

On the emergence of the domestic chicken as seen from finds of bronze chickens in southwestern China

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Abstract

This paper focuses on the bronze chickens unearthed in southwestern China dating back to the time from the Shang to the Han Dynasties. Among them, one bronze rooster from the pit No. 2 at the Sanxingdui Site looks similar to domestic chicken in appearance. Since it was unearthed together with bronze birds symbolizing the Sun, we may deduce that the bronze rooster probably symbolizes an idea that rooster crows at sunrise. In addition, most other bronze chickens unearthed in southwestern China are used as staff-head. This pattern perhaps is related to the fact that rooster crows and can be used for timing. The author concludes that the study of these bronze chickens, including their typology and archaeological background within the context of the biological habits of relevant animals as well as corresponding cultural phenomena, can to a certain extent help us identify the species of such animal-shaped artifacts and further supplement the identification criteria of domesticated animals.

Keywords: Ceremonial staffs; domestic chickens–history; *Gallus gallus* (species)

Origin of the problem

In the field of archaeological research, the origin of domesticated animals is a very important point of discussion. In China, research on domesticated animals mainly centers on early written records and the “six domestic animals (六畜)” that since early times have been closely connected with the daily lives of people, the chicken being among them.

Recent advances in the study of the origin of domesticated chicken have been made by scholars such as Hui Deng et al (2014). In the study, they suggest that some of the remains of domestic chicken (*Gallus gallus domesticus* Brisson) reported in China in the past may actually have been common pheasant (*Phasianus colchicus* Linnaeus) or red junglefowl (*Gallus gallus* Linnaeus). Thanks to progress made in the study of bone morphology of chickens, a set of characteristic has been identified that can be used to distinguish between common pheasants and chickens, but as the red junglefowl and the domesticated chicken are particularly similar, we need to develop finer methods to distinguish between them.

The study also proposed six criteria by which we can identify domesticated chicken, namely the morphological characteristic of the chicken bones, their measurements, the sex ratio, and archaeological phenomena, artifacts, and historic textual material.

In the process of identifying domesticated chicken, methods from zooarchaeology or molecular biology can provide direct evidence for the evolution of the chicken, but in the case of artifacts and other archaeological remains, we have to interpret the evidence to reach any further conclusions. This paper focuses on the pottery chicken and the bronze chicken found in southwestern China that have received a considerable amount of scholarly attention, discussing a few details on the criteria by which artifacts and other material can serve to throw light on the pertinent issue.

Pottery chickens unearthed at Dengjiawan

Some of the earliest and most ample artificial evidence on domesticated chicken are the pottery chicken figures unearthed at the prehistoric Dengjiawan Locality of Shijiahe Site in Hubei Province.

In the 1970, scholars found pottery chicken on the surface of the site, suggesting that they might depict domesticated chicken (Liu 1980). Later, ash pits and deposits in depressions revealed over 10000 pieces of pottery figures (Joint Archaeological 2003), all of them red fine clay pottery, fired at a low temperature, and hand-pinched into small figures without slip or paint. Of the pottery objects that could be reconstituted, there were 193 animal figures, among which domesticated animals such as dog, pig, sheep/goat, rabbit, cat, various types of chicken, and birds, and wild animals such as monkey, elephant, tapirs fox, fish, and turtles could be seen. Among the 41 chicken figures, there were roosters, hens, and small chickens. The roosters were all bigger than the others, had combs and long tail feathers (Figures 1:1 through 1:3). The hens were smaller, had no comb or only a short one and two wings or none (Figure 1:4). The small chickens had a small head, rounded short bodies and a feather-less tail. These pottery chickens are realistic depictions, but as they were made by hand and the details were not clear enough, it is difficult to tell if they were domesticated varieties. Besides, it is not quite appropriate to determine the species of animals solely based on art objects that were casually produced. The pottery pieces from Dengjiawan did not come from burials and no kiln has been found in the vicinity but because they were found on one side of the cemetery and had been burned, it has been suggested that they were ritual objects; however, this argument does not help in determining the chicken

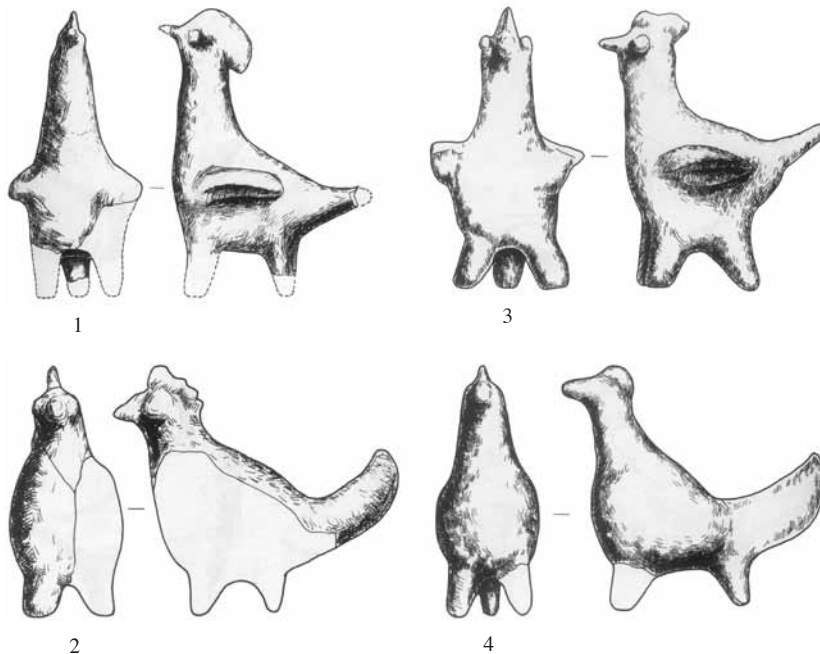


Figure 1 The pottery chickens unearthed at Shijiahe Site.

1. Rooster (T37 ② :4); 2. Rooster (H16:2); 3. Rooster (H4:17); 4. Hen (H16:1).



Figure 2 The bronze rooster unearthed from sacrificial pit no. 2 of Sanxingdui Site (K2 ③ :107).

species. Deng and his colleagues hold that the careless manner of production and the coarse outlines do not allow for determining if the chicken depicted in this manner were domesticated or not as domesticated and red junglefowl have roughly the same outer appearance. Determining the chicken species thus needs to be approached with great caution. Acknowledging this issue reflects a scientific attitude.

Nevertheless, during the time of the emergence of domesticated chicken, artifacts are known that show clear characteristic of domesticated chicken, most prominently the bronze chickens unearthed at Sanxingdui Site in Guanghan, Sichuan Province.

Bronze chickens found in the sacrificial pits at Sanxingdui

From the sacrificial pit no. 2 (K2 hereafter) at Sanxingdui Site, one bronze chicken has been unearthed which dates to the time of the late Shang Dynasty, thus corresponding

with the time period that Deng and his colleagues have suggested for the emergence of the domesticated chicken. This chicken has the form of a rooster with an eagerly-erect head and full tail feathers, the animal standing on a square base. The chicken is 11.7cm long and 14.2cm high (Figures 2 and 3:2; see Sichuan Provincial 1999).

Some scholars hold that the form of this bronze chicken is very realistic, linking it to the mentioning of chickens in *Shijing* (Book of poetry) which shows that at least during the early Spring-and-Autumn Period chicken were already quite common.

This bronze chicken was found next to a group of high-grade bronze ritual objects; it was beautifully crafted, in a realistic style, with clear details, and thus very different from the pottery objects discussed above; the details allow us to identify it as a type of common pheasant. Common pheasants have a beautiful color, the top of the head being yellow, and the neck and throat black. Below the neck there is a white ring, the tail feathers are long and mostly yellow-brown in color with a few black spots (Zhongguo: 2254). The Sanxingdui bronze chicken has a different form, but it is difficult to tell if the bronze chicken is meant to be a red junglefowl or a domesticated chicken. The junglefowl and the domesticated chicken resemble each other, but on the head of the wild chicken there is a fleshy comb and at the throat there is a fleshy wattle; the feathers closely resemble those of domesticated roosters, the main differences being that the feathers on head and neck are elongated and sharp, the feathers are more colorful while the feathers on the body of the red junglefowl are dark red and the tail feathers are black (Zhongguo: 2128).

The Sanxingdui bronze chicken is not color painted and the colors are therefore impossible to determine.

Next to the bronze chicken, a number of other bronze birds have been found in K2 at Sanxingdui, which might be one of the reasons why the bronze chicken has never been mentioned in connection with discussions on the emergence of domesticated chicken. The deeper meaning of the bronze chicken at Sanxingdui and the significance of its appearance next to other birds requires further discussion.

First we will turn to the bronze birds. All of these birds have been found in K2, they appear in significant numbers and various forms, most of them being part of bronze trees and similar objects. On all branches of two bronze trees (K2 ② :94 and K2 ② :194) each has a bird standing on a flower (Figures 3:1 and 3:4). On a small bronze tree (K2 ③ :272) there is a standing bird with a human face. On an “altar” (K2 ③ :296) there are a standing bird and a bird with a human face and there is a sculpture of a human with bird feet (K2 ③ :237) of 81cm height. Furthermore there are an independent bronze bird, a bird-shaped bronze ornament (Figure 3:3), a bird head 40cm high, and a bird-shaped bronze bell. On some of the bronze vessels there are also bird motifs.

In sacrificial pit no. 1 (K1) at Sanxingdui, on the other hand, there are no birds or bird motifs. Therefore, the bronze birds and the objects found together with them in K2 have a special meaning.

The majority of bronze birds was connected with bronze trees, and these bronze trees are generally considered to stand for Fusang (a divine tree and island in the East, from where the sun rises) and Ruomu (a tree in the West where the sun sets), symbolizing the rise and fall of the sun.

In the *Haiwai dong jing* 海外东经 (Regions beyond the seas: the east) chapter of *Shanhaijing* 山海经 (Classic of mountains and seas), it is recorded: “there is a very big tree standing in water. Nine suns occupy its lower branches, and one sun occupies its topmost branch.” In the *Dahuang dong jing* 大荒东经 (Classic of the great wilderness: the east) chapter of the same book, it is recorded: “At the top of Yanggu is the Fumu; one sun is just reaching the crown of this tree, and one is just rising from it. The suns are each carried up on a raven.” In the *Dahuang bei jing* 大荒北经 (Classic of the great wilderness: the north) chapter it is said that the Ruomu is “in the middle of the great Wilderness, there are Hengshi Mountain, the Jiuyin Mountain, and the Huiye (Ash land) Mountain; On the top of Huiye Mountain, there is a scarlet tree with green leaves and scarlet flowers. Its name is Ruomu.” In the *Dixing xun* 墜形训 (Terrestrial forms) chapter of *Huainanzi* 淮南子, it is said that “the Ruomu Tree is to the west of Jianmu Tree. On its branches are ten suns; its blossoms cast light upon the earth.” The bronze trees at Sanxingdui and the transmitted texts therefore may be reflecting a common legend. In this legend, the Fusang is the place in which the sun rises in the east and the Ruomu is the place where the sun sets in the

west, the sun being carried by the bird and the bird thus symbolizing the sun.

In K2 there is a large number of objects that are related to the sun, such as six sun-shaped objects of over 80cm in diameter and sun-shaped decoration on the bronzes. And then there is the large number of human eye motifs, and the protruding eyes on the god masks and the birds with human faces, and of course also the eye-shaped motifs on the bronzes. Some scholars hold that in some legends the eye and the sun have the same meaning (Sun 2000).

It is very clear that the birds in K2 symbolize the sun and that the bronze trees, sun-shaped objects, and eye-shaped objects are all related to sun worship. The objects in K2 therefore might be the furnishings of a temple dedicated to the sun that had been hidden in this fashion (Shi 2004). Based on this interpretation of the background of the unearthed objects, we hold that the bronze chicken should have the same meaning as the objects it was associated with.

One of the outstanding characteristics of the rooster is that it crows before dawn, so it is naturally related to the sunrise. The *Book of poetry* contains a considerable number of records concerning the crowing of roosters. In the *Nü yue ji ming* 女曰鸡鸣 (The woman says the rooster is crowing) in *Zheng feng* 郑风 (The odes of Zheng), it is written: “The woman says: ‘The rooster is crowing.’ The husband says: ‘It is dark dawning.’” In ancient times, in terms of recording the time within a day, “the rooster’s crowing” and the “dark dawning” are the two successive time segments after the “middle of the night.” In the *Ji ming* 鸡鸣 (The rooster has crowed) in *Qi feng* 齐风 (The odes of Qi), it is written: “(the wife says:) ‘The rooster has crowed; it is late. Get up and haste to the court; it is full, for you they wait.’ (The man says:) ‘It is not the rooster’s sound, only the flies buzzing round.’” In the commentary of the twelfth year of Duke Xuan in *Zuo zhuan*, it is said that “those (battle chariots) on the right had stood with the horses yoked from the crowing of the rooster till mid-day (and then released to rest); and those on the left had then been similarly harnessed until sun-down.” In that of the fourteenth year of Duke Xiang in *Zuo zhuan*, it is said that “Xun Yan issued an order that at rooster-crow they (the armies of the allied states) should yoke their chariots, fill up the wells, level their furnaces and look only at his horse’s head (and follow him).” In the *Biography of Lord Mengchang* in *Shiji* (Records of the Great Historian): it is recorded that during the Warring States Period, Lord Mengchang of the Qi State of escaped in the midnight from the Qin State via the Hangu Pass “The law of the pass was that people were allowed to through only when the rooster crowed. the Lord of Mengchang feared that his pursuers would catch up with him. There was a retainer in a low seat who could imitate a rooster crowing. When he did so, the roosters crowed together, the pass was opened and they were allowed through.”

The *Taiping Yulan* 太平御览 (Imperial readings of the Taiping Era) quotes the *Xuanzhongji* 玄中记 (“Stories from the midst of mystery”, a lost book written in the

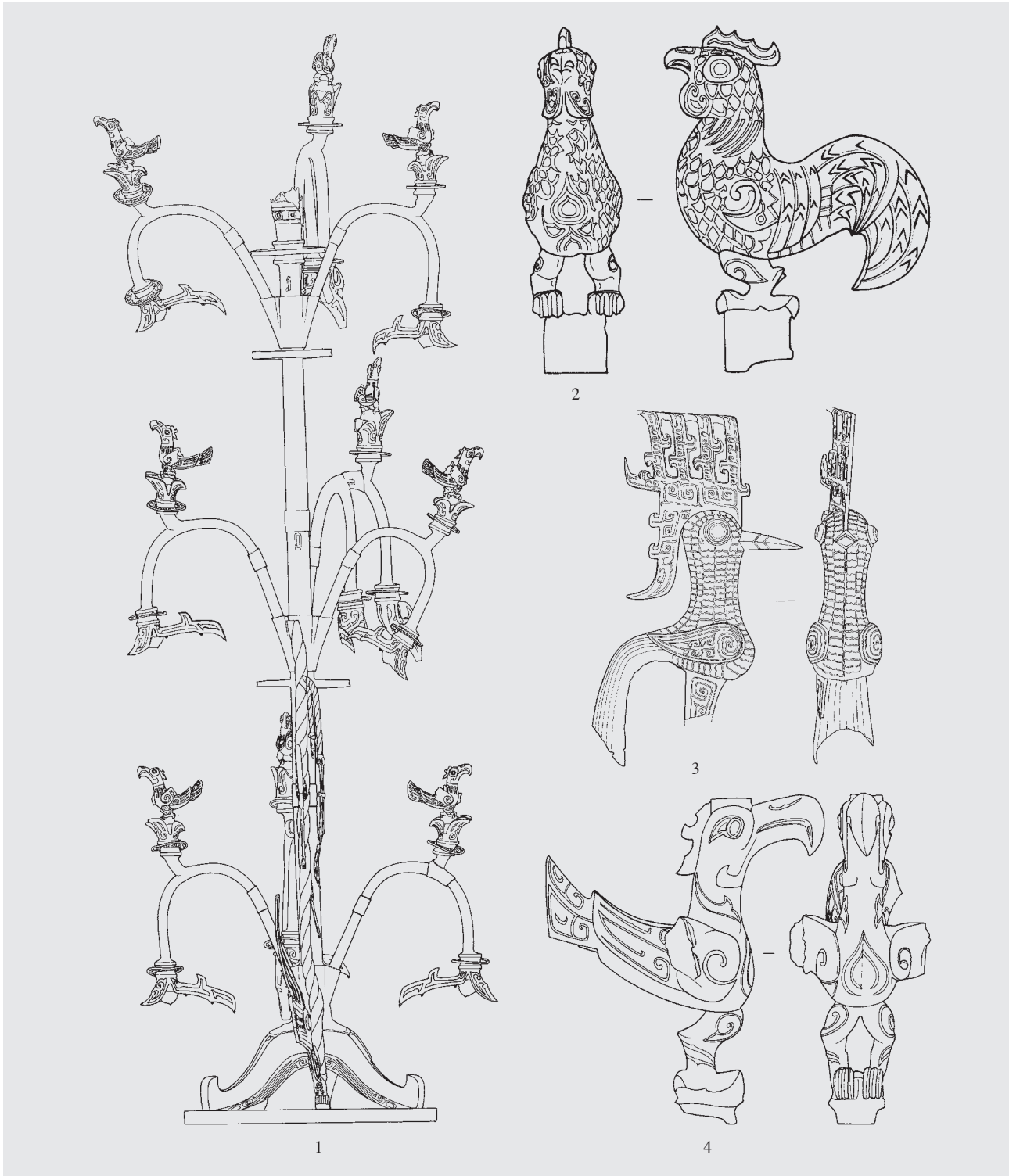


Figure 3 The bronzes unearthed from sacrificial pit no. 2 of Sanxingdui Site.

1. Bronze holy tree (K2 ② :94); 2. Bronze rooster (K2 ③ :107); 3. Bronze bird (K2 ③ :193-1); 4. Bronze bird (K2 ③ :194-1).

Jin Dynasty) saying: “in the southeast there is the Taodu Mountain on whose tops there are large trees called *taodu* whose branches stretch out for three thousand *li*. On

them there perches the heavenly rooster, and as soon as the sun emerges and its rays reach the tree, the heavenly rooster crows and all the roosters on earth chime in with

his crowing.” In this legend we see the heavenly rooster who crows at daybreak and the holy tree in which the heavenly rooster lives. But this is not entirely identical with what is actually written in the *Xuanzhongji* printed in the *Atlas of Ancient Jades* from the Chunxi Era (1174-1189) of the Southern Song: “East of Penglai, there is a mountain called Daiyu and on it there stands the Fusang tree. The tree is ten thousand *zhang* high. On the top of the tree there lives the heavenly rooster and has its nest on top. Every night when midnight comes, then the heavenly rooster crows and the sun crow chimes in; when the sun crow raises its voice, then all roosters on this earth crow (Guo 1973). Contrasting the two references, Guo suggests that “the so-called Taodu tree has changed into a Fusang tree, which is clearly a variation of the legend. From this it becomes clear that the Taodu tree evolved from the Fusang tree. Besides the sun crow there is also a heavenly rooster, which is a particularity of new legends, but the new legends are also not consistent among themselves. One says: ‘The sun emerges, the light reaches the trees, and then the heavenly rooster crows,’ while another says: ‘The heavenly rooster crows and then the sun crow chimes in.’ It is unclear if the rooster comes first and the crow follows or if the crow comes first and then the rooster follows; these are variations of the legend (1973).” Interestingly, in Sanxingdui K2 the bronze holy trees, bronze birds resembling sun crows and bronze chicken resembling sun roosters appear together.

Although the texts are all of relatively later date, they at least show that people were early aware of the domesticated roosters crowing at dawn. Combined with the interpretation of the objects found in Sanxingdui K2, we thus can suggest that the bronze chicken at Sanxingdui symbolized the sunrise. In this context, the chicken and the crow were not ordinary sacrificial objects; they referred to the same context but had different meanings; thus, if the bronze chickens of Sanxingdui are domesticated ones, then they can appear together with wild or even mythical animals.

Furthermore, apart from the issue of the Sanxingdui bronze chicken being domesticated chicken or not, there is one more related issue, namely what kind of rooster would crow at sunrise. Apparently, the red junglefowl roosters likewise crow at dawn, and the sound they make is similar but slightly sharper than that of domesticated chicken, and the cry is not as prolonged (Kuang 1964). But this does not help to determine if the common pheasant has the same crowing habit. Therefore, the author asked the Ornithology Lab at Cornell University for help. He explained to them the meaning and cultural background of “the rooster’s crowing” in ancient Chinese texts and poetry, but according to the lab scientists, the male varieties of pheasant, red junglefowl, and domestic chicken will call any time of the day to attract females, and the domestic chicken crows in the early morning to protect the hens he wants to mate with, and the “announcement of the day” is just a coincidence. This is the scientific conclusion according to which we cannot

say with certainty of the Sanxingdui bronze chicken is a domesticated chicken. The rooster’s crowing at dawn originally is a biological phenomenon, but in ancient Chinese culture it became imbued with cultural meaning. The Sanxingdui bronze chicken is an artifact created by humans for a particular purpose and it has of course also a deeper meaning. There are also a significant number of references on pheasants in the ancient Chinese literature, but they have nothing to do with crowing at dawn, showing that the pheasant had no cultural meaning in this aspect.

Other bronze chicken unearthed in southwestern China

In southwestern China, a considerable number of bronze chicken dating to the Warring-States Period and the Qin and Han Dynasties have been unearthed, most of which were in the form of staff-heads. Some scholars also consider the Sanxingdui chicken to have been a staff-head. Connecting these two bodies of evidence can further our understanding of the deeper meaning of the bronze chicken.

Yanyuan County in Sichuan has furnished a chicken-head staff consisting of nine sections of bronze tubes decorated with fish design; the staff-head has the form of a disc on which a rooster is standing. The staff is 134.8cm long (Figure 4:1, see Museum of the Liangshan 2009). Additionally, a bronze tray with chicken figures was found, which consists of a rectangular bronze sheet as the body, with four chickens made of copper sheets and having the profile of roosters with a stick below the belly, one on each of the four corners. The bronze tray was 16.7cm long, 6.9cm wide, and the chicken was less than 10cm tall (Figure 4:2). From burial M4 at Laolongtuo in Yanyuan a roughly chicken-shaped ornament of 14cm in height and 19.2cm in width was unearthed. Twenty similar chicken ornaments have been collected in other places, all of them clearly resembling roosters (Museum of the Liangshan 2009: 13, 14, 152-155, 172, 173, 175). In recent year, in Yanyuan a considerable number of chicken-shaped staff-heads have been excavated as well as bells with handles on which a chicken is standing (Chengdu Municipal 2011).

Such bronze chicken staff-heads have also been unearthed in great number from stone-cist graves in northwestern Yunnan. From the Warring-States to early Western Han stone-cist grave M14 at Hongtupo in Xianyun, 197 bronze staff-heads have been unearthed, including bird and chicken forms (Museum of Dali 2011). Among the bird-shaped staff-heads there are egrets, mandarin ducks, and ospreys, and among the chicken-shaped staff-heads there are single and double chicken. The single-chicken staff-heads consist of a rooster standing on a drum-shaped or disc-shaped pedestal, or cylindrical socket. M14:40-3 is 17cm wide and 17.5cm high; M14:40-7 is 8cm wide and 11.3cm high (Figures 4:5 and 4:6). The double-chicken staff-heads consist of two chicken standing on a drum-shaped pedestal; M14:42-3 being 13cm high and 5.8cm wide. The characteristics of

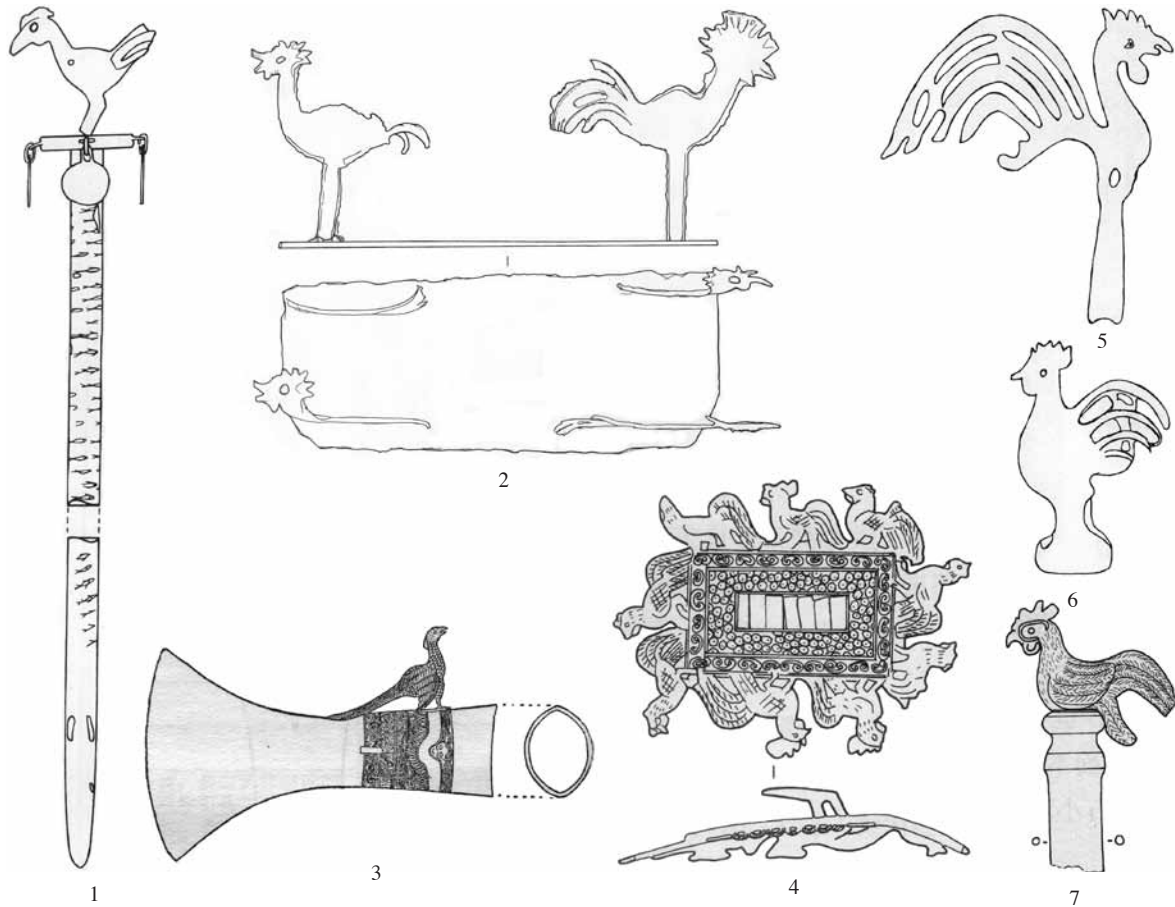


Figure 4 The bronzes unearthed in southwestern China.

1. Chicken-head staff unearthed in Yanyuan (C:9);
2. Tray with chicken figures unearthed in Yanyuan (C:1012);
3. Ax unearthed at Shizhaishan (M12:6);
4. Button unearthed at Lijiashan (M47:154);
5. Chicken-shaped staff-head unearthed in Xiangyun (M14:40-3);
6. Chicken-shaped staff-head unearthed in Xiangyun (M14:40-7);
7. Rooster-shaped staff-head unearthed at Lijiashan (M69:209).

these staff-head chickens and birds are rather distinctive and can be distinguished. From the three Warring-States to Western Han stone-cist burials at Jiancun Village in Xiangyun, 11 chicken-shaped staff-heads have been excavated (Dali Prefectural 1983). Among them, M3:3 is 8cm long and 7.9cm high. From a Warring-States wooden-chamber tomb at Dabona in Xiangyun, two staff-heads have been excavated that resemble chickens. One of them is 11.2cm long and 5.4cm high, the other is 11.3cm long and 5.2cm high (Dali Prefectural 1986). At Juli in Midu County, Yunnan, 10 stone burials dating to the early and middle Warring-States Period have been excavated; the stone cave burials among them revealed three bronze staff-heads. Staff-head M4:1 shows a long-tailed bird resembling a rooster of 9.2cm in height. M3:2 and M3:3 are hen-shaped, measuring 5.6cm and 5.8cm in height respectively (Cultural Relics Workgroup 1986). In Binchuan, a group of Bronze Age earthen pit and stone-cist burials has been discovered that contained 29 bronze

staff-heads, all of them coming from earthen pit burial M1 (Binchuan County 1992). The excavators describe the staff-heads as bird-shaped, but they strongly resemble the chicken-shaped staff-heads from Dabona in Xiangyun.

Bronze chicken and chicken-shaped staff-heads have been found in the Lake Dian area as well. The bronze objects of the Dian Culture are known for realistic depictions of animals and their unique style; the chicken among them are very vividly depicted. At Lijiashan Cemetery, 16 bronze staff-heads have been discovered, their tops being bronze drum-shaped with animal or human figures standing on them. Among them, the three staff-heads unearthed from M69 which dates between the late Western Han and the early Eastern Han have chicken on top, one of them a rooster and two of them hens. The rooster is 8.5cm high (Figure 4:7) and the hens have an extant height of 7.7cm (Yunnan Provincial 2007). Some bronze buttons from Lijiashan show chicken as well such as the four bronze buttons excavated from the mid to late

Western Han burial M47; the buttons have 9-10 roosters shown in relief arranged all around head to tail (Figure 4:4).

Hong Liu (2009) holds that these bronze staffs are mainly distributed in the Chengdu Plain, the Yanyuan Basin of southwestern Sichuan, western and northwestern Yunnan, and the Lake Dian area, and there among the elites or shamans of the groups living there at the time; the usage of staffs in southwest China received influence from the Sanxingdui Culture, indicating that the elites of the ethnic groups living in the Southwest adopted the religious beliefs of the Shu. It is therefore not accidental that most of the bronze staffs in the Southwest have chicken-shaped heads. Xiang Lin believes that the powerful clans of the Xinan Yi (southwestern barbarians) did not only use chicken staffs as symbols of status and power, but that these staffs also served as measuring sticks or gnomons, and that “the roosters announcing the daybreak has a direct relation with customs of sun worship,” and that they are also related with the records in the *Xuanzhongji* cited above. The use of chicken shapes on top of poles is not accidental either; quite a number of southwestern cultural groups have the custom of “worshipping birds” that extends also to “worshiping chicken.” Chicken are the most common object of worship, and it is also customary to use chicken to make divinations (Lin 2007). Combined with the discoveries at Sanxingdui, it becomes possible to suggest that the bronze chicken-shaped staff-heads are related to the phenomenon of the rooster’s crow announcing the morning. Domesticated chickens were present long before the Han Dynasty and the chicken on the staff-heads might be domesticated one. If the meaning of the bronze chicken is similar, then it cannot be ruled out that the bronze chicken from Sanxingdui shows a domesticated chicken.

Conclusion

Research on the origin of domesticated animals requires evidence from zooarchaeology, molecular biology, textual studies, archaeology and other disciplines. Through the archaeological analysis on the bronze chicken from southwestern China and their background, we can draw the following inferences:

1. Among artifact produced by prehistoric humans in China there are some that show a clear chicken form and can be distinguished clearly from pheasants; one of these is the bronze chicken from Sanxingdui. Among the bronze objects dating from the Warring-States to the Han unearthed in southwestern China, there are many animal depictions and their features are very distinct and clear. Among them, chicken-shaped staff-heads are rather numerous and the majority of them show domesticated chickens. Interestingly, on bronzes from Yunnan, there are also some pheasants. From the mid Western Han burial M12 from Shizhaishan in Jinning, a bronze ax has been unearthed on which a pheasant was welded; this pheasant does not have a crown, its whole body is covered in feathers, and its long tail hangs to the ground (Figure

4:3), so it is completely different from chicken depictions (Yunnan Provincial 1959). This shows that in depictions on bronzes of this period, chicken and pheasant figures were clearly different.

2. Distinguishing between domesticated chickens and red junglefowl depicted on artifacts, on the other hand, is more difficult, because the ancestor of the domesticated chicken is the red junglefowl and the two are very similar in figure. Hui Deng and other scholars have pointed out that the bone morphology cannot be summarized in a way that would allow for effectively distinguishing between domesticated chicken and red junglefowl, and this applies to the bronze objects as well.

3. The investigation into artifacts and their archaeological background helped to identify various kinds of chicken. The interpretation of the bronze chickens unearthed at Sanxingdui and various places in southwestern China indicates that if these chickens were domesticated ones then they occurred together with red junglefowl. In other words, the fact that the wild animals occurred together with them does not prove that no domesticated animals were present, but to the unscientifically unearthed artifacts without stratigraphical contexts, it is difficult to judge their nature.

4. According to scientific observations, it is not only the domesticated rooster that crows at dawn. Nevertheless, we can still make some inferences: based on various types of evidence, we can infer that in the past people used the behavior of various types of animals (such as the rooster announcing the dawn by crowing) and that such habits only occur with domesticated animals or that such behavior was highlighted only in particular cultural contexts, then such behaviors may help to identify animal species, and this kind of evidence can enrich the criteria we have to distinguish domesticated animals from their wild counterparts.

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Postscript

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