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# Prospecting and Excavation of the Palace Complex and the Outside Roads of the Erlitou Site in Yanshi, Henan

The Erlitou Fieldwork Team, Institute of Archaeology, Chinese Academy of Social Sciences

**Keywords:** Erlitou site    palace complex    road network    wheel imprint

In the recent years, we concentrated on the plan of the palace complex of the Erlitou 二里头 site. Since 2001, we undertook systematic prospecting work on the road network within and without the palace complex and came to find a few crisscrossing roads. In the spring season of 2003, we investigated the cross section of the discovered roads, and exposed the enclosing walls of the palace complex. Till April of 2004, we have successfully disclosed the dimension, structure and chronology of the enclosing wall and the outside roads.

## I. Fieldwork

In 1976, the Erlitou Fieldwork Team discovered a north-south road outside Palace Foundation No.2 and exposed it for 200 m. In the autumn season of 2001, following this road, we undertook an extensive coring work in blocks III, V, VI of the site, where the palace complex is located, and came to discover three crisscrossing roads outside the complex.

The coring work indicates that immediately to the east of Palace Foundation No.2, which sits in the eastern part of the palace complex, runs a north-south road, with neither wall nor moat in the intermediate space. This suggests to us that the eastern wall of Palace Foundation No.2 equally represent the eastern wall of the palace complex if it had an enclosing wall. In the autumn season of 2003, we traced the known eastern wall northward and southward, to find that the wall indeed extends to both directions, which confirms our supposition that Palace Foundation No.2 was built upon the eastern wall of the palace complex.

In the same season and the spring season of 2004, we confirmed the roads outside the northeastern corner and the other sides of the palace complex. To the south we

found another rammed wall.

Altogether in these fieldwork seasons we opened more than 50 excavation squares (trenches), and 2700 sq m (Fig. 1).

## II. Outside Roads

1. The road on the eastern side of the palace complex preserves almost 700 m, interrupted by cultural remains of later periods to the north, and by modern village buildings to the south. The roads to the north and south of the palace complex meet the former road at a right angle. The prospected length of both roads exceeds 300 m; their eastern and western ends evade our investigation due to the disturbance of modern earth-quarrying pits, cemetery and village buildings. Most recently, we encountered another north-south road to the west, which preserves a length of 200 m, terminating with a modern earth-quarrying pit to the north. Its southern extension is yet to be investigated in the future.

The four roads parallel the four enclosing walls of Palace Foundations Nos.1 and 2, and demarcate a space corresponding to the known concentration area of massive rammed-earth foundations, which measures over 100,000 sq m.

2. The north-south road kept in use from the early phase through the late phase of the Erlitou culture. In the early phase, it measures about 20 m wide and 0.30–0.42 m thick. Upon this road was constructed the eastern wall of the palace complex, and outside this wall was formed the road of the late phase, synchronic to the lifetime of the palace complex. The road narrows down to 10 m wide. In general it measures 0.25–0.45 m thick, but the section 6–7 m near the wall received the most intensive tramping. The treading layers of roads of both phases are 0.02–0.06 m thick,

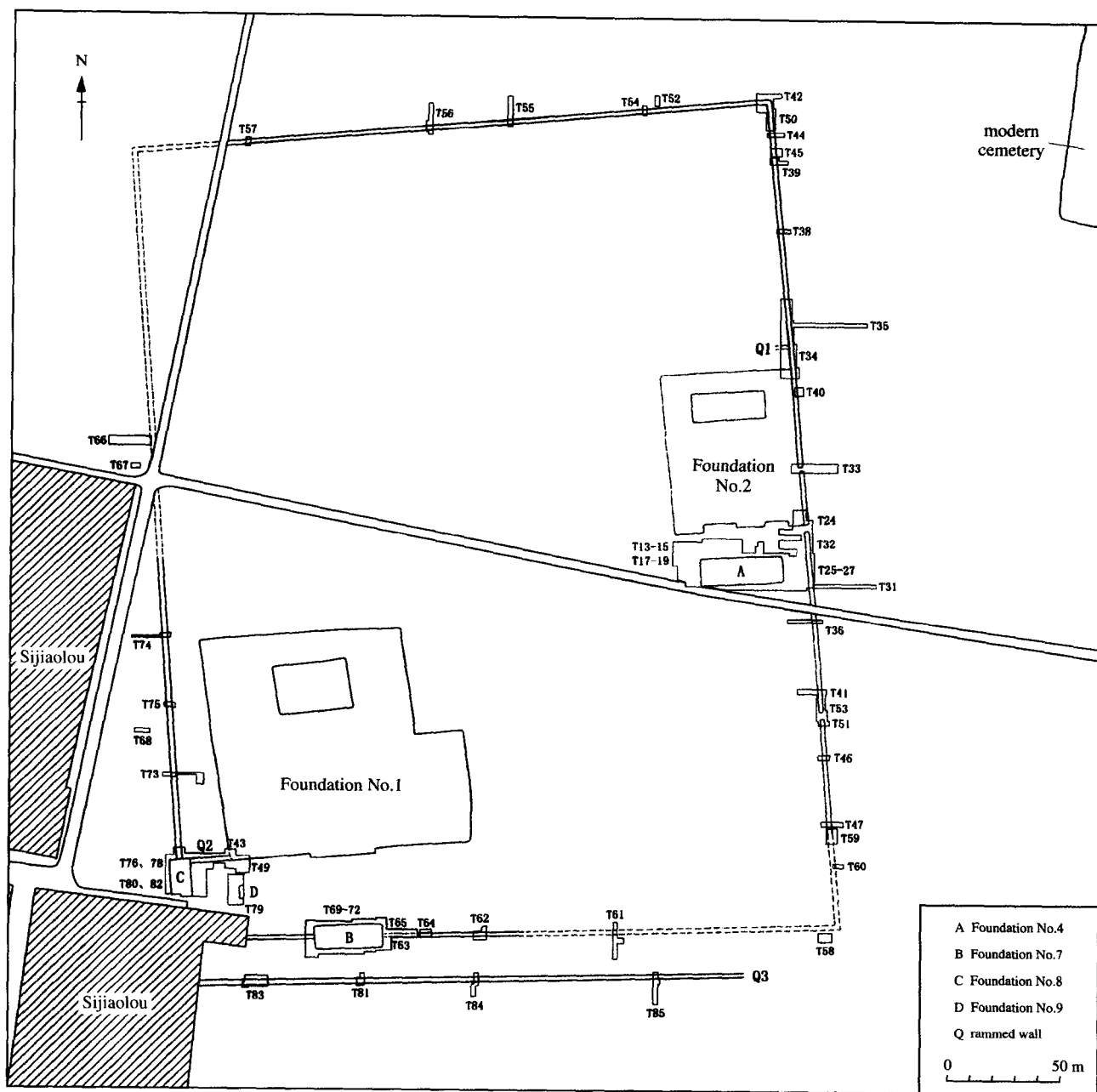


Fig. 1 Illustration of palace walls and related remains

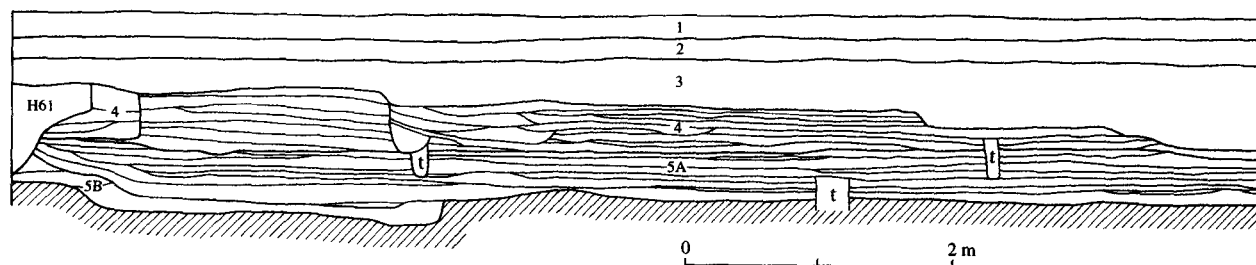


Fig. 2 The cross-section of the west part of northern wall of 03VT31

1. cultivated soil 2. reddish-brown soil 3. heavy reddish-brown soil 4. treading layer of road 5A, 5B. treading layers of road sandwiched with yellowish- and reddish-brown soil t. soft soil

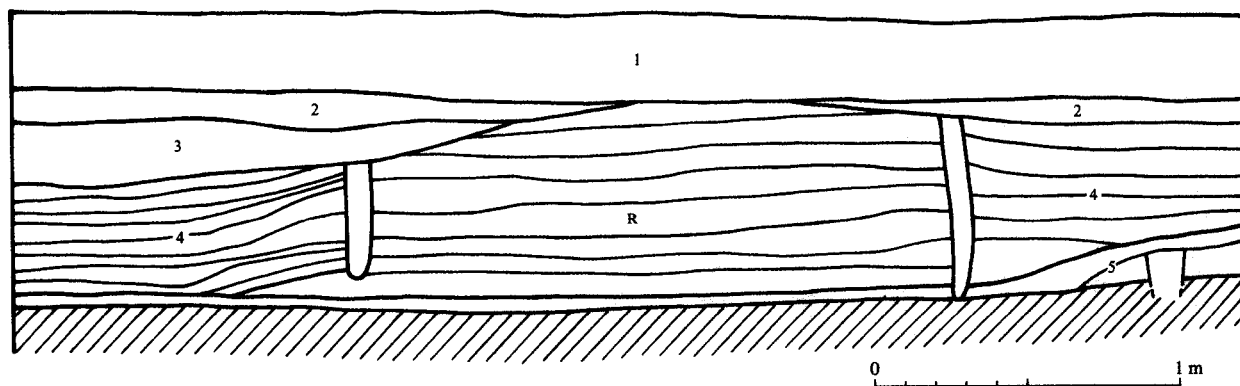


Fig. 3 The cross-section of the eastern wall of 03VT57

1. cultivated soil 2. Han period layer 3. layer of the late Erligang culture 4. layer of the late Erlitou culture (road) 5. layer of the early Erlitou culture (road and paving earth) R. rammed northern wal of the palace

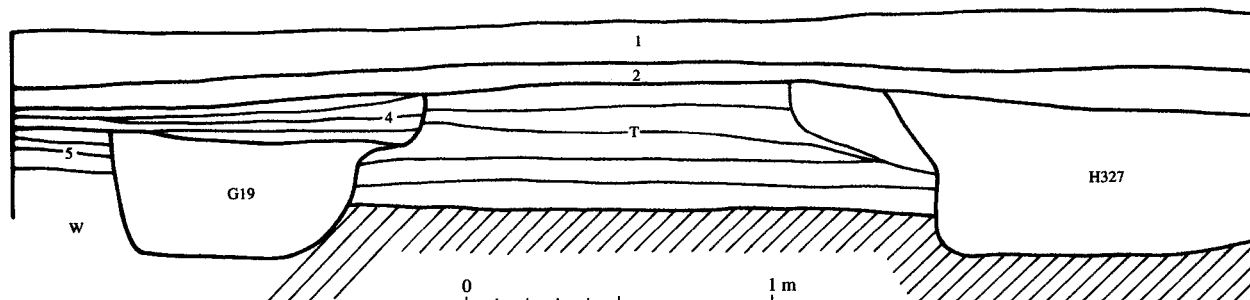


Fig. 4 The cross-section of the part of western wall of 04VT72

1. cultivated soil 2. Han period 4. layer of the late Erlitou culture (road) 5. layer of the early Erlitou culture (road and paving earth) T. rammed southern wall of the palace W. unexcavated

but sometimes up to 0.10 m thick. The layer surfaces were treaded hard and condense, and roughly plain (Fig. 2).

The southern and northern roads are both 10 m wide. The northern road preserves a thickness from 0.13 to 0.42 m. The early road beneath the northern wall measures 0.04–0.24 m (Fig. 3). The early road beneath the southern wall is 20 m wide; its thickness varies from 0.24 to 0.41 m (Fig. 4). The late western road has been thoroughly destroyed. The early road is more than 12 m wide, and 0–0.32 m thick (Fig. 5).

3. The uncovered artifacts from excavation trenches of the walls of the palace complex date the early road underneath the enclosing walls to the second phase of the Erlitou culture, and the late road, or the lifetime of the palace complex, to the third through the end of the fourth phase of this culture (Fig. 6).

### III. Enclosing Walls of the Palace Complex and Synchronic Palace Foundations

1. The palace complex assumes a roughly longitudinal

rectangle in plan; the enclosing walls were erected immediately inside the four roads described above. The eastern wall orients 174 degrees (by the direction of the main gate of the palace foundations); the western wall 174.5 degrees. The southern meets the projected length of the eastern wall at 87 degrees. The reconstructed lengths of the four walls, in the east-west-south-north order, are 378, 359, 295, and 292 m respectively.

The distance from the western and southern walls to the corresponding borders of the Palace Foundation No. 1 is 16–22 m (the western wall of this foundation orients 172 degrees) and 36–42 m. The distance from the northern wall to corresponding border of Palace Foundation No.2 is about 120 m.

The four walls preserve rather poorly. Only the north-eastern corner is preserved; the other three have been destroyed or overlaid by modern village buildings. All the walls are divided into three sections (see Fig. 1). The eastern wall and northern wall are in good condition. Within the extant 330 m length of the eastern wall are

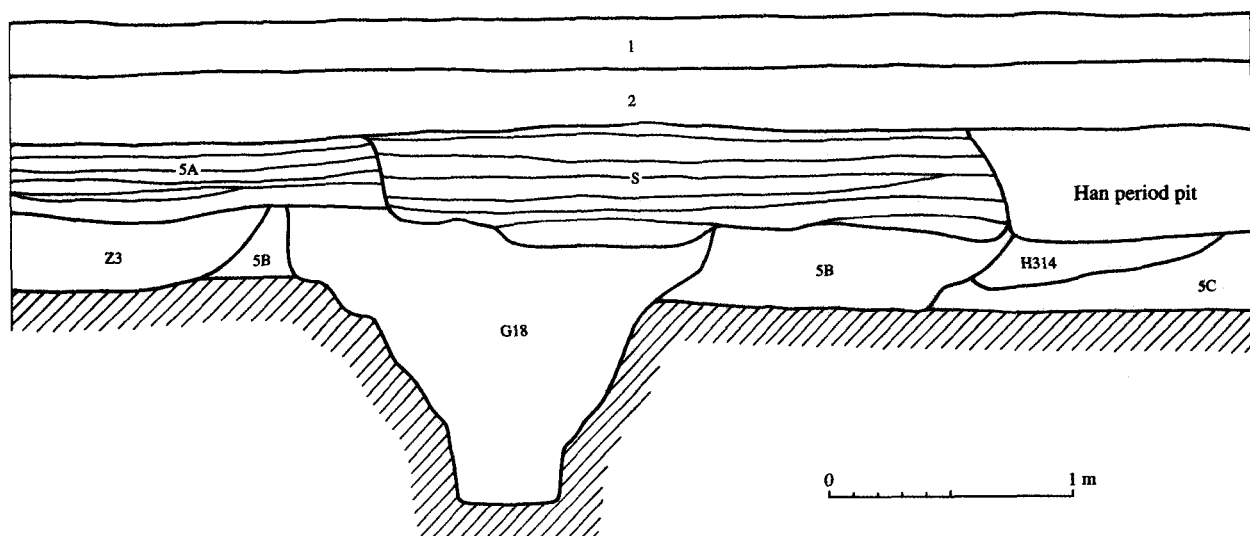


Fig. 5 The cross-section of the east part of northern wall of 04VT74

1. cultivated soil 2. modern layer 5A, 5B, 5C. layers of the early Erlitou culture (5A as road)

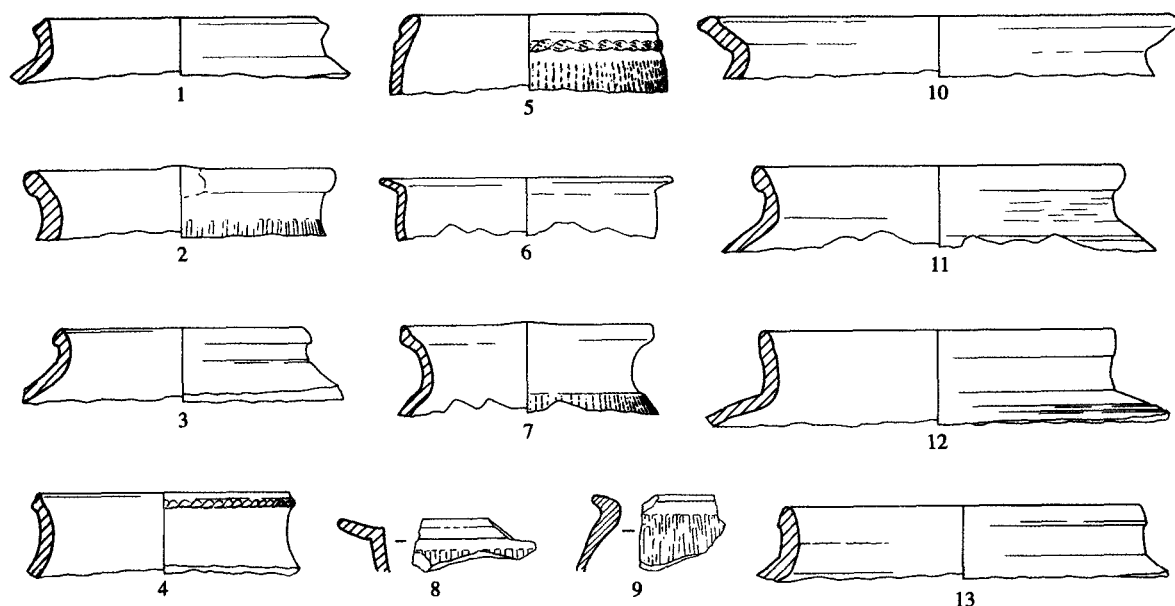


Fig. 6 Ceramics unearthed from the early outside road in the palace complex

1, 3, 11-13. zun-vessels (T62 ⑤ A:4, T33 ⑤:2, T33 ⑤:4, T62 ⑤ A:3, T33 ⑤:3) 2, 7. guan-jarlets (T33 ⑤:5, T62 ⑤ A:6) 4. guan-jarlet (T31 ⑤:2) 5. ding-tripod (T62 ⑤ A:2) 6. basin (T36 ⑤:1) 8. zeng-steamer (T33 ⑤:1) 9, 10. guan-jarlets (T31 ⑤:1, T62 ⑤ A:1) (scales: 5. 1/8; the rest 1/4)

found two doorways. The extant length of the northern, southern, and western walls is 250, 120, and 150 m respectively.

2. Among the four walls the eastern and northern walls are better preserved (Figs. 7 and 8). These walls are all erected immediately upon the ground without underground foundation. They are 1.8-2.3 m wide, but some-

times up to 3 m, 0.1-0.75 m high at present (see Figs. 2 and 3). The eastern wall was built directly upon the early road, the northern wall upon a paving earth with a thin layer of treading (or the early road surface). The eastern and northern walls are constructed of rammed brown earth with little impurity, with uneven ramming layers of 0.04-0.12 m thick (most often 0.08-0.10 m thick). In

certain sections of the two walls are found imprints of planks and posts that constituted the ramming forms. The corner of these walls might have been rammed in a single unit, without any trace of joint or insertion.

The southern and western walls are poorly preserved. They were built upon the early roads, paving earth or virgin earth. In some sections are found underground foundation, and in others trace of repairing and reinforcement (see Fig. 4).

3. Synchronic palace foundations. Corresponding to the southern section of the western wall, and the western section of the southern wall, there are two paralleling palace foundations, which straddle the two axis of the palace complex and join the walls (see Fig. 1). Palace Foundation No.7 sits upon the southern wall, and rightly in front of Palace Foundation No.1 (Fig. 9). The palace foundation sits upon the western wall, and to the south-west of the foundation (Fig. 10).

Both foundations have been severely disturbed. The Foundation No.7, 31.5 m and 10.5–11 m in dimension, only preserves the bottoms of three postholes with resting stones, 4 m apart. Foundation No.8 measures 20 m long in the excavated area and 9.7–10 m wide. It preserves eight

postholes; the better preserved eastern line includes six postholes, 3 m apart. The southern part of this foundation is underneath modern village buildings, and the entire length of the foundation and the complete number of postholes are not known presently. Both were rammed out of clean brown earth to the best quality. The underground foundation pit has a depth up to 2 m. The lower layers of rammed earth of the underground foundation sandwich layers of pebbles, analogy of which can be found in the underground foundation of Palace Foundation No.1.

The western section of the southern wall inserts into Palace Foundation No.7, indicating that the latter is posterior to the former in the construction order. Palace Foundation No.8 has its northern edge extends beyond the foundation pit, unifying with the foundation of the already built western wall. We suppose that they were constructed in one time. The two palace foundations, given their stratigraphical data and spatial position, are synchronic to the enclosing walls of the palace complex.

4. Inventory and date assessment. The excavations uncovered ceramic fragments, most of which date to the second phase of the Erlitou culture, some to the end of this phase. The late road synchronic to the enclosing



Fig. 7 The northeast section of the palace city (photo from south to north)

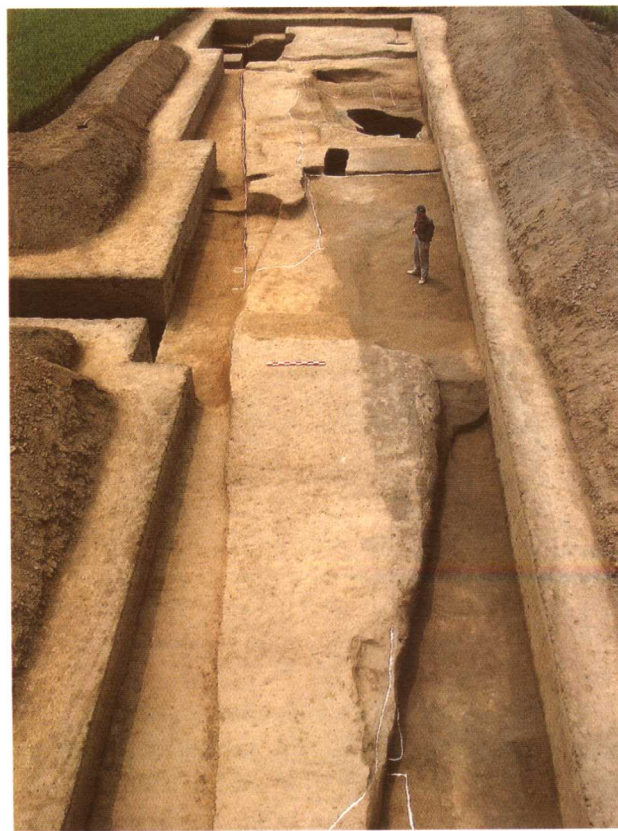


Fig. 8 The eastern wall of the palace city (photo from north to south)

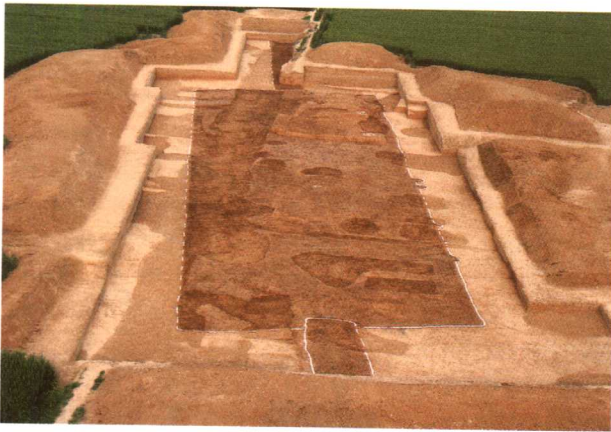


Fig. 9 Foundation No.7 and the south wall of the palace city (photo from west to east)



Fig. 10 Foundation No.8, the western wall and Wall No.2 of the palace city (photo from east to west)

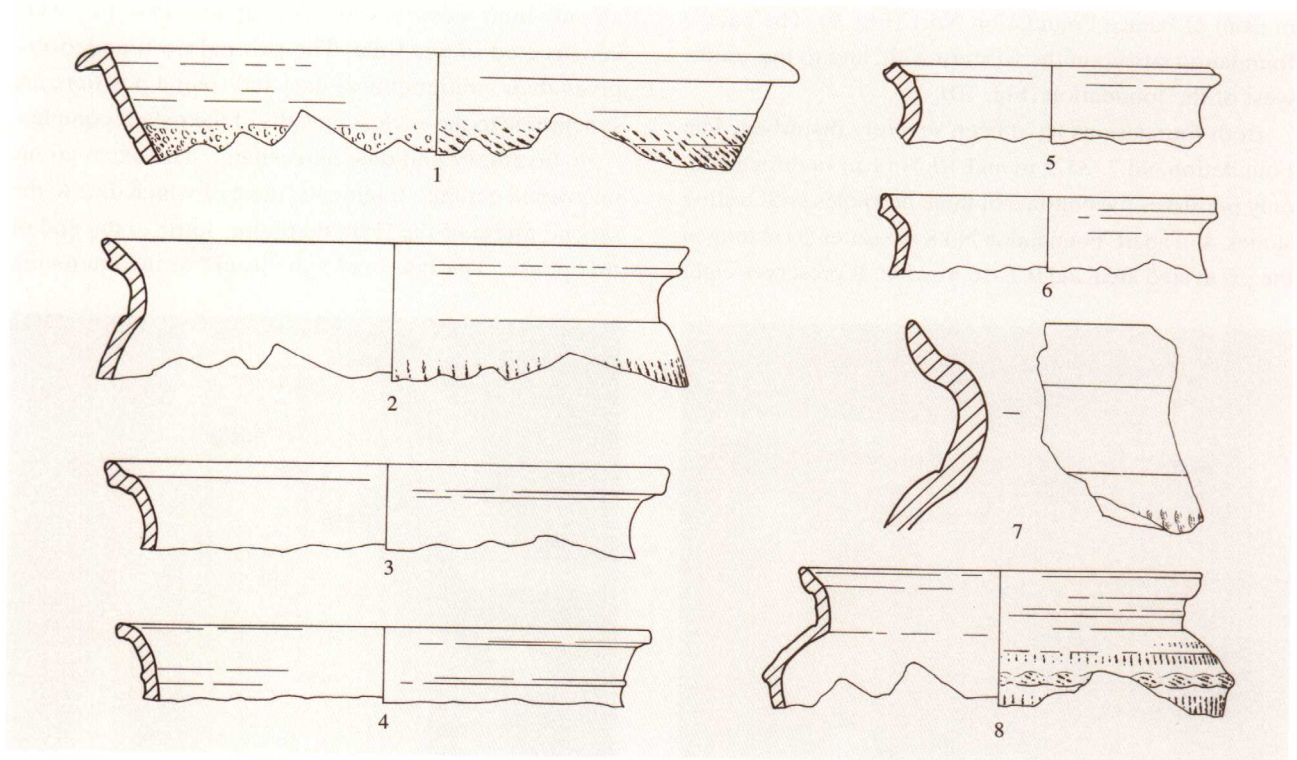


Fig. 11 Ceramics unearthed from the road synchronic to the enclosing walls of the palace complex

1. basin (T35④:12) 2, 3, 5, 6. *guan*-jarlets (T35④:9, T33④:2, T36④:10, T36④:9) 4, 8. vessels (T35④:11, T35④:3) 7. *guan*-jarlet (T33④:1) (scales: 1, 4, 8. 1/5; 7. 1/2; the rest 1/3)

walls of the palace complex contains ceramics of the third through the end of the fourth phase of this culture (Fig. 11).

The eastern end of the northern wall enters the eastern wall at a right angle. Thus the eastern wall does not postdate Palace Foundation No.2 in the date of construction, or not later than the third phase of the Erlitou culture. To the north of Palace Foundation No.2, and attached to the eastern wall is built Wall No.1

(T34Q1), from which the latest ceramics date to the fourth phase of the Erlitou culture (Fig. 12). The finds from the road layers and paving earth resting upon this wall indicate that it was in use in the end of the fourth phase of the Erlitou culture; some finds date it to an even later period, suggesting that the eastern wall remained in use in this period.

Just like the four walls, Palace Foundation Nos.7 and 8 intruded into a few trash-pits of the second phase of the

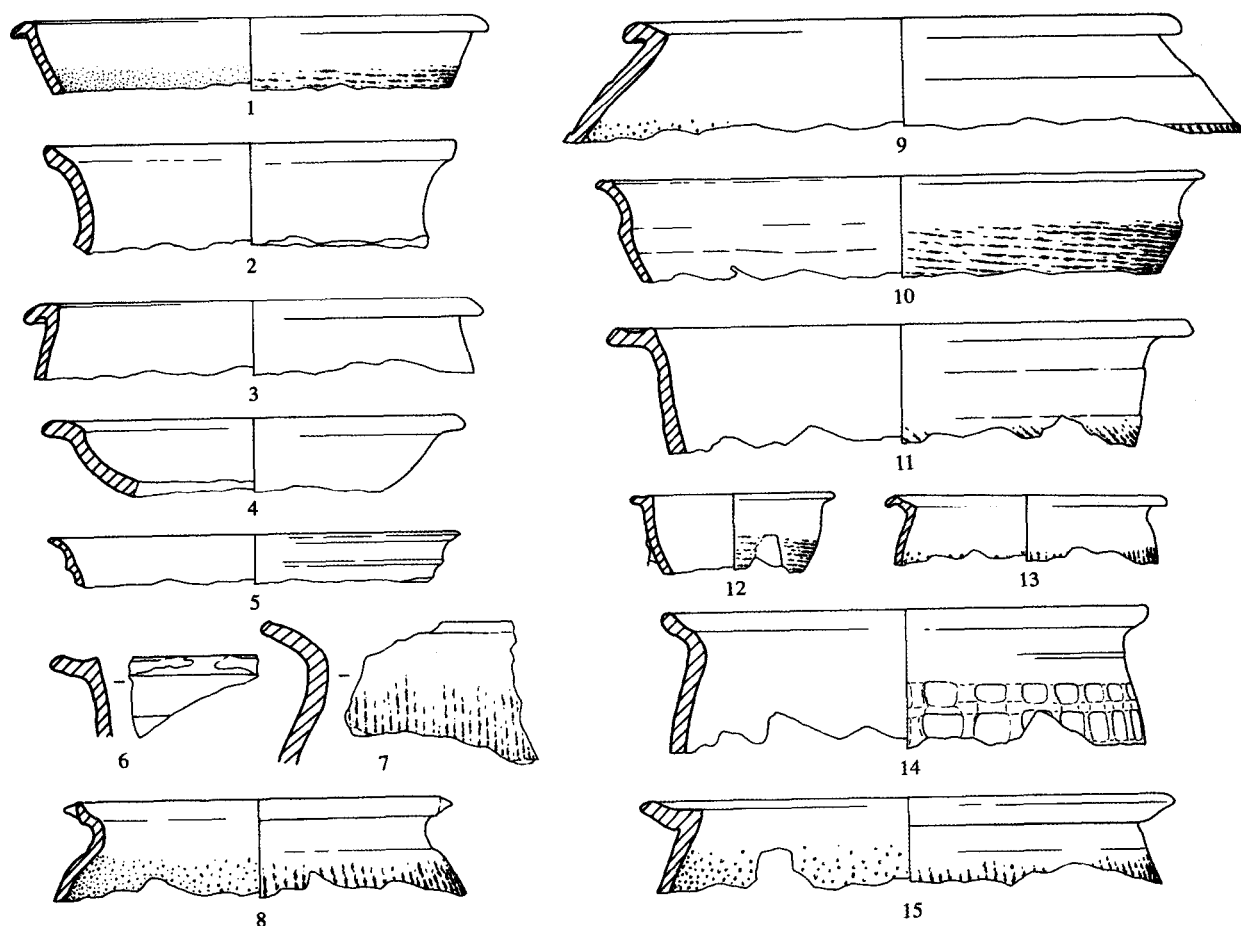


Fig. 12 Ceramics unearthed from rammed-earth Wall No.1 and its deposits

1, 10. basins (T34 ④ L:6, 7) 2, 7, 13–15. *guan*-jarlets (T34 ④ L:1, 2, 10, 3, T34Q1:3) 3, 9. *guan*-jarlets (T34Q1:4, T34 ④ L:11)  
4. *dou*-stemmed plate (T34④L:8) 5. vessel (T34④L:5) 6, 11. *zeng*-steamer (T34Q1:2) (scales: 1, 5, 9, 10, 12, 13. c.3/20; the rest 1/3)

Erlitou culture, and the road layers and paving earth relying on Palace Foundation No.7 date to the end of the fourth phase of this culture. The earliest features and cultural layers directly intruding into or superimposed upon the enclosing walls and palace foundations date to the late phase of the Erligang period of the Shang culture.

Overall, the enclosing walls, Palace Foundation Nos. 7 and 8 were built between the second and third phases, kept in function till the end of the fourth phase of this culture or even later.

#### IV. Other Features

On one surface of the early road to the south of the palace complex are found two paralleling wheel imprints. Within the excavation area the wheel imprints are over 5 m long, but they appear to extend both eastward and westward (Fig. 13). They are in general 0.20–0.32 m wide, and 0.02–0.14 m deep. They bear the form of

depressed groove upon road layers and ashy deposits. The two imprints are 1 m apart. The road surfaces underneath and over the imprints date to the second phase of the Erlitou culture.

18–19 m to the south of the southern road is found an east-west rammed earth wall (Q3), which measures about 2 m, and has a broad and deep underground foundation trench. It surpasses the enclosing walls in quality. Paralleling the southern wall, it orients 88 degrees, and the investigated section extends for 200 m (see Fig. 1). It was constructed in the end of the fourth phase, but abandoned fairly soon after. This wall might have been a part of an enclosed structure.

Underneath this wall is found a trash pit of turquoise (04VT85H290), which yields thousands of pieces of turquoise. Most pieces are tiny in size, and a large number of them carry trace of cutting and grinding. Some are abandoned beads due to improper drilling. The



Fig. 13 The wheel imprints of the second stage of the Erlitou culture

pit dates to the end of the fourth phase of the Erlitou culture. In the autumn season of 2004, we followed this pit and expanded our investigation area. We thus came to confirm that there was a turquoise workshop of no less than 1000 sq m, which came into use at least back to the third phase of the Erlitou culture.

## V. Conclusion

The crisscrossing road network, the rectangular palace complex, and the axis-principled complex of foundations, indicate that the Erlitou site was a carefully planned, and strictly structured capital. If the palace complex can be defined by the foundation cluster enclosed by the four walls, then the emergence of this type of complex can be dated back to the second and third phases of the Erlitou culture in the Erlitou site, which antedates to the one discovered in the Yanshi Shang city site. The distinctive planning of the Erlitou capital marks a milestone in the search of the origin of Chinese civilization.

The large-scale settlements such as Taosi 陶寺 in Xiangfen 襄汾, and Xinzhai 新砦 in Xinmi 新密, which date prior to the Erlitou period, are agreeable with natural landscape without pursuing any particular artificial form, without any concentrated and orderly foundation cluster

and rectangular palace complex. The settlement pattern of the Erlitou site marks a leap from these enclosed settlements, and resembles more the Zhengzhou 郑州 Shang City, Yanshi 偃师 Shang City and subsequent Chinese capitals. The Erlitou site therefore set the first sample for the following dynasties.

The enclosing walls and Foundations Nos.1, 2, 4, 7, 8 were roughly constructed in the same time in the third phase of the Erlitou culture, and dramatically changed the layout of the palace complex. Among the eastern group of foundations excavated in the recent years, the Foundations Nos.2 and 4, which were constructed in the third phase, as well as No.6, which was constructed in the fourth phase, were superimposed upon the dilapidated site of Foundation No.3. The layout of the complex was thus changed dramatically in the late stage, but the general direction and axis principle persisted. After the completion of construction, the palace complex continued to use the four outside roads, which served as borders throughout the early and late phases. It is, however, still a question to be explored what kind of historical reality reflects the coexistence of dramatic change and continuity in the layout of the palace complex.

The discovery of wheel imprints of the Lower Erligang period in the Yanshi Shang City predates the history of vehicle in China from the late Shang for two and three hundred years. The discovery of them in the Erlitou culture further predates the emergence of wheeled vehicle for about 200 years.

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# A Large Turquoise Dragon-form Artifact Discovered at the Erlitou Site

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From autumn of 2001 through spring of 2003, we undertook a broad-scale survey and excavation in the eastern part of the palace complex of the Erlitou site. The excavation came to discover that the rammed earth structure of the second phase of the Erlitou 二里头 culture and underneath Palace Foundation No.2, discovered in 1978, was the foundation of a large-scale and complex multi-courtyard (No.3). This foundation, which measures over 150 m long and 50 m wide, consisting of three courtyards, is the earliest definable rammed earth structure of the Erlitou culture. In the middle and southern courtyards are found several rows of middle-size burials. We have excavated five of them. They are all pit burials, with cinnabar, coffin remains, bronzes, jades, lacquer wares, white ceramics, hard wares, turquoise artifacts, shell string ornaments, cowries, and ceramic vessels. Stratigraphical evidence and accompanying artifacts indicate that these are synchronic to Foundation No.3, or the second phase of the Erlitou culture. They are also the first rich elite burials discovered inside the palace complex of the Erlitou site.

In spring of 2002, we discovered a large-size turquoise artifact upon the skeleton of the occupant of burial No.3 (02VM3) in the southern courtyard of Foundation No.3. We had technical difficulty in clearing it *in situ*. In order to keep it intact, after collecting relevant data, we moved the entire block, which contains the object, in a box to laboratory. Colleagues from the Center of Science and Techniques of our institute managed to uncover an intact dragon-form artifact in the summer of 2004. In this essay we will describe this artifact.

## I. General Description

02VM3 is a rectangular pit burial, orientation 356 degrees. Its southwestern part was broken into by an ash-pit of the

late Erligang culture. At mouth it is 2.24 m long, 1.10 m wide (the northern side, width of the southern side is unknown), 0.50–0.60 m deep. At bottom it is 2.20 m long, 1.06 m wide at the northern side, and 1.28 m at the middle point. The occupant is laid in the supine and extended position, head north, face east. Part of the skeleton is destroyed. Anthropological analysis identifies an adult male of 30–35 years old. On the bottom is scattered cinnabar, but little is left of the coffin.

This burial is rich of artifacts, including bronzes, jades, turquoises, white ceramics, lacquer wares, ceramics and cowries. A bronze bell, placed at the waist of the occupant and upon the dragon-form artifact, contains a jade striker, and preserves lacquer coating and textile wrapping. To the north of the head of the occupant is a bird-head ornament. In the same area are three white ceramic conic bowls. These vessels each have on the top a circular hole and turquoise beads atop, the two of which might have been connected. They were positioned in a triangular pattern, two upward and one downward; they might have been head ornaments. Lacquer wares are considerable in number and variety. They are found in the four sides of the burial, but concentrated in the eastern side. Identifiable vessels are *gu*-cup, *bo*-bowl, handled vessels; some vessels like *gu*-cup sits on circular ceramic pieces. Ceramic vessels include *jue*-cup, *he*-vessel with cap, *he*-vessel with pipe, *ding*-tripod, *dou*-stemmed plate, *zun*-vessel, and *pan*-vessel. Altogether they count 10 items, but they were all broken, and placed mostly near the eastern wall, partly near the northwestern corner and near the northern wall. Cowries are found near the neck of the occupant, all with drilled holes. Altogether over 90 in number, they were laid in layers, partly in the form of petals. They shall be string ornaments of neck. Near the skull are found two large perforated turquoise beads.