-shaped pendant from the Dongshanzui Site (Figure 4:16) are the representative samples of advanced turquoise technology in the Northern Frontier Zone of China.

Turquoises of this period from the Yangtze Valley are also in small size ranging of 1–3cm, similar perforated, and used possibly as pendants too. Generally, the pieces were fully polished but made of simple techniques.

It is worth noting that turquoises identified in the Northern Frontier Zone, such as those from Dongshanzui, Hutougou, and Niuheliang Sites, display raw materials of green turquoise on one side and black cortex on the other.

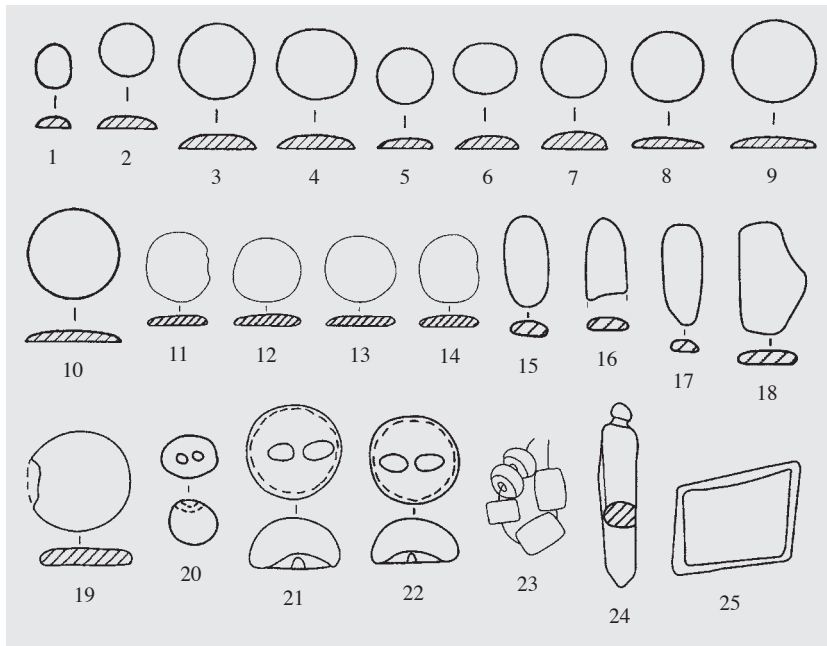


Figure 6 The turquoise objects unearthed in the lower reach of the Yangtze River.

1–10. Pieces (M5:2-2); 11–19. Inlaying pieces (M21:16 and M21:19); 20. Globular bead with curved hole (M21:17); 21 and 22. Beads (M11:19 and M11:22); 23. Beads (The two circular ones in the string, from M114); 24. Drill-shaped ornament (IIM204:6); 25. Piece (87M1:15).

(1–10. From Qiuchengdun Site in Wuxi, Jiangsu; 11–20. From Fanshan Site in Yuhang, Zhejiang; 21 and 22. From Yaoshan Site in Yuhang, Zhejiang; 23. From Xindili Site in Tongxiang, Zhejiang; 24. From Maqiao Site in Shanghai; 25. From Lingjiatan Site in Hanshan, Anhui)

It was told that similar raw materials were also found on those from the Longgangsi Site in Xixiang, Shaanxi Province. Some also reported that turquoises with cortex are also found at the upper reach of Yellow River such as the Zongri Site in Tongde and Zhigang Laka (Dragkhung Nakha) Site in Jainca, both in Qinghai, as well as at the Wangyin Site of Dawenkou Culture in its lower reach. Currently it is unclear if these turquoises from different regions were produced from the same raw materials. If so, then it is vital significant to the understandings of the resources and trades of the turquoises produced in the different regions during this period even the communications of the prehistoric cultures.

At the terminal period of the Neolithic Age, turquoises were still as small as those in the earlier times, although some can fall around 4–5cm, but most perforated. Two features are noted in this period. First, the turquoises are frequently used as pieces for inlays, and second, more tubular beads made of turquoise were found.

Temporal and spatial distributions of turquoise objects

Turquoises first appeared in the sites of Peiligang and the Dadiwan Cultures in the Central Plains, and in large

quantity. However, except four pieces that are identified at the Beifudi Site so far, there has been none appearing in any of other regions during this period. Therefore, the Central Plains had its own path of origins.

There were great increase in quantity of turquoises and localities yielding turquoise artifacts during the late Neolithic Age, when turquoises were produced and used in all cultural regions except for the South China. The most abundant turquoises appeared in the upper reach of the Yellow River counting for 237 pieces, followed by 133 pieces found in the Central Plains and 67 pieces in the Haidai cultural zone, respectively. There are a few found in the Yangtze River Valley numbering in 27 found from the middle reach of Yangtze River. While there are only 25 pieces identified in Northern Frontier Zone, only three pieces are dated to the late Neolithic Age in the lower reach of the Yangtze River. In total, there are 490 pieces of this period found in total to date, outnumbered any of previous periods in Neolithic Age (Table 1).

During the terminal Neolithic Age, turquoises continued to be produced in these regions, but further spread out in spatial distributions. Especially

there are turquoises in the remains of Shixia Culture in South China. Most frequent discovery of turquoises is still the upper reach of the Yellow River counting for 356 pieces, much increased in number and in variety from the previous periods. At the same time, there is also an increase in number in the lower reach of the Yangtze River. In other regions, there are about 8–16 pieces found in average during this period. In general the total number of turquoises in this period is fewer than those in the late Neolithic Age, counting a total of 457 pieces. However, the production of turquoise is no less than the previous period because most of objects in the terminal Neolithic Age were made as of inlays, pieces of which were not counted for, but numbers of the objects decorated by these pieces. However, it must be noted that the number of sites where turquoises were found in this period is actually fewer than that in previous period in some regions especially the Central Plains, the Haidai cultural zone and the middle reach of the Yangtze River.

Based on the frequencies of turquoises and their characteristics in general, it is suggested that production and use of turquoises in Neolithic Age was very common at the upper reach of the Yellow River, the Central Plains, and the Haidai cultural zone. In particular, the use of turquoises in the Central Plains was not more dramatic

Table 1 Frequencies of Neolithic turquoises by regions.

Number Periods	Regions								Total
	Upper reach of the Yellow River	Northern Frontier Zone	Central Plains	Haidai cultural zone	Upper and middle reaches of the Yangtze River	Lower reach of the Yangtze River	South China		
Middle Neolithic Age	0	4	89	0	0	0	0	0	93
Late Neolithic Age	235	25	133	67	27	3			490
Terminal Neolithic Age	356	12	15	15	3	40	16		457
Total	591	41	237	82	30	43	16		1040

than any of other regions, suggesting a gradual increase in the early and middle Neolithic Age but sudden decrease in the late Neolithic Age. There were more frequencies in the remains of Majiayao Culture in the upper reach of the Yellow River, but only concentrated in two sites only. This was changed during the late phase of Majiayao Culture; the number of sites yielding turquoises has dramatically increased into more than a dozen in the region, which are mainly distributed on the bank terraces of the sections of the Yellow River and its tributaries such as Tao and Huang Rivers. In the Haidai cultural zone, turquoises appeared as early as in the early phase of Dawenkou Culture but in low frequency, while the number of turquoises increased during the late phase of Dawenkou Culture. At present more than a dozen of sites of Dawenkou Culture in northern Jiangsu Province as well as the valleys of the Wen and Si Rivers in Shandong Province yielded turquoise objects. However, during the Longshan Age, number of such sites decreased, only two sites, Xizhufeng in Linqu and Sanlihe in Jiaoxian yielded turquoises.

Archaeological contexts

The present data (Table 2) suggests that most turquoises were unearthed from burials, but a few from occupational units including ash pits. 76.34% of those dated to middle Neolithic Age were unearthed from burials. Down to the late Neolithic Age, in the regions of Central Plains, Haidai region, and the lower reach of Yangtze River, over 80% of turquoises were unearthed from burials. However, about half a total of turquoises were recovered in occupational units while one third of that from burials in the Northern Frontier Zone and the middle reach of the Yangtze River. At the terminal period of the Neolithic Age, almost all turquoises were discovered from cemeteries. This data suggest that the primary function of turquoises were used as personal adornment which went with the deceased in the afterlife.

As for the types of archaeological remains yielding turquoises, it is suggested that in the Central Plains they were discovered from almost all types of remains, namely

Table 2 Frequencies of unearthed turquoises by archaeological units.

Periods and regions	Late Neolithic Age								Terminal Neolithic Age					
	Middle Neolithic Age	Upper reach of the Yellow River	Northern Frontier Zone	Central Plains	Haidai cultural zone	Middle reaches of the Yangtze River	Lower reach of the Yangtze River	Upper reach of the Yellow River	Upper Frontier Zone	Central Plains	Haidai cultural zone	Upper and middle reaches of the Yangtze River	Lower reach of the Yangtze River	South China
Burials	71	12	7	109	63	11	3	356	11	9	15	3	40	16
Percent- age	76.34%	5.11%	28%	81.95%	94.03%	40.74%	100%	100%	91.67%	60%	100%	100%	100%	100%
Ash pits, Strata, etc.	22		11	21	3	15	0	0	1	5	0	0	0	0
Percent- age	23.66%	?	44%	15.79%	4.48%	55.56%	0	0	8.33%	33.33%	0	0	0	0
N/A	0	223	7	3	1	1	0	0	0	1	0	0	0	0
Percent- age	0	94.89%	28%	2.26%	1.49%	3.70%	0	0	6.67%	0	0	0	0	0

burials, ash pits, cultural deposits, etc. Whereas turquoises were seen in ash pits in the Haidai region, the middle reach of the Yangtze River and the Northern Frontier Zone, turquoises in both the upper reach of the Yellow River and the lower reach of the Yangtze River were from burials only. It is reasonable to suggest that those found in the ash pits were possibly abandoned intentionally; those found in cultural deposits were likely lost unintentionally; and those found burials must have been placed on purpose. Therefore, it is concluded that Neolithic people lived in the lower reach of the Yangtze River and the upper reach of the Yellow River treasured turquoise ornaments highly, keeping them away from being lost and abandoned.

In addition, based on some reports which indicate the placement of turquoises in the burials, they were mostly found nearby necks, jaws, and chest of the burial occupants, with a few cases of nearby waists and hands.

Individuals of male, female, adult and youth, are all associated with turquoise ornaments; however there were possible preferences in different regions. For instance, burial data from the Jiahu Site in the Central Plains suggests that mostly male individuals were associated with turquoise ornaments, therefore inferring that men rather than women preferred to use of turquoises in this region. Late in the Yangshao Age, women from the Longgangsi Site were found more in favor of wearing turquoise pendants than men.

The Huating Cemetery in the Haidai region yielded

relatively high numbers of turquoises, most of which were associated with juvenile individuals, followed by female bearers. The data (Table 3) further suggests the use of turquoise pendent were preferred by the youth under 25 years old, followed by the females.

During the middle Neolithic Age, or Yangshao Age, the overall structure and content of burials of those with and without turquoises barely have differences. Therefore there is no indications of ritual symbolism for the use of turquoises, instead possibly of personal preferences.

Changes in use of turquoises occurred during the time of Dawenkou Culture in the Haidai region. Data from the burials of Huating Cemetery suggest possibly that use of turquoises might become exclusive to few, thus an indicator of personal status. This became more obvious in the following Longshan Age. The fact that over a thousand of turquoises were found only in the tombs M202 and M203 of the Xizhufeng Cemetery in Linqu, while none at all from any other burials of the same cemetery, suggests the use of turquoises is highly exclusive to a few personals with high status in the societies.

However, in the Central Plains, it is noticeable that a great decrease in use of turquoises occurred at the terminal Neolithic Age. The reason for such a decrease needs further investigations.

Resources and related issues

At present, turquoise ores are mainly distributed in the

Table 3 Unearthed turquoises from burials by sex and age in the Haidai cultural zone.

Sex	Male					Female					N/A			Notes			
	Age	Juvenile	Youth	Middle-aged	Old-aged	Adult	Juvenile	Youth	Middle-aged	Old-aged	Adult	Juvenile	Youth		Middle-aged	Old-aged	Adult
Wang-yin	13	2	1	1		2		4	2			1					One around 6 yrs old
Dawenkou	4								1	1							2
Yedian	5			1				1			1	1					One sex and age unknown
Dayi-shan	1											1					One infant female
Huating	7	3	1								1						One female unknown age
Total	22	2	1	1	1	0	1	5	0	2	1	3	0	0	0	0	

Notes: 1. Multiple occupants of the same sex in one joint burial is counted as 1.

2. Juvenile: <20 years old; youth: 20–35 years old; middle-aged: 36–50 years old; old-aged: >51 years old; adult: age unavailable but >20 years old.

United States, Iran, China, Russia and Egypt. In China, gem-class turquoises are primarily distributed in the east side of the Qinling Mountains, especially the border area between Shaanxi and Hubei Provinces, where turquoises were mined as early as in the Yuan Dynasty.

According to present studies on the origins of turquoise raw materials in reference to the discussion of sourcing study of jade materials, this author is in favor of local procurements of Neolithic turquoises.

As we assume that Neolithic turquoises were from a few known mining locations, then turquoises in these areas might have been quarried from the nearby mining locations. However, in order to prove this hypothesis, there are more works need to be done. Scientific testing is an important approach to study of turquoise sources. As for how to sampling, the author suggests that samples of modern mines and samples of archaeological materials be obtained together for testing. We need to establish the database of sampling test within a region, and then the database of modern samples fetched from sources of different regions. The tests must be done on the well-dated archaeological sites and units to establish benchmarks. For example, we all know that the Erlitou Site is one of the most important sites where exquisite turquoises were found along side with by-products and raw materials; thus samples from the Erlitou Site must be essential and could be used for benchmarks. Other sites dated from prehistoric to Qin-Han Dynastic periods also well preserve samples of turquoises that could serve good samples for testing. In conclusion, abundant quantity of

unearthed turquoises from different periods have provided a good ground for future sourcing studies on the case-by-case basis.

References

- Guo, Dashun 郭大顺 . 2000. 从红山文化的绿松石饰件想到的 (Thinking from the turquoise ornaments of Hongshan Culture). *Gudai wenming yanjiu tongxun* 古代文明研究通讯 (Ancient civilizations review) 7: 30–1.
- Tu, Huaikui 涂怀奎 . 1996. 陕鄂相邻地区绿松石矿地质特征 (Geological characteristics of turquoise ore in the areas adjacent to Shaanxi and Hubei Provinces). *Shaanxi dizhi* 陕西地质 (Geology of Shaanxi) 14(2):59–64.
- Zhong, Huabang 钟华邦 . 2006. 中国的松石资源 (Turquoise resources of China). *Jiangsu dizhi* 江苏地质 (Jiangsu Geology) 30(2):134.
- Institute of Archaeology, Chinese Academy of Social Sciences 中国社会科学院考古研究所 [eds]. 2010. *Zhongguo kaoguxue: xinshiqi shidai juan* 中国考古学: 新石器时代卷 (Chinese archaeology: volume for Neolithic Age). Beijing: Zhongguo shehuikexue chubanshe.

Postscript

The original paper published in *Kaogu xuebao* 考古学报 (*Acta Archaeologica Sinica*) 2014.2:139–68 with six illustrations and seven tables was authored by Xiaoxia Pang 庞小霞 . This abridged version is prepared by the author and translated into English by Chen Shen 沈辰 .