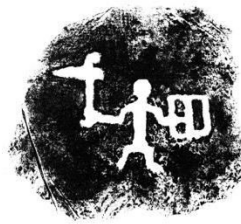


Roles of Weapons: Significance, Identity and Value in Anyang late Shang (c. 1200- 1050 B.C.) Society China



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ABSTRACT

Weapons of the late Shang (c.1200-1050 B.C.), characterised by their frequent discovery and various forms and materials, have often been dogmatically deciphered as either symbolic signifiers or representing military equipment. Adopting an object biographical approach, the main objective of this thesis is to employ the corpus of weapons to explore the martial facet of Shang society. Multiple strands of evidence have been compiled for the investigation: two datasets composed of over 200 complete tombs with their assemblages from the Anyang site of the late Shang, finds from non-burial contexts, the British Museum bronze weaponry collection, and contemporaneous texts. Using for the first time both statistical tools and metalwork wear analysis, this thesis challenges our understanding of the weapons of the Shang from their classification in archaeological reports to their functions and roles in society. The diverse types and materials of weapons and their multifaceted functions also shed light on interactions between objects and human beings.

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Chapter 1 Introduction

Large-scale bronze production is one of the most distinctive features of the Shang 商 period (c.1600-1050 B.C.) (Table 1.1 Chronology). Vessels, as attested by their quality, quantity, decoration and size, seem to have been the preferred form. Huge amounts of resources and craftsmanship were invested in the manufacturing of the vessels. For instance, the ‘*Simuwu*’ ‘司母戊’ (mother Wu) cauldron, the largest Shang vessel known, weighs approximately 900 kg and is over 130cm high with elaborate decoration (see Figure 1.1).¹ Meanwhile, weapons, another main category of bronzes, seem to have been invested with fewer resources and display lower levels of production technology.² Does this disparity in economic and technological investment indicate that weapons were secondary to vessels?

Previous artefactual research has contributed significantly to our understanding of weapons. Studies of individual weaponry forms have provided a solid chronological and typological framework upon which further research can be built. Typological studies have also facilitated greater understanding of cultural variations in weapon forms.³ Weapons have been utilised in

¹ There is debate over the interpretation of inscribed texts in the bottom of the vessel, see Chang Yuzhi 2013. It is said to have come from Xibeigang M260, probably the burial place of ‘Muwu’ ‘母戊’ (mother Wu), the mother of a Shang king, see Zhongguo shehui kexueyuan kaogu yanjiusuo Anyangdui 1987; Li Weiming 2014. On the casting technology of this cauldron, see Feng Fugen et al. 1981; Song Shudi 1998. For referencing scholars in this thesis, a dual system has been applied. For non-Chinese scholars, I will use their surnames following common practice. For Chinese scholars, I will use their full names, surname first, to avoid confusion. For the transcription of Chinese names from mainland China, I will use the *pinyin* 拼音 system. With names from Taiwan and Hong Kong, I will follow the Wade-Giles system. For scholars with various transcriptions of their names, I will adopt the most commonly used ones.

² The heaviest weapon found so far is 9kg (M5:799, length 39.5cm) from Xiaotun M5, see Zhongguo shehui kexueyuan kaogu yanjiusuo 1980. Weapons were made using bi-valve clay moulds and many are plain or with little decoration, though this might have been practical considerations of weapons in terms of weight, size and decoration.

³ E.g. Chen Zhida 1989; Li Jianmin 2001; Guo Peng 2004; Guo Yanli 2014.

inferring the identity and status of tomb occupants.⁴ Research into Shang military equipment and organisation has also benefited from assemblages of weapons in tombs.⁵

Despite this, there are issues with typology and classification in material studies of the Shang.⁶ For example, food and drink vessels are termed *liqi* 禮器 (ritual bronzes) by default in archaeological reports, but any bladed items are categorised as either weapons or tools. Assumptions regarding the function of vessels confine our understanding and become a barrier to further interpretation and research. As ritual bronzes have been the primary material evidence employed in research, ritual interpretations have dominated our perceptions of the Shang,⁷ as can be seen, for example, in the highly regarded *Cambridge History of Ancient China: from the Origins of Civilisation to 221 B.C.*⁸ Meanwhile, recent years have seen an increase of interest in exploring the roles of warfare and violence in Shang society.⁹ These studies have revealed the prevalence of conflicts and violence in the period. However, weapons, the principal object type most intimately associated with martial practice and warfare, were featured less than textual evidence in these studies. Accordingly, the question that is central to this thesis is what weapons can tell us about the martial aspects of Shang people and society. Further questions include how the value of weapons was perceived by the

⁴ E.g. Guo Yanli 2014.

⁵ E.g. Shi Zhangru 1950; Liu Yiman 2003.

⁶ This has attracted scholars' attention in more recent years. Hein (2016) published a review of typology in Chinese archaeology and Xu Jian's monograph (2015) highlighted the category barrier in weaponry research.

⁷ On the chapter of Shang Archaeology, see Bagley 1999. Works on ritual vessels, e.g. Bagley 1987, 1992, 1999; Rawson 1990, 1998, 1999; Li Boqian 1998; Chen Jian and Liu Yu 2011; Zhu Fenghan 2013. The significance of bronze vessels to the Shang is closely linked to their function as a medium to offer food and drink to ancestors and spirits in ceremonies, which would bring beneficial reciprocity to the living and dead, see Keightley 1983, 1999 and 2000; Puett 2002.

⁸ Bagley 1999.

⁹ A number of scholars have discussed the importance of violence in Shang society, see Yates 1999; He Nu and Pahl 2005; Underhill 2006; Campbell 2007, 2014; Rawson 2015.

Shang. Various materials of weapons (mainly bronze and jade) have been studied separately and weapons from non-funerary contexts (such as workshops, sacrificial pits and building foundations) remain largely unexplored.¹⁰ Little is known about whether the bronze weapons in tombs were used for fighting before deposition and indeed whether they were effective killing implements.

This study intends to use weapons to shed light on the martial facets of Shang society, a perspective that has often been overlooked in previous research focusing on ritual aspects of the Shang. It will compile multiple strands of evidence: weapons of various materials and forms (Table 1.2 and Figure 1.2), their archaeological contexts, the British Museum Shang weaponry collection, and contemporaneous texts. Advocating a shift away from the simple ‘weapons=war implements’ and ‘deceased with weapons=professional soldiers’ paradigms, I propose to untangle these presumptions with the aid of statistics and the application of an object biographical framework. These represent the first time either of these approaches have been applied to the study of Shang weapons. A pilot study of metalwork wear analysis will reveal aspects of the birth and life stages of weapons, and facilitate discussions on the degree of their lethality in practice. Tracing weapons through their various life stages enables us to explore the ways in which their value and significance have been embedded, gained and expressed. Throughout the study, I will also explore the ways in which weapons interacted with human beings. Weapons acted as mediators between the Shang people and the physical and spiritual worlds, shedding light on the interactions and negotiations between materials and human beings.

¹⁰ E.g. sacrificial pits at the Panlongcheng site, see Hubeisheng wenwu kaogu yanjiusuo 2001; building foundations at Anyang, see Shi Zhangru 1959.

In this thesis, the main objective of my analysis is over 1500 bronze and jade weapons of various types with related archaeological evidence. They were drawn from c.200 complete tombs at the site of Anyang, Henan province (Map 1), considered to be a capital of the late Shang (c.1200-1050 B.C.).

Organisational overview of the thesis:

Having provided an overview of past approaches (Chapter 2), I propose to employ an object biographical framework with the aid of statistical tools and metalwork wear analysis to shift away from a static view of weapons to a dynamic and holistic approach (Chapter 3). Chapter 4 presents the historical setting of this research and the objectives of study. Data sources are discussed in Chapter 5, as well as their limits and potential for this research. Chapter 6 summarises the results from the application of metalwork wear analysis to Shang weapons in the British Museum collection. Chapter 7 is devoted to the production of bronze and jade weapons, including discussions on the sources of raw materials, technology and skills required, and the organisation of workshops. By tracing the production process, the aim is to understand the value embedded at the ‘birth’ of objects. In Chapter 8, investigations are carried out on the presence/absence, quantities and forms of weapons in the tombs of elites and lineage members. I also explore martial identities of the deceased who were buried with weapons. Case studies will examine the functions and use of individual weapon types. Chapter 9 starts from addressing the issues of non-burial deposit interpretation and is followed by a case study of weapons in sacrificial pits using a biographical approach. Arguments presented in previous chapters will be synthesised in Chapter 10. The potential and limitations of this research will be reviewed and debated, and suggestions made for future work.

Chapter 2 Setting the stage: historical background, subject of study and literature review

This chapter sets out the research background for the current study. The development of Shang weapons is inherently related to pieces from earlier periods in both form and material. Jade has been employed to produce weapons since the Neolithic (c.7000-2000 B.C.). Dagger-axes, the most common Shang weapon form, have been found at Erlitou culture (c.1900-1500 B.C.) sites. Before introducing the diversity of Shang weapons, it is useful to trace a narrative from the Neolithic to the Shang to provide the historical background for this research. I will then provide a review of previous weaponry studies.

2.1 Historical background

2.1.1 Neolithic (c.7000-2000 B.C.)

The emergence of the Neolithic period saw many cultures flourish within the boundaries of present-day China, and it was characterised by the use of polished stone tools, pottery making, sedentary agricultural practice, hemp and silk textile production, and structured ritual practices.¹¹ Notably, jade objects featured prominently in a number of these cultures from around the 6th millennium B.C.¹² The two best known jade-using cultures are the Hongshan 红山 (c.4700-2900 B.C.) in the northwest and the Liangzhu 良渚 (c.3300-2000 B.C.) in the lower reaches of the Changjiang (Long river, also known as Yangzi river) 长江 (Map 2).¹³

¹¹ Zhongguo shehui kexueyuan kaogu yanjiusuo 2010.

¹² You Rende 2002.

¹³ For a comprehensive introduction to the Hongshan culture, see Guo Dashun 2005. For major reports on Hongshan sites, see Liaoningsheng wenwu kaogu yanjiusuo 2012. For Liangzhu culture sites, see Sun Zhixin 1993; Zhejiangsheng wenwu kaogu yanjiusuo 2003, 2005a, 2005b, 2005c; Qin Ling 2013.

The following is a brief account of the latter culture and its jade use as an example to demonstrate the prominence of jade in some of the Neolithic cultures.

The Liangzhu culture emerged after the Majiabang 馬家浜 (c.5000-4000 B.C.) and Songze 松澤 (c.4000-3300 B.C.) cultures, and its sites were distributed in the Taihu 太湖 region, mainly in present-day northern Zhejiang 浙江 province, southern Jiangsu 江蘇 province and western Shanghai 上海. The Liangzhu culture was marked by a number of new features, for example craft specialisation, hierarchies in burial practice, the emergence of urban centres, and networks of jade exchange in the region and beyond.¹⁴ The centre of the Liangzhu culture, named the ‘Liangzhu Site Complex’, consists of over 130 associated sites in an area of 50 square kilometres in a suburb of Hangzhou 杭州. Notable remains include the Mojiashan 莫角山 settlement, the Huiguanshan 匯觀山 and Yaoshan 瑤山 rammed earth platforms, the Fanshan 反山 and Yaoshan 瑤山 elite cemeteries, and the Liangzhu city site.¹⁵

Large numbers of jade objects were uncovered at Liangzhu sites and primarily came from tombs. At Fanshan, an elite cemetery, 11 tombs yielded over 3200 jade artefacts. Their forms varied, e.g. ceremonial implements, ornaments, tools, and, of particular interest to this study, weapons. The material, craftsmanship and nature of depositions suggest that jade artefacts were highly valued. Considering their exclusiveness in large elite burials, they were likely to have been employed as markers of social hierarchy at Liangzhu. At the elite M14 burial (size 3.5m x 2.1m x 0.9m) at the Fanshan site, a total of 388 objects were uncovered, of which 370

¹⁴ Qin Ling 2013.

¹⁵ Zhejiangsheng wenwu yanjiusuo 2005b, 2008.

were jade.¹⁶ Of particular interest is the presence of a jade broad flat axe head (M14:221). Fitted with a jade cap and terminal, it has a 70cm long wooden shaft which has now perished, but was identified by the numerous in situ jade beads once inserted along the surface (see Figure 2.1). Based on its relative location to the skeleton, it is likely that the broad flat axe was held by the deceased in the left hand. Jade broad flat axes have been seen in other large elite burials as well, such as Fanshan M12, M16, M17 and M20. It was suggested by the excavators that it was a ‘sceptre’ for high elites and symbolised military power.¹⁷

Liangzhu and other Neolithic cultures gradually faded away, but the technology of jade making and its use continued and would form a significant part of the material culture in the following periods.

2.1.2 Erlitou (c.1750-1530 B.C.)¹⁸ and the introduction of metallurgy

The Erlitou period has been regarded as the dawn of the Bronze Age in China as the type site, the Erlitou site at Yanshi 偃师, Henan province, has revealed the earliest metallurgical evidence in the Central Plains (Map 2).¹⁹ The concept of metallurgy does not just apply to the use and possession of metal objects, but to a complicated process that involves mining natural ores through to finished products. It has been proposed that metallurgy was introduced from the Eurasian Steppe through Xinjiang 新疆 and the Hexi 河西 corridor in present-day

¹⁶ Zhejiangsheng wenwu kaogu yanjiusuo 2005a, 94-135.

¹⁷ *Ibid.*, 373-374.

¹⁸ This chronology is based on the most recent radiocarbon work on the Erlitou site, see Zhang Xuelian et al. 2005; Zhongguo shehui kexueyuan kaogu yanjiusuo 2014.

¹⁹ Thorp 2006.

western China, where numerous bronze tools, weapons and ornaments were found at Qijia 齊家 culture sites, dating to 2200-1800 B.C. (Map 3).²⁰

The Erlitou period has been conventionally divided into four phases based on the ceramic typology.²¹ Located between the Luo 洛 and Yi 伊 rivers in western Henan province, the Erlitou site occupied an area of 300ha at its peak. However, only a small proportion of the overall site has been uncovered by the limited fieldwork carried out. A number of large building foundations with courtyards surrounded by pounded earth walls, commonly interpreted as palace/temple complexes, were unveiled together with houses and workshops. Scattered tombs were found around the site and a few medium sized tombs were discovered near the palace/temple complexes. Though traces of ditches were found, there is no indication of walled enclosures at Erlitou. The site has been associated with the Xia 夏,²² the first dynasty in transmitted texts, though no direct evidence, such as contemporaneous written sources, has been uncovered at the site to confirm this connection. It has also been considered to be the capital of the first state in China.²³ Evidence includes a four-tiered settlement structure, the palace/temple complexes, craft specialisation and military expansion. However,

²⁰ Linduff 2006; Li Shuicheng 2005; Mei Jianjun 2009. Current theories of the invention of metallurgy have fallen into two camps: 'single invention and diffusionism' (Child 1944; Wertime 1973a, 1973b) and 'multiple centres' (Renfrew 1973). Debate over the invention of metallurgy in China has been divided into three groups: 1. Indigenous invention- based on the few copper and tin-bronze objects from sites of the Yangshao, Longshan, Machang and Majiayao cultures (E.g. Sun Shuyun and Han Rufen 1981; Ke Jun 1986; Su Rongyu et al. 1995); based on highly developed ceramic technology (E.g. Barnard 1961; Barnard and Satō 1975) I don't understand how this last sentence is part of group 1. 2. Imported from outside Definition of 'outside'? (E.g. Loehr 1949; Smith 1973; An Zhimin 1993; Linduff 2006). 3. The combination of western stimulation, interregional interaction and local innovation: based on current finds in Xinjiang and Gansu and the invention of piece-mould technology in central China (E.g. Fitzgerald-Huber 1995; Li Shui Cheng 2005; Mei Jianjun 2003, 2009, 2016;). I find the third argument most convincing, as it best describes current archaeological evidence.

²¹ Zhongguo shehui kexueyuan kaogu yanjiusuo 1999.

²² Zhongguo shehui kexueyuan kaogu yanjiusuo 1999; Xiashangzhou duandai gongcheng zhuanjiazhu 2000.

²³ Liu Li and Chen Xingcan 2003.

the interpretations of some archaeological data seem rather subjective, e.g. linking ceramic styles to military expansion.²⁴ Furthermore, it is problematic to define the Erlitou complex as a ‘state’, as the term and its criteria were developed from elsewhere and should not be universally applied.²⁵

The earliest bronze objects found at Erlitou are small bells and turquoise inlaid plaques. It was not until the third phase (c.1585-1550 B.C.) that vessels and weapons appeared.²⁶ Four types of vessels were found: *jue* 爵 (cup alcoholic vessel), *jia* 罍 (tripod food vessel), *he* 盃 (pitcher alcoholic vessel) and *ding* 鼎 (tripod food vessel). Their shapes were directly inherited from ceramic counterparts. The bronze weapons include dagger-axes and arrowheads as well as knives. The dagger-axes seem to have copied jade ones in form. Though bronze was the new prestige material, jade continued to be valued. Both jade and bronze objects were uncovered exclusively from a few richly furnished tombs. VIKM3, dating to the third phase, one of the largest complete tombs yet discovered, yielded bronzes (one drinking vessel, dagger-axes, battle axes and ornaments), jades (dagger-axes, broad flat axes with notches, handle-shaped objects and spades), ceramics (vessels), turquoise and bone ornaments, and cowry shells (Figure 2.2).²⁷ In contrast to the finds of bronze tools and weapons produced using bivalve moulds in the Hexi corridor, the production of vessels

²⁴ Shelach-Lavi 2015.

²⁵ For a critique of state and other models for ancient societies, see Campbell 2009.

²⁶ Zhongguo shehui kexueyuan kaogu yanjiusuo 1999; Zhang Xuelian et al. 2005.

²⁷ Zhongguo shehui kexueyuan kaogu yanjiusuo 1999.

marked the invention of piece-moulds. Such vessels would feature prominently in societies in the Central Plains until the late first millennium B.C.²⁸

Material remains, e.g. large buildings with platforms, exquisite bronze and jade artefacts, and burials differing in size and richness of assemblages found at the Erlitou site suggest it was a complex society with disparity of wealth between individuals. Many of the Erlitou style materials and technology were inherited by the Shang, who became the dominant power in the Central Plains in the following centuries.

2.1.3 Shang (c.1600-1050 B.C.)²⁹

The Shang period is conventionally divided into three phases- early, middle and late. Although no written evidence has been found, the Erligang 二里崗 culture has been identified as the early Shang (c.1600-1300 B.C.) linking to the Middle Shang (c.1300-1200 B.C.) at Huanbei 洹北, and the late Shang (c.1200-1050 B.C.) at Anyang, based on the similarity of material remains.³⁰ The early Shang period is represented by two large walled sites- Zhengzhou 鄭州 (Figure 2.3) and Yanshi 偃師 in Henan province (Map 4), both

²⁸ Bagley 1987, 1999, 2014.

²⁹ Zhengzhou site, see Henansheng kaogusuo 2001. Panlongcheng site, see Hubeisheng wenwu kaogu yanjiusuo 2001. Taixi site, see Hebeisheng wenwu kaogu yanjiusuo 1985; Huanbei site, see Zhongguo shehui kexueyuan kaogu yanjiusuo Anyang gongzuodui 2003a, 2003b, 2010; Sino-Canadian Huan River Valley Archaeology Team and Zhongguo shehui kexueyuan kaogu yanjiusuo Anyang gongzuodui 2010. Anyang site, see Zhongguo shehui kexueyuan kaogu yanjiusuo Anyang fajuedui 1961; Zhongguo shehui kexueyuan kaogu yanjiusuo 1980, 1994, 1998, 2007.

³⁰ The character ‘商’ (Shang) came from oracle bone inscriptions ‘大邑商’ (*dayi Shang* – the great Shang settlement), see Shima Kunio 1971, 279.2-3; quoted in Keightley 1978, xiv. Though this concept has been generally accepted by most scholars, Bagley remains doubtful on the identification of the Erligang culture as ‘early Shang’, as no writing was found at Erligang sites to testify to its identity, see Bagley 1999, 2014. The dating of Erligangis based on the most recent radiocarbon work, see Zhang Xuelian et al. 2005.

considered to be capitals of the period.³¹ There is also the Panlongcheng 盤龍城 site (Figure 2.4) in Hubei 湖北 province, considered to be an outpost, over 600km south of Zhengzhou in the Changjiang 長江 region.³²

Material remains of the early Shang seem to be the immediate inheritance of the Erlitou culture, as seen from ceramic, jade and bronze typologies, burial practices, human sacrifices and large platformed buildings with enclosed courtyards built using the pounded earth technique.³³ New features also appeared which were comparable with the Erlitou: the Zhengzhou, Yanshi and Panlongcheng sites were enclosed by walls; and the bronze industry further developed, reaching industrial scales.³⁴ With regard to mortuary practices, *yaokeng* 腰坑 (waist pits), have been found widely in Shang tombs and have generally been considered to be a Shang feature. These were small pits that were dug near the waist of the body, often containing dog skeletons or occasionally human sacrificial victims. Divination using animal bones (mainly cattle scapulae and turtle plastrons, but also sheep and pig bones) was widely practiced.³⁵ The Erligang ceramic tradition also spread across large areas, although there is regional variance.³⁶ The wider distribution of Erligang bronzes outside the Central Plains has also been noted by scholars and this phenomenon is termed the ‘Erligang Horizon’, which

³¹ As the material remains were first found at the Erligang site in Zhengzhou, Chinese archaeologists adopted the name ‘Erligang Culture’ 二里崗文化 to describe sites sharing similar features. For the Zhengzhou site, see Henansheng kaogusuo 2001; Yanshi site, see Du Jinpeng 2003.

³² Liu Li and Chen Xingcan 2012; Liu Li 2002.

³³ Zhongguo shehui kexueyuan kaogu yanjiusuo 2003; Thorp 1991; Campbell 2014.

³⁴ For a discussion on the scale of bronze production, see Bagley 1999, 136-155.

³⁵ The practice of divination had a long history before the Shang. For an overview, see Flad 2008.

³⁶ Chinese archaeologists have summarised eight variants of the early Shang based on ceramic typology, see Zhongguo shehui kexueyuan kaogu yanjiusuo 2003. For the latest work on the early Shang, see Campbell 2014.

sees the Erligang as an expansionary state.³⁷ However, such views are based on distributions of one type of material remains, which reflect the dominant status of ceramic typology in studies of material culture in China, as well as the attention given to bronze vessels.³⁸

The next period, conventionally named the Middle Shang by Chinese archaeologists, sees the emergence of a number of bronze-using walled centres as represented by the Huanbei and Taixi sites.³⁹ While less is known of this period, it is rather inaccurate to consider it as simply an interregnum period after the collapse of the Erligang expansion and before the rise of Anyang 安陽.⁴⁰ On the contrary, it is during this period that bronze products, in particular Shang vessels, and possibly their casting knowledge, ‘reached its greatest distribution’.⁴¹

In contrast to the obscurity of the early and middle Shang, the late Shang at Anyang is the period best known. As one of the first sites excavated by the newly established Lishi yuyan yanjiusuo 历史语言研究所 (Institute of History and Philology) of the Zhongyang yanjiu yuan 中央研究院 (Academia Sinica) in 1928, inscriptions from oracle bones have validated the chronology of the last nine Shang kings as recorded in historical texts. Since then, Anyang, identified as a capital of the late Shang, has been viewed as a particularly significant site in Chinese archaeology and has received considerable attention. It is no surprise that

³⁷ On the Erligang Horizon, see Bagley 1977, 1992, 1999, 2014.

³⁸ Yet it is problematic to match remains of material culture to political boundaries/control. Campbell (2014) reviewed this approach while discussing Erligang expansion and highlighted two issues: relationships between ceramic production and distribution/consumption, and ceramic tradition in relation to ethnic groups.

³⁹ Zhongguo shehui kexueyuan kaogu yanjiusuo 2003b.

⁴⁰ Bagley 1999; Liu Li and Chen Xingcan 2003.

⁴¹ Campbell 2014, 122.

Bagley described Shang archaeology as ‘Anyang archaeology’.⁴² Abundant material remains have been revealed over 80 years of systematic excavations at the site (Figure 2.5).⁴³ Distinct from other contemporary cultures (Chapter 2.1.4), the Shang at Anyang had a mature writing system, as seen from the inscribed oracle bones and bronzes.⁴⁴ Quantities of sacrificial pits were found in the so-called ‘palatial temple area’ with large building foundations. The elites practiced divination and employed sets of bronze vessels in rituals to make offerings to ancestors. Jade was highly treasured. Social hierarchy was demonstrated through tombs of various scales, furniture and burial assemblages.⁴⁵ The people at Anyang actively interacted with areas beyond the Central Plains, for example, horse drawn chariots were introduced to Anyang from the Steppe.⁴⁶ Another noticeable feature is the open layout of Anyang with ditches, in contrast to earlier Shang sites that were enclosed by walls. Many other late Shang sites have been identified as well, for example Subutun 蘇埠屯 in Shandong 山東 province, and Taiqinggong 太清宮 and Tianhu 天湖 in Henan province, based on assemblages and typologies of ceramics and bronze vessels.⁴⁷

The Anyang site has yielded some of the richest finds of the period. Though tombs in the Xibeigang 西北崗 royal cemetery were repeatedly looted, their structure and what may have

⁴² Bagley 1999, 231.

⁴³ For a narrative of Shang archaeology and the Anyang site, see Bagley 1999; Thorp 2006. For finds at Anyang, see *Zhongguo shehui kexueyuan kaogu yanjiusuo* 1994.

⁴⁴ Both Keightley (2006) and Bagley (2004) advocate an early unpreserved written system, but Smith (2008) doubted that and argued that a rapid development of the script was possible during the late Shang.

⁴⁵ Tang Jigen (2004) identified six social classes from the perspective of mortuary data at Anyang.

⁴⁶ Introduction of chariots from the Steppe, see Pigott 1974, 16-24; Wu Hsiao-yun 2013.

⁴⁷ For Subutun site, see *Shandongsheng wenwu kaogu yanjiusuo* and *Qingzhoushi bowuguan* 1989. For Taiqinggong site, see *Henansheng wenwu kaogu yanjiusuo* and *Zhoukoushi wenhuaju* 2000. For Tianhu site, see *Henansheng Xinyang diqu wenguanhui* and *Henansheng Luoshanxian wenhuaguan* 1986; *Henansheng wenwu kaogu yanjiuyuan et al.* 2016.

been buried within is at a monumental scale. For example, M1004, considered to be a king's tomb, had four ramps and the central pit measured 17.9m x 15.9m x 12m. Only one corner of the tomb survived, but approximately 1,000 artefacts were uncovered.⁴⁸ One major find is Xiaotun M5, identified as the tomb of Fuhao 婦好 (died c.1200 B.C.), one of three royal consorts of King Wuding.⁴⁹ Its intact condition revealed the largest assemblage of the Shang period ever found - over 8,000 bronze, jade, bone, ceramic, stone, shell and ivory artefacts.

2.1.4 Contemporary cultures to the Shang

While the Shang was the dominant power in the Central Plains area, there were other bronze-using societies in neighbouring regions. Though no written records have been found, archaeological work in the last few decades has uncovered rich material remains. In particular, the Dayangzhou 大洋洲 site in Jiangxi 江西 province and two sacrificial pits at Sanxingdui 三星堆, Guanghan 廣漢, Sichuan 四川 province. Similar objects have been found at Shang sites and in these neighbouring regions, which suggest interactive connections. I will refer to them when necessary.

2.1.4.1 Dayangzhou and sites in Jiangxi

The Xingan 新干 pit at Dayangzhou from Jiangxi province has been one of the major discoveries in 20th century Chinese archaeology, yielding approximately 1,900 objects in total.⁵⁰ Though the excavation report is named *Xingan Damu* 新干大墓 (large tomb from

⁴⁸ Liang Siyong and Gao Quxun 1970. For an inventory of Houjiazhuang M1004, see Appendix 2.4.

⁴⁹ Zhongguo shehui kexueyuan kaogu yanjiusuo 1980. For an inventory of Fuhao tomb, see Appendix 2.1.

⁵⁰ Jiangxisheng wenwu kaogu yanjiusuo 1997.

Xingan), the exact nature of the pit remains unresolved.⁵¹ A wide range of objects were uncovered: ceramics, jade, and bronzes. Based on typological analysis, the Xin'gan pit was dated to the early Shang. Although resembling Shang bronze vessels in form, Xin'gan bronzes display indigenous idiosyncrasies in terms of decoration on particular parts, suggesting a local bronze casting industry under the influence of the Erligang culture. There are also a number of bronze objects unique in their form. The Xin'gan pit has been associated with a local culture, named Wucheng, known for the high quality of its glazed stoneware.⁵²

2.1.4.2 Sanxingdui

The Sanxingdui site is best known for two pits that yielded over 1,700 bronze, gold and jade artefacts and many elephant tusks.⁵³ Located in Guanghan county, north of Chengdu, the capital of Sichuan province, the timespan of the site ran from the late Erligang period to the early Western Zhou. Objects from the pits display unique features. While some food and alcohol vessels suggest links to the Shang, sculpture forms the main category of bronzes (e.g.: standing figures and trees) and some masks (one measures 66cm tall and 138cm wide) are indeed gigantic. There are large amounts of gold. Quantities of jade are mainly in the form of disks and blades of various designs. The deposits seem to be structured- most objects were probably deliberately damaged and burned before being carefully placed layer by layer in the pits with ashes and animal bones. Further remains have been uncovered in recent years and have included a walled city featuring large building foundations, tombs and pottery kilns.

⁵¹ Located on a sandbar, the extent of the pit was unclear and objects were scattered. There were no remains of human bones, except some teeth belonging to three individuals, see Jiangxisheng wenwu kaogu yanjiusuo 1997.

⁵² Jiangxisheng wenwu kaogu yanjiusuo 1997, 192-203.

⁵³ Sichuansheng wenwu kaogu yanjiusuo 1999.

Though the site requires further discovery and synthesis to be fully understood, Sanxingdui is recognised to represent a bronze-using society distinct from those in the Central Plains.

2.2 Shang weapons

In contrast to earlier periods, Shang weapons have two defining characteristics. They were mostly uncovered in large quantities in burials together with vessels, tools, musical instruments and ornaments. The bronze pieces have been generally considered to be weapons the deceased used when he/she was alive which then accompanied them to the afterlife.⁵⁴ The assemblages of weapons in tombs are also diverse in forms and materials (Figure 1.2 and Table 1.2). Major types include dagger-axes (*ge* 戈), spearheads (*mao* 矛), broad flat axes (*yue* 鉞), hooked-head knives, curved-spine knives, and arrowheads (*zu* 鏃).⁵⁵ Materials of weapons vary. While they are primarily made of bronze or jade, some are also in shell, bone and stone. In this section, I will provide an overview of major Shang weapon types and materials, which are the subjects of study in this thesis.

⁵⁴ E.g. Chen Zhida 1989; Liu Yiman 2002, 2003; Shi Zhangru 1950

⁵⁵ I have excluded helmets and shields in this thesis, as they are mainly protective armour. Finds of helmets are relatively rare. Some were probably made of organic materials and do not survive. The only example is over 140 bronze helmets and traces of leather armour in M1004 of Xibeigang cemetery, considered to be a Shang king's tomb, at Anyang, Henan province, see Liang Siyong and Gao Quxun 1970. Traces of shields were found in some tombs, but little survives for further analysis.

2.2.1 Weapon types

2.2.1.1 *Dagger-axes*

‘Dagger-axe’ is the commonly adopted name for *ge* 戈 in English.⁵⁶ The name *ge* comes from inscriptions on the objects themselves (see Figure 2.6). It has a sharp point at the front with a double-edged blade, a tang at the end, and a wooden shaft which was bound to the front part of the tang by cords (Figure 2.7). Bronze dagger-axes are the most common Shang weapons. Generally made of two parts- metal head and wooden shaft, some also had *zun* 簪 (terminals) as additions, probably for standing up, which can be seen from a Shang bronze inscription depiction (see Figure 2.8). To date, very few dagger-axes have been found with terminals. For example, in Fuhao’s tomb, there were 91 dagger-axes but only one terminal.⁵⁷ Dagger-axes uncovered from archaeological excavations were mostly incomplete as the wooden shafts rarely survived. In a few cases, traces of wooden shafts were identified which suggested a length between 60-100 cm.⁵⁸ Remains of the imprints of shafts were also visible on the tangs of some dagger-axes.

Dagger-axes are the first known bronze weaponry in China. The earliest example was excavated from a pit (possibly a tomb) at the Erlitou 二里头 site, Yanshi 偃师, Henan 河南 province, dating to the 3rd phase of the Erlitou culture (c.1600-1550 BC).⁵⁹ Dagger-axes of other materials are also found, notably jade, and form the largest group among jade weapons.

⁵⁶ It is sometimes confusingly translated as ‘halberd’ in English, though they are quite different in form.

⁵⁷ Zhongguo shehui kexueyuan kaogu yanjiusuo 1980.

⁵⁸ Jing Zhongwei 2011, 373-375.

⁵⁹ Zhongguo kexueyuan kaogu yanjiusuo Erlitou fajuedui 1976.

Various types of dagger-axes are mainly divided based on the morphology of the tang, namely the hafting methods. Following Jing Zhongwei's typological study of bronze dagger-axes, there are five types with variants (Figure 2.9).⁶⁰ Though differing in form, they were all made using two-piece moulds. During late phases of the late Shang, *hu* 胡 (bases) with several *chuan* 穿 (apertures) were developed, probably for securing shafts better.⁶¹

2.2.1.2 Spears

The spear, *mao* 矛, is a type of thrusting weapon consisting of a sharp point with a double-edged blade and a socket for the fitting of a wooden shaft (see Figure 2.10). Remains of wooden shafts have been found in a few Shang and Western Zhou tombs, suggesting a length of about 140cm.⁶² The earliest known spears came from the Panlongcheng site of the early Shang (c.1600-1300 B.C.), Hubei province.⁶³ The earliest known example in the Central Plains was found at Sanjiazhuangdong 三家莊東, Anyang, late Shang.⁶⁴ Though the origins of spears remain disputed, it is generally agreed that they were introduced to the Shang from other areas.⁶⁵ Although dagger-axes were the most widely distributed weapons, more spearheads have been excavated than any other weapon type'. However, it was not an even

⁶⁰ Jing Zhongwei 2011.

⁶¹ *Ibid.*

⁶² Ma Dezhi et al. 1955.

⁶³ Hubeisheng wenwu kaogu yanjiusuo 2001.

⁶⁴ Zhongguo shehui kexueyuan kaogu yanjiusuo Anyang gongzuodui 1983.

⁶⁵ Some advocated a southern origin, see Li Jianmin 2001; some suggested a north/northwest influence, see Li Gang 2005; others argued the Shang spears were combinations of both, see Shen Rong 1998.

distribution. Most of the excavated spearheads (over 700) came from one tomb, Houjiazhuang M1004, considered to be the tomb of a Shang king.⁶⁶

2.2.1.3 Broad flat axe

Broad flat axes, commonly known as *Yue* 钺 in Chinese, took the form of axe-tools but have broader bodies and shoulders and are larger in size (see Figure 2.11). The name *yue* comes from transmitted texts and has been widely used in archaeological literature.⁶⁷ Bronze broad flat axes have been almost exclusively found in large sized tombs, usually with large assemblages of objects.

2.2.2 Weapon materials

The main materials of Shang weapons are bronze and jade. So far over 3,500 bronze weapons and 200 jade weapons have been found at Anyang, late Shang.⁶⁸ Bronze weapons are made of copper alloys and cast using moulds. Some of them have decorative patterns and inscriptions, and others are plain. Jade weapons are transliterations of the Chinese term ‘*yubing*’ 玉兵. The term first appeared in *Yuejueshu* 越绝书 (*The History of the Yue State*), and was then adopted by scholars as the name for bladed implements made from jade.⁶⁹ Although jade weapons are named ‘weapons’, they have always been considered to be non-practical implements.

⁶⁶ Liang Siyong and Gao Quxun 1970.

⁶⁷ I will discuss the issue of terminology on the use of *yue* in Chapter 8.2.1.1.

⁶⁸ This is an estimation based on information provided in the summary report of Anyang (Zhongguo shehui kexueyuan kaogu yanjiusuo 1994) and finds of the last 20 years.

⁶⁹ E.g. Yang Mei-li 1996; Lü Jianchang 2006. *The History of the Yue State* tells the history of Yue State during the Eastern Zhou period (770-221 B.C.). It was compiled by Yuan Kang and Wu Ping in the Han dynasty (206 BC-220 AD). For an English translation, see Milburn 2010.

However, no experiments have ever taken place to test their lethality, toughness and endurance.

The numbers of stone and shell weapons found are few. For example, among 90 complete tombs in the Guojiazhuang cemetery, there were no weapons of those materials.⁷⁰ This imbalance may not necessarily reflect what was in use during the Shang and could be the result of many factors. For instance, there might also be large numbers of wood or bamboo weapons, yet they rarely survive due to their organic nature. One possibility is, as the majority of weapons came from tombs, bronze and jade pieces might be the preferred materials to be buried with, while weapons of other materials might be more common for daily use but discarded afterwards. The only exception is bone weapons, mainly arrowheads. A rough estimation by excavators at Anyang is that there were about 20,400 pieces found before 1986, mainly in large looted tombs. For example, in Xibeigang M1001, possibly a Shang king's tomb, 6,583 bone arrowheads were uncovered.⁷¹ Thus, based on current evidence, bronze and jade weapons will be the main focus of this thesis. I will also discuss bone arrowheads in relevant sections. Other bone, stone and shell weapons will be referenced when necessary.

2.3 Literature Review

There has been a large quantity of scholarship on weaponry studies in China, centred on bronze weapons through cataloguing, typology and researching the origins of a particular

⁷⁰ Zhongguo shehui kexueyuan kaogu yanjiusuo 1998.

⁷¹ Liang Siyong and Gao Quxun 1962. As those bone arrowheads were from the backfill of the looted tomb, they were most likely left by tomb raiders due to their low economic value compared with goods of other materials.

type of weapon and military organisation. There has also been interest in the ritual/symbolic meaning of weapons in burials. These studies have presented chronological sequences of various weapon types and their social functions. As previous studies of weapons have been primarily divided by materials, I will follow this division in the review.

2.3.1 Bronze weapons

2.3.1.1 Classification and typological studies

Typological studies have been the primary focus of Shang weaponry research.⁷² One aim has been to establish the chronological development of an individual type of weapon and regional characteristics. The last ten years have seen several monographs dedicated to individual weapon types (dagger-axes and halberds, spearheads, arrowheads and knives) by researchers from Jilin University.⁷³ They have laid good foundations for further research. One innovation is they do not just focus on the advancement in forms but also consider the practical changes developments brought, e.g. increased efficacy. For example, in Jing Zhongwei's 井中偉 study of dagger-axes, he connected the development of blades and tangs with levels of lethality.⁷⁴ He also drew parallels between innovations in dagger-axes and contemporaneous fighting strategies, such as infantry and/or the use of chariots. However, many weapons were taken out of their archaeological contexts and studied from the perspective of a modern geographical area. For example, the geographical setting for Hu Baohua's 胡寶華 work on

⁷² On a comprehensive review of typology in Chinese archaeology, see Hein 2016.

⁷³ Shi Yan 2008; Lü Xueming 2010; Hu Baohua 2011; Jing Zhongwei 2011.

⁷⁴ Jing Zhongwei 2011.

spears is the northern region;⁷⁵ in a study of dagger-axes and halberds, it was the present political border of the People's Republic of China.⁷⁶ Both settings have their merits, but as material remains in the past did not follow modern political boundaries or geographical divisions, the validity of these typological sequences can be questioned. Falkenhausen termed this approach the 'regionalist paradigm', and considered it to have '... arisen chiefly in response to current political realities and needs'.⁷⁷ Based on data interpretation and publications in the 1980s and 1990s, he argued it to be a new manifestation of Chinese nationalism (see Chapter 5.1.2). Hence, more regionalised typological sequences reflecting the extent of attested archaeological cultures are required.

Another interest is building up the Shang style weaponry corpus. Guo Yanli's 郭妍利 book has provided the most comprehensive and up to date survey of Shang weapons of all types and highlighted several issues with previous research.⁷⁸ Based on spatial distributions of weaponry types and forms (Shang and non-Shang), she divided the places with bronze weaponry finds into three areas: Shang core area, area under Shang influence and outskirts of Shang culture. It was an innovative approach, as weapons have rarely been employed for such discussions compared with vessels.⁷⁹ Yet, it assumed a 'central' position of the Shang in relation to other contemporary cultures and emphasised the influence of the Central Plains

⁷⁵ Hu Baohua 2011.

⁷⁶ Jing Zhongwei 2011.

⁷⁷ Falkenhausen 1995, 198-217.

⁷⁸ Guo Yanli 2014. She further developed the 'weapon set' concept from Shi Zhangru (1950).

⁷⁹ E.g. Bagley 1999.

over other regions. In recent years, there has been a shift of interest on the reverse impact.⁸⁰ One example is a study of northern style bronzes (mostly weapons) found at Anyang carried out by Zhu Fenghan 朱鳳瀚.⁸¹ Combining archaeological materials with oracle bone inscriptions, he argued that frequent wars took place between the Shang and northern groups, bringing improvements to Shang weapons and the introduction of chariots.

Little is discussed regarding terminology in typological studies of weapons. In modern English, weapons have been conventionally considered to be implements that cause physical harm. In Chinese literature, *bingqi* 兵器 or *wuqi* 武器 (weapons) are the terms commonly used. A survey of archaeological reports in China shows that opinions differ among excavators on what should be included in the weaponry category. Chen Mengjia 陳夢家 suggested that the distinction between weapons and tools lies in the angle between blades and handles.⁸² Using the example of axes, he proposed that weapons' blades are parallel to wooden shafts while tools are t-shaped. However, these criteria are based on the way forces are applied, which do not necessarily relate to the functions that the terms 'weapons' and 'tools' imply. More recently, Campbell and Xu Jian both argued for the symbolic significance associated with weapons as representations/signs of violence beyond their practical functions in inflicting bodily harm.⁸³ Still, definitions of weapons remain unclear.

The conventional names of individual weaponry types mainly come from three sources:

⁸⁰ Lai Celine 2010; Zhu Fenghan 2013; Rawson 2015. There is also an earlier study by Loehr (1956). His catalogue of Wenner Jannings collection included a stylistic analysis on the origins and outside influence of Chinese weaponry types and styles.

⁸¹ Zhu Fenghan 2013.

⁸² Chen Mengjia 1954.

⁸³ Campbell 2007; Xu Jian 2015.

- Objects which have their names inscribed on them, such as dagger-axes;
- Transmitted texts;
- Names that describe objects' shapes and characteristics.⁸⁴

The first source, the physical appearance of names on the objects themselves would appear to be the most direct evidence of weapon naming and the most accurate primary source, but there are issues to overcome. Subtle variations occur in the shapes of ostensibly similar objects, and it is to be questioned whether object names remained consistent during the 500 years of the Shang period as functions of objects and people's perceptions of them changed through time. The second source, transmitted texts, were not merely quoted for the naming of weapons following the historiographic tradition, but also shaped scholars' understanding of certain weapons, as antiquarians often speculated about an object's functions and usage through names.⁸⁵ One of the main sources of weapon names is the *Kaogongji* 考工記 (*Book of Diverse Crafts*) and catalogues compiled by Song 宋 (960-1279 A.D.) and Qing 清 (1644-1911 A.D.) antiquarians.⁸⁶ As those texts postdate the Shang by millennia, their reliability on weapon names and their functionalities are to be questioned; names were often assumed based on contemporary examples. Using such assumptions to match archaeological finds to transmitted texts can be misleading. Li Chi 李济 was the first scholar to break away from the terminology that came from transmitted texts and propose that both bronze vessels and

⁸⁴ For discussions on the issue of object naming, see Li Chi 1949; Chang Kwang-chih 2010.

⁸⁵ Chang Kwang-chih et al. 1973, 1-3.

⁸⁶ The *Kaogongji* 考工記 (*Books of Crafts*) is the earliest known book on craft technology and was probably compiled at the end of the Spring and Autumn period of the Eastern Zhou (770-481B.C.) and annotated by scholars in the Han 汉 dynasty (206 BC- 220 A.D.). On the date of the *Kaogongji*, see Li Qiufang 2004. On a review of epigraphists and antiquarians' studies of weapons, see Jing Zhongwei 2011.

weapons should be named by their physical features.⁸⁷ Based on the excavated materials at Anyang, he introduced the term *fengrenqi* 鋒刃器 (blade-type objects) to include all implements with blades, and which was later further developed by Umehara Sueji 梅原末治.⁸⁸ This approach has its advantages, as many implements' functions and usage remain uncertain and were likely to be different across various periods. This method has been adopted to some extent in publications from Academia Sinica,⁸⁹ but it did not develop further as a means to infer cultural, social or technological change.⁹⁰

The obscurity of terminology of weapons also raises the issue of classification. In archaeological reports, objects have often been primarily divided by material, such as ceramics, bronze, jade and stone, and then by function. For instance, in the bronze section, objects are subdivided into: ritual bronzes (vessels), tools, musical instruments and weapons. Although widely accepted by scholars, this method of categorisation is misleading. By assuming that all bronze vessels were exclusively used in ritual ceremonies, other bronze objects that may have also played a role in rituals are excluded from this category. This has undeniably had an impact on research into bronze weapons, which have subsequently been associated exclusively with warfare and the military, while eliminating other possibilities by

⁸⁷ Li Chi 1949. See Chang Kwang-chih's review (2010) on the significance of Li Chi's advocacy on the new naming system.

⁸⁸ Li Chi (1949) also developed descriptive terminology for vessels as well. Umehara (1954) named bronze objects with sharp edges- *tongliqi* 铜利器.

⁸⁹ E.g. Shi Zhangru 1947.

⁹⁰ Hein 2016. Yu Weichao (1989) criticised that Li Chi's method may not be effective in observing diachronic changes.

default. One exception is a recent publication of bronze weapons before the Eastern Zhou. Based on contextual studies, Xu Jian 徐堅 argued that weapons were also ritual objects.⁹¹

While classification and typological studies form the backbone of weaponry research, they are just one of the first steps in categorising the materials and not intended to be ends in themselves. As shown above, many studies seem to follow the most common approaches⁹² to map out the various types and their sequences without much justification or debate. This has a profound impact on subsequent weaponry research, and I will discuss how we might mitigate this in Chapter 3.1.

2.3.1.2 Status, identity and gender

Chinese archaeological studies of tomb contents have been preoccupied with identifying mortuary rules that established the social status of the deceased. A common approach to the interpretation of tomb assemblages is through a comparison of various categories of objects alongside tomb sizes, furniture and other features to directly infer the deceased's status, gender, social hierarchy and rank.⁹³ It is no surprise that tomb occupants with large numbers of bronze vessels and weapons have been considered to be military leaders, and others with fewer goods as lower ranking military officers or soldiers.⁹⁴ In particular, certain weapon types, such as broad flat axes and hooked-head knives, have been directly associated with military leaders, as they were found only in a few richly furnished tombs. Some issues

⁹¹ Xu Jian 2015.

⁹² Hein (2016) argued Chinese typology has been heavily influenced by historiography (see Chapter 5.1.2), antiquarian tradition, early Western influence and political agenda.

⁹³ This approach is very much associated with processual archaeology. For examples of notable works, see Sax 1970, 1971; Binford 1971. For examples of this approach in Shang archaeology study, see Tang Jigen 2004; Hu Jinzhu 2010; Gao Xiangping 2011.

⁹⁴ Yang Xizhang and Yang Baocheng 1986; Liu Yiman 2002; Liu Jing 2007.

immediately emerge with this interpretation. First of all, as demonstrated in archaeological and anthropological studies in societies of various periods, mortuary data of past societies cannot be taken as a mirror reflection of the deceased's life or at face value, and should be dealt with cautiously.⁹⁵ Secondly, there is a danger of a circular argument being put forward. For example, the finding of broad flat axes in tombs with large assemblages should not lead to the occupant of every tomb in which they are found being interpreted as a high status military leader. Furthermore, assumptions have been made around the cultural values of weapons in tombs based on modern perceptions. Just as Flad reminded us that 'value systems do not emerge overnight',⁹⁶ we need to fundamentally assess the ways in which weapons were used, both physically and symbolically. The selection of types and materials of weapons in certain tombs represent a deliberate choice, which must have been founded on pre-existing perceptions of those types and materials during the Shang.⁹⁷ This leads us to question what activities weapons were engaged in. Thus, the research of weapons should not just be confined to their final resting places, but expanded to what happened before they entered the tomb, and whether or not some weapons were destined to particular methods of deposition (see Chapter 3.3).

Many scholars have studied distribution patterns of weapons in late Shang tombs in relation to deceased's status and identity.⁹⁸ Guo Yanli, in her study of bronze weapon sets of the Shang, noted that no strict rule on the use of bronze weapons existed, in contrast to ritual

⁹⁵ E.g. Ucko 1969; Pearson 1999, 2003; Thomas 1991.

⁹⁶ Flad 2007, 225.

⁹⁷ C.f. Fontijn 2002.

⁹⁸ E.g. Liu Yiman 1993; Campbell 2007; Guo Yanli 2014; Coomber 2011.

bronze vessels.⁹⁹ She argued that the quantities and types of weapons in tombs were dependant on the status of the deceased as well as their position in the army and military achievement. Campbell's research explored weapons in relation to warfare and violence.¹⁰⁰ His survey showed a significant correlation between weapon quantities and tomb volumes at Anyang, and revealed that about 40% of the male population was buried with weapons. He then suggested that quantities of weapons were related to tomb occupants' status and that 'an ideology of social violence' was favoured by both the elites and common members of lineage groups, which further indicated the significant role of violence in the networks of power.¹⁰¹ Curiously enough, in a later chapter, Campbell also proposed that some variables (including energy expenditure, tomb furniture, bronze vessel sets, broad flat axes, ritual jade, human sacrifices¹⁰² and tomb ramps) were rigidly controlled, while others, such as weapons, were free variations.¹⁰³ If the category of weaponry is treated as a free variant in mortuary practices, it contradicts Campbell's earlier argument on the significance of weapons to the Shang. Coomber studied grave goods from a performance perspective in an investigation of identity

⁹⁹ Guo Yanli 2014.

¹⁰⁰ Correlation significant at 0.01 level, two-tailed, $r=.6$, see Campbell 2007, 191-195. The dataset Campbell employed for this calculation is not made clear, nor the material types for the weapons included in the data.

¹⁰¹ Campbell 2007, 191.

¹⁰² According to Huang Zhanyue (2004) and Campbell (2007), there were two types of human sacrifices: sacrificial victims and death attendants. The former represent those who were beheaded (also dismembered, buried alive and burned), and were often buried in groups without any goods. The best known examples are the thousands of pits with headless skeletons found at the Xibeigang royal cemetery, see *Zhongguo shehui kexueyuan kaogu yanjiusuo* 1994, 100-121. The death attendants, with intact bodies, were mostly placed on ledged platforms or in wooden chambers in large tombs. Some of them had coffins as well as a few burial goods. One example is the six human sacrifices in the wooden chamber of Huayuanzhuang M54, Anyang, which were probably wrapped with straw mats. In particular, there were several unidentified bronze objects found on the back of XZ8, see *Zhongguo shehui kexueyuan kaogu yanjiusuo* 2007, 80. In this thesis, as they are not the focus of study, I will use the term 'human sacrifices' to include both types.

¹⁰³ *Ibid.*

(re-)construction of tomb occupants.¹⁰⁴ From an observation of categories of objects in tombs, Coomber noted that weapons came after vessels and jade as the third important object type for marking identity.

There are also discussions of the deceased's profession through analyses of the qualities and quantities of weapons in tombs.¹⁰⁵ In English and other European archaeological literature, tombs including weapons have often been interpreted as the resting places of warriors.¹⁰⁶ In contrast, in China, the concept of warriors has rarely been employed, but instead discussions have been focused on roles/ranks in a standing army, with the exception of a few undefined references.¹⁰⁷ I will explore the issues surrounding this occupational interpretation, and discuss whether the concept of the 'warrior' is applicable to research on Shang weapons in Chapter 8.2.2.

There has been a long tradition of associating weapons with males and masculinity. The recovery of Fuhao's tomb and the references in oracle bone inscriptions to her leading campaigns and participating in wars have generated numerous discussions regarding gender, military and status.¹⁰⁸ Some have considered that Shang women participated in wars, and that closely defined gender roles were not yet formed.¹⁰⁹ Others have argued that Fuhao was an

¹⁰⁴ Coomber 2011.

¹⁰⁵ E.g. Liu Yiman 1993; Guo Yanli 2014.

¹⁰⁶ On a critic of this approach in European archaeology, see Härke 1993.

¹⁰⁷ E.g. Liu li and Chen Xingcan 2012; Thorp 2006, 42; Zhu Fenghan 2013.

¹⁰⁸ E.g. Linduff 2002, 2006; Guo Yanli 2014.

¹⁰⁹ Wang Ying 2004.

exceptional case and it was mostly males who fought and were buried with weapons at Anyang.¹¹⁰

Overall, much attention has been paid to tombs containing weapons, or an individual weapon type (e.g. spears), mainly bronze examples. Relationships between weapons and other variables in tombs remain disputed. Another issue is that many previous studies were based on observations over a small sample of large tombs with rich grave goods, particularly the tombs of Fuhao, Guojiazhuang M160 and Huayuanzhuang M54.¹¹¹ However, those three complete tombs were unique examples and there are no known comparisons to them at Anyang, or at any other sites during the period.¹¹² I will discuss this further in Chapter 8.1.

2.3.1.3 Depositions of thin and lightweight weapons

Although little research has been carried out on weapons in burial contexts, scholars have identified a number of phenomena regarding weapon burials. Thin, lightweight and fragile weapons were uncovered in some late Shang tombs and metallurgical analysis has shown them to have a high lead content.¹¹³ They were termed ‘*mingqi*’ 明/冥器 (things made for the dead) and were considered to have been made solely for burials.¹¹⁴ This term is problematic and derives from later transmitted texts. As this occurred to a wide variety of materials and

¹¹⁰ Keightley 1999; Tang Jigen 2004; Campbell 2010.

¹¹¹ Fuhao tomb, see Zhongguo shehui kexueyuan kaogu yanjiusuo 1980; Guojiazhuang M160, see Zhongguo shehui kexueyuan kaogu yanjiusuo 1998; Huayuanzhuang M54, see Zhongguo shehui kexueyuan kaogu yanjiusuo 2007.

¹¹² Except the Xingan tomb at Dayangzhou, Jiangxi, but it remains disputed whether it is a tomb or deposition, see Chapter 4.1.4.1.

¹¹³ Liu Yiman 1995; Underhill 2002; Guo Yanli 2006.

¹¹⁴ This phenomenon was first noted among bronze and ceramic vessels and many interpretations were proposed, see Yang Xizhang and Yang Baocheng 1985; Liu Yiman 1995; Falkenhausen 2006; He Yuling 2006.

types of objects through a period of 150 years of the late Shang, the causes might be varied as well as dynamic. I will address this issue further in Chapter 8.3.

2.3.1.4 Archaeological science

A large number of weapons have been subjected to metallurgical analysis, some included in the appendices of archaeological reports and some in research monographs.¹¹⁵ All have appeared in the form of scientific reports with chemical compositions listed. Little discussion has been carried out using chemical results in relation to the objects themselves, except the differing ratios of lead and tin among categories of bronze objects, such as weapons, tools and vessels.¹¹⁶ Most studies have concentrated on the development of metallurgical technology or the origin of metal sources.¹¹⁷ A partial survey shows weaponry research in Europe has often combined artefact studies (typology and metalwork wear analysis) with archaeometallurgy, archaeometry, and experimental archaeology, which have generated fruitful results in revealing multiple aspects of weaponry manufacture, use and deposition (see Table 2.1).¹¹⁸ In contrast, methods, such as metalwork wear analysis and experimental archaeology, have never been applied to the study of Shang weapons in China (see Chapter 3.3.2).

¹¹⁵ Zhongguo shehui kexueyuan kaogu yanjiusuo shiyanshi 1982; Li Minsheng et al. 1984; Ji Lianqi 1997; Zhao Chunyan 2004; Zhongguo shehui kexueyuan kaogu yanjiusuo 2007.

¹¹⁶ Zhao Chunyan 2004.

¹¹⁷ E.g. Yang Gen and Ding Jiaying 1959; Jin Zhengyao 2004.

¹¹⁸ Due to language limitations, this partial survey is only carried out on literature written in English.

2.3.2 Jade weapons

Though termed weapons, bladed jade objects have been generally understood as having a ritual function rather than being practical killing implements. Jade weapons have been included in many catalogues on Chinese jade, such as the catalogue of the Sir Joseph E. Hotung and Grenville L. Winthrop jade collections.¹¹⁹ They provide general introductions to jade as well as outlining its development and are useful references for further research.

Research on jade weapons has focused on two areas: typological study and ritual meaning. In several articles, Yang Meili 楊美莉 has provided a detailed account of the chronological developments of various types of jade weapons.¹²⁰ Yang argued that by the late Neolithic (c.3000-2000 B.C.), jade weapons, embedded with spiritual significance, became objects of ritual and symbols of military power. As with bronze weapons, interpretation has been heavily dependent upon transmitted texts as direct evidence and this tradition has had a strong influence on jade weapon research.¹²¹ Notably, the study of bronze weapons always has remained separate from research on their jade counterparts, with the sole exception of Xu Jian's recent research monograph.¹²² Based on a decrease in the quantity and size of jade weapons overtime, Xu considered that Shang and Zhou jade weapons had interactive relations with bronze pieces but played supplementary roles overall in rituals in comparison with bronze weapons. Jade weapons were eventually replaced by bronzes by the end of

¹¹⁹Loehr and Huber 1975; Rawson 2002. There are also a number of jade catalogues in Chinese. The latest one is *Zhongguo Chutu Yuqi Quanji* 中國出土玉器全集 (Collections of Excavated Jade in China), see Gu Fang 2005. Objects were arranged by current modern provinces and then chronologically.

¹²⁰Yang Mei-li 1996, 1998a, 1998b.

¹²¹Lü Jianchang 2006; Yang Hong 2007.

¹²² Xu Jian 2015.

Eastern Zhou. Although his research focus was the ritual aspects of weapons, Xu did not explain why jade weapons were made and appreciated. It might therefore be more fruitful to investigate the presence of jade and bronze weapons collectively, and their types and quantities in individual tombs (see Chapter 8).

In addition, discussions of weapons of individual materials have led to the neglect of materials other than bronze and jade. There has been little consideration of bone, stone and shell weapons. For instance, as over 20,400 bone arrowheads were found at Anyang,¹²³ their prominence needs to be addressed in the corpus of weapons as a whole (see Chapter 8.1).

2.4 Summary

This chapter has provided a historical background of the period this thesis studies and outline various materials and forms of weapons that form the objective of analysis. The existing literature has contributed our knowledge of weapons. While classification and typological studies laid good foundations of chronological sequences of an individual weapon type, they could also become a burden for further research. As they were based on either texts, modern perceptions or non-testified observations, their reliability remains uncertain. Although the social roles of weapons have been much discussed, the dominant interpretations that weapons marked the military professions and status of the deceased need to be re-investigated using available contextual evidence. Furthermore, few have paid due attention to Shang weapons of various materials as a whole (bronze, jade and other materials),¹²⁴ and data from non-burial contexts. A re-assessment is therefore needed in consideration with the research questions

¹²³ This is a rough estimation based on the summary report of Anyang before 1986, see *Zhongguo shehui kexueyuan kaogu yanjiusuo* 1994.

¹²⁴ Except Xu Jian 2015.

(see Chapter 3.1). Another issue is how we would approach mortuary data, as the majority of weapons came from tombs. Further questions include whether there were any distribution patterns of weapons in tombs and why there were diverse types and materials of weapons in an individual tomb. In order to answer these questions and understand the roles of weapons in Shang society, I propose to approach the study of weapons using the framework of object biography in combination with quantitative and qualitative methods, which I will discuss in the next chapter.

Chapter 3 Methodology

In the previous chapter, I discussed existing approaches to Shang weapons. Though an increasing amount of research is being carried out on weaponry, the classification and terminology in common use has put restrictions on studying patterns of use and functions of weapons. Furthermore, the functions of weapons are unlikely to have been static but they change over time. Even an individual object may have been perceived differently in various contexts by different people. Therefore, I will first discuss terminology and classification. As the majority of materials have come from tombs, I will explore Shang burial practice and its underlying belief systems in order to contextualise the tomb contents. Despite a richness of data for Chinese weaponry research, theoretical frameworks have rarely been applied. An object biographical approach has been adopted in this study to help us build up an understanding of weapons in a holistic and dynamic way. Finally, strategies employed for carrying out the analysis will be outlined.

3.1 Typology and classification

In dealing with archaeological materials, modern concepts of the material world and our assumptions often have an impact in leading scholars to group objects in particular ways. While bronze vessels are conventionally labelled ‘ritual vessels’, many objects with blades are classified as ‘weapons’,¹²⁵ which then are taken for granted as items designed to inflict bodily harm (see Chapter 2.1.1). Similar issue is also prevalent in European archaeology literature. On a review of interpretations of non-burial finds in European archaeology, Brück

¹²⁵ Some are categorised as ‘tools’. In Chinese literature, bingqi 兵器 or wuqi 武器 (weapons) is the term commonly used.

noted that categorical designations were primarily functional, ritual or mixed, while the nature of many deposits remained ambiguous.¹²⁶ The imposition of a ‘ritual/sacrificial’ label does not, by itself, further our understanding of those remains or inform us about the actions behind the ‘ritual acts’. On the one hand, archaeologists do require classification systems to organise the data and enable consistency of discussion in order to identify broader characteristics and trends. Furthermore, the challenge we face is to acknowledge our preconceptions and carry out basic categorisation without being drawn into confusing levels of detail. As the purpose of classification is to organise materials, what we are interested in is what we could infer from categorised objects for underlying patterns that reflect social or cultural practices.

In viewing of issues of classification and typology in Shang weaponry research (see Chapter 2.1.1.), a re-assessment of the materials is therefore needed. Previous studies suggest statistics has been a useful tool to explore any underlying characteristics of objects, and the application of statistics in archaeology has been widely adopted.¹²⁷ It has been generally acknowledged that statistics are a useful tool to explore the full extent of a dataset. When there are large numbers of tombs with multiple variables, statistics enable researchers to identify general trends, which may not be possible in a qualitative analysis, and go beyond a superficial impression. As archaeological data is always a fraction of what once existed in past societies (see Chapter 5.1.1), one advantage of statistics is they are effective to be applied to sample data from an unknown population.¹²⁸ For example, the use of histogram

¹²⁶ Brück (1999) ascribed the function/ritual dichotomy as a product of post-enlightenment rationalism.

¹²⁷ Flad 2001; Chen Jianli 2000; Jaffe 2012.

¹²⁸ Fletcher and Lock 2005; Filed 2005.

presents an overall view of an individual variable (e.g. number of bronze weapons) and also helps to identify any outliers in a visual and easy to comprehend manner. The relationships between variables in tombs can also be explored through the use of multivariate techniques, such as correlation coefficient tests. They are useful in generating patterns in a large dataset that can be not obtained through a case by case comparison study. Yet, it is important to acknowledge the inherent biases in statistics, such as sampling methods, sample sizes and quality, and the applications of particular methods. One issue is the statistical results are absolute but not conclusive in presenting characteristics in the dataset and their interpretation should be always placed into the archaeological contexts. The most relevant issue of all to this research is the subjectivity of typology and classification, as outlined in Chapter 3.1. The application of multivariate techniques is then undermined by those predefined variables.¹²⁹ One solution proposed by Hein is ‘a constant back and forth between analysis and variable selection and definition, combined with clear statements on the questions posed and the variables relevant in their solution’.¹³⁰ In her study of objects from Liangshan, southwest China, she carried out a two-step categorisation.¹³¹ The first step is on the material and its production conditions; the second step is studying the overall shape of objects with assistance of statistical analysis. Those types and categories would remain preliminary. Depending on the specific question asked, there would be new ways of ordering for a re-analysis. Another example is Li Ling’s 李零 study of Chu 楚 bronzes.¹³² The approach he took was adopting the common names as headings to discuss the changing forms and

¹²⁹ Shennan 1997.

¹³⁰ Hein 2013, 34.

¹³¹ Hein 2013, 105-106.

¹³² Li Ling 1991; quoted in Hein 2016.

functions over time, which in turn threw light on co-existence of local trends and supra-regional cultural unification.

I find both Hein and Li Ling's this approach useful and will adapt it with modifications in viewing of research questions posed in this thesis. The strategy is: firstly, I will follow conventional names of weapon types and classification system, as they have been commonly accepted by scholars to avoid confusion. For objects without a conventional name, I name them according to their shape and distinct features (see Chapter 4.2); secondly, depending on the materials and their characteristics, I will set out individual questions. Applying statistic tools to metric data, I will identify commonality or differences in combining with evidence from production and depositional contexts. If disparity is found, I will attempt to re-group and initiate new analyses.

3.2 Shang burial practice

The significance of burials to the Shang, both to the living and the dead, can be demonstrated by the sheer quality and quantity of burial goods, furniture (wood coffins and chambers) and energy expenditure (in terms of the size and depth of the tomb) that was invested in burial construction and usage. The majority of weapons came from tombs, which is the primary data for this thesis.¹³³ Yet, the question arises: how do we interpret burial practices, in particular the tomb contents? One common approach is the 'afterlife' concept. It assumes that the Shang people believed that the deceased would continue to live in another world and all grave goods (including weapons) were deposited to accompany him/her in the next life. The deceased's status, gender, social hierarchy and rank were directly inferred from various

¹³³ Partially this is owing to the archaeology practice in China, see Chapter 5.1.2.

categories of objects alongside tomb sizes, furniture and other features.¹³⁴ This afterlife concept is prominent in burial practices of later periods. For example, based on a detailed analysis of Western Zhou (c.1050-771 B.C.) bronze inscriptions, Hayashi argued that bronze vessels in tombs were intended for the dead to continue to make ritual offerings to their ancestors.¹³⁵ Keightley, followed by Rawson, suggested that this applies to the Shang as well.¹³⁶ Yet, no evidence from oracle bones or bronze inscriptions, contemporaneous texts of the late Shang, indicates that the Shang had similar practice prior to the Western Zhou. Though its origins may lie much earlier, applying it directly to the Shang is fraught with difficulty.

Another danger of the ‘afterlife’ perspective is types of objects were mirror reflections of the deceased’s occupation, wealth, or/and status. For example, the presence of large numbers of bronze weapons in a tomb would indicate strong military associations of the deceased.¹³⁷ However, the large assemblages of weapons in tombs, e.g. over 200 bronze weapons in Huayuanzhuang M54,¹³⁸ may be interred for status display and they were not necessarily used by the deceased. The situation is probably more complicated and we should consider alternative interpretations.

Other theories on mortuary practice have also been proposed. Some have suggested that identity, status, gender, wealth, beliefs, or the authority of the deceased were ideally recreated,

¹³⁴This approach is very much associated with processual archaeology. Examples of notable works, see Sax 1970, 1971; Binford 1971. Example of this approach in Shang archaeology study, see Tang Jigen 2004; Liu Yiman 1993, 2002; Guo Yanli 2014.

¹³⁵ Hayashi 1993.

¹³⁶ Keightley 1999, 2000; Rawson 1998, 1999.

¹³⁷ E.g. Liu Yiman 2002, 2003.

¹³⁸ Zhongguo shehui kexueyuan kaogu yanjiusuo 2007.

reinforced and reconstructed for the benefits of both the living and the dead.¹³⁹ Using burial assemblages in two royal consorts' tombs at Anyang of the late Shang as case studies, Linduff raised issues with current interpretations of mortuary data and proposed a combination of an object biography approach and an understanding of material remains in ritual contexts.¹⁴⁰ She considered late Shang mortuary practice as 'social action', 'a mechanism for shaping beliefs, ideologies and identities', and 'a source of social power' for the elites.¹⁴¹ Others have considered the burying of the dead (including building the tomb, funerary processes, depositions of objects and sacrifice offerings) to be a means to transform the deceased into ancestors.¹⁴² Studies of oracle bone inscriptions have highlighted the importance of ancestors, who sat at the top of the Shang hierarchy, along with Di and spirits.¹⁴³ The ancestors were believed to have the power to bestow blessing or bring harm to activities and practices the Shang engaged in, such as agriculture, hunting and wars. Divination was practiced to consult ancestors on those matters.¹⁴⁴ Huge amounts of resources were invested by the living in order to satisfy the ancestors and receive their assistance. For example, vessels with elaborate decorations were produced to make offerings of food and drink to ancestors.¹⁴⁵ These interpretations have contributed to our understanding of Shang mortuary practice. However, it seems that the complexity of weapons, including the variation,

¹³⁹ Thomas 1991; Pearson 2003.

¹⁴⁰ Linduff 2010.

¹⁴¹ *Ibid*, 18.

¹⁴² Chen Fang-Mei 2000; Puett 2002; Campbell 2007.

¹⁴³ Campbell 2007, 103.

¹⁴⁴ Keightley 1999, 2000.

¹⁴⁵ *Ibid*, 103.

quality and quantity of weapons in tombs, as well as the placement of weapons in various locations, cannot simply be explained from a single perspective.

One alternative approach is Hein's study of the prehistoric Liangshan burials in Southwest China.¹⁴⁶ In combining Morris' three-tier sequence to study burial rituals with an object biographical approach,¹⁴⁷ she developed a model that considers a grave (including structure, body and contents) as a composite. In contrast to the above approaches that interpreted burials and their contents from a particular perspective, Hein's model aimed to reveal 'choice (intentional data), actions (functional data), and outer preconditions (non-intentional data)' of those burials.¹⁴⁸ In particular, following Hachmann and Penner, Hein divided the Liangshan tomb contents into five groups: objects provided for the deceased in the afterlife; the belongings of the deceased; gifts given to the deceased; ceremonial items used as part of the funerary ritual; later additions after the burial.¹⁴⁹ These categories may not exhaust all possibilities, but they presented burial contents in a structured and logical way when understanding of the ideology and beliefs behind the Liangshan burials is extremely limited.¹⁵⁰ Though much more is known regarding the Shang, I find Hein's approach useful in studying weapons in Shang tombs. One example to support this approach is inscribed bronzes from the tomb of Fuhao.¹⁵¹ Based on inscriptions from those bronzes, they (mainly vessels together with a few tools and weapons) can be divided into the following groups:

¹⁴⁶ Hein 2013.

¹⁴⁷ Morris 1992.

¹⁴⁸ Hein 2013, 308.

¹⁴⁹ Hachmann and Panner 1999; quoted in Hein 2013, 312.

¹⁵⁰ There was no written language found in the Liangshan area and very limited fieldwork and research has been carried out, see Hein 2013.

¹⁵¹ Zhongguo shehui kexueyuan kaogu yanjiusuo 1980.

bronzes belonging to Fuhao; bronzes made for Fuhao after her death; tributes/gifts; items related to human sacrifices; others.¹⁵² This is not a complete list that claims to explain all objects in tombs, but a starting point for us to consider weapons as having various possibilities, rather than simply being functional objects used by the deceased. The approach breaks away from assumptions, categorisation and terminology, and clarifies tomb contents into social categories from the deceased's relational perspective. More importantly, it highlights that objects in each group (both individually and collectively) are likely to have unique life histories, of which I will discuss in the next section. Various groups would have differing associations with the deceased as well as diverse functions to perform.¹⁵³ One thing to note is this way of grouping tomb contents is not controversial to the strategy outlined in Chapter 3.1. It offers from an alternative perspective and clarify objects in social categories, of which I will adopt in this thesis.

3.3 Object biography

3.2.1 Past applications and criticisms

The publication of Kopytoff's paper *The Cultural Biography of Things: Commoditization as Process* is generally considered to be the foundation of object biographical approaches and frequently cited.¹⁵⁴ Advocating a shift away from a single static view of objects at one specific point in time, a biographical approach considers objects' functions, meaning, and significance

¹⁵² For details of these bronzes, see *ibid*, 95-99.

¹⁵³ Cf. Hein 2013.

¹⁵⁴ Kopytoff 1986. According to Google Scholar, Kopytoff's article has been cited 4187 times (https://scholar.google.es/scholar?hl=en&q=kopytoff+1986&btnG=&as_sdt=1%2C5&as_sdtp=. Accessed 25th September 2016).

through the accumulation of time, transactions and experience- namely birth, life, and death, as if they were human beings. Since Kopytoff, object biography as a concept and framework that can be applied in the research of archaeology and ethnography has gradually emerged and been recognised.¹⁵⁵ Over the last 30 years, an increasing amount of archaeological research using object biography, in particular a volume of *World Archaeology* titled *The Cultural Biography of Objects*, has emerged.¹⁵⁶ Meanwhile, the application of object biography has also moved away from Kopytoff's narrative view of the birth-life-death stages of objects. Alternative ways of considering object biographies have been proposed and examined, focusing on objects' engagements and interactions with people through material characteristics.¹⁵⁷

One notable contribution to the object biographical framework is Joy's 'relationship perspective', in which he considered objects' biographies as summaries of the social relationships that the objects in question established with people, places and other objects.¹⁵⁸ This perspective is very much rooted in an anthropological view of agency and personhood proposed in works by Gell and Strathern.¹⁵⁹ In his work *Art and Agency: an Anthropological theory*, Gell defined objects through social relationships with others- being both agents that have impacts on others as well as receivers being acted upon.¹⁶⁰ In his studies of Melanesian society in the Pacific Islands, Strathern used the term 'microcosm of

¹⁵⁵ Cf. Joy 2007.

¹⁵⁶ Gosden and Marshall 1999.

¹⁵⁷ E.g. Joy 2002; Gibson 2015; Morris 2011.

¹⁵⁸ Joy 2007, 2009.

¹⁵⁹ Gell 1998; Strathern 1988.

¹⁶⁰ Gell 1998.

relations' to describe how a person is constituted through the sum of his or her social relationships.¹⁶¹

While 'relationship perspective' is a useful approach, its objective need not be confined to interactions between humans and objects, but can also be applied to entanglements between objects themselves.¹⁶² For example, in a recent study of bronze axe moulds and their products in hoards in late Bronze Age Britain, life histories of the moulds were explored. It was suggested that the combined assemblages were likely to have been value embedded as means to display particular cultural choices. The bronze moulds and axes may likely refer to 'genealogical' relationships between moulds and products and possibly their makers and users as well.¹⁶³

Notably, a number of researchers have utilised an object biographical approach in studying weapons, mostly from European prehistory. Two trends can be observed. Some have employed this approach as a metaphor and focused on weapons' intertwining relationships with people. For example, in a study of changing patterns of burials containing weapons from the late Bronze Age to the early Iron Age, those with destroyed weapons were considered to be means of creating heroic warriors.¹⁶⁴ Others have followed the life cycle model (birth-life-death) and synthesised data obtained through various methods, from metallurgy, typology and use-wear analysis to experimental archaeology.¹⁶⁵ In three case studies of weaponry depositions in early Bronze Age Scandinavia, Melheim and Horn demonstrated the complex

¹⁶¹ Strathern 1988, 131.

¹⁶² Rainbird 1999; Hodder 2012.

¹⁶³ Webley and Adams 2016.

¹⁶⁴ Whitley 2002.

¹⁶⁵ E.g. Molloy 2011; Melheim and Horn 2014; Bruno 2012.

social networks weapons were once involved in through biographical accounts of weapons-how meanings accumulated from production to use-life and acts of depositions.¹⁶⁶ Nevertheless, all these studies share a common ground in that the meanings and value of weapons are not static but could be gained and accumulated through various mechanisms, such as performance, associations with particular events/people, and gift/commercial exchange.

Despite object biography being successfully employed in many studies, there are still certain problems with its application. A comprehensive review has been carried out by Joy in his studies of Iron Age mirrors.¹⁶⁷ He highlighted that, despite the high frequency of object biography in papers and conference presentations, many studies lack thorough and in-depth discussions and are mere statements of 'rich' or 'complex' biographies.¹⁶⁸ This inadequacy leads to relationships between objects and people or societies being overlooked. Another possible danger is the emphasis of objects acquiring meaning and value during their active engagements. As demonstrated in several case studies, in an edited volume on biographical approaches to material culture by Hahn and Weiss, it is argued that stationary phases (e.g. being deposited in a hoard) do not necessarily mean being static in time and space.¹⁶⁹ An alternative approach, 'objects itineraries', was proposed and aimed at recognising activeness,

¹⁶⁶ Melheim and Horn 2014.

¹⁶⁷ Joy 2007, 2009.

¹⁶⁸ Joy 2009, 543.

¹⁶⁹ Hahn and Weiss 2013.

transformation, inertness and durability of objects, which I will incorporate into the application of object biography in this thesis.¹⁷⁰

During my own review of some of the most recent papers on object biography, another issue has attracted my attention. Some papers have devoted extensive content to object biographies from production to use-life and deposition, but too often there is an absence of specific aims being addressed.¹⁷¹ It seems that the biographical approach has been applied at a superficial level; that discussions were centred on the objects themselves but failed to critically analyse the objects' roles in specific practices or to explore interactions that people and other objects may have had with those items. This echoes Burström's review of object biographies that 'a built-in risk of constructing cumulative and pre-determined narratives' leads to little understanding of past worlds.¹⁷² He then calls for an approach of 'seeing things through the eyes of the beholders',¹⁷³ though this may not be easily achieved when studying prehistoric societies. In the following section, I will explore the various aspects of an object biographical approach.

3.2.2 Time

Timespan has been a significant element in discussions of the functions and value of objects, focusing on the issue of different interactions between objects and humans at various times.¹⁷⁴ Here, functions refer to purposes, actions or activities that have been performed by

¹⁷⁰ *Ibid*, 1-2.

¹⁷¹ E.g. York 2002.

¹⁷² Burström 2014, 65.

¹⁷³ *Ibid*, 79.

¹⁷⁴ Bradley 2002; Joy 2007; Bruno 2012.

objects, whether or not they have been planned or expected at production. Value can be understood as commonly shared views of objects ‘inherent quality, usefulness and worth. Both terms are not fixed at the birth stage of an object, but evolve through its life biography. One example is a set of six Tang dynasty tomb guardians (object number: 1936,1012.227) that were on display in the China gallery at the British Museum (Figure 3.1). These ceramic figures were produced to be part of a tomb assemblage- guarding the occupant and his/her belongs from evil spirits. After the tomb was uncovered, and probably very quickly so, the set appeared on the antique market. It became a commodity and its money value was likely to be the top priority of the seller. From the museum record we know the objects were purchased by the British Museum in 1936 from a private collector.¹⁷⁵ From the 1990s until June 2016, they were on display as the centrepiece of the China gallery.¹⁷⁶ The label told the visitors those figures are objects of art representing the Tang dynasty’s advanced ceramic technology. The set was also interpreted as archaeological artefacts that informed us the burial practices and belief systems of the Tang. The functions and value of the set change through time. For the craftsmen who were involved in the manufacturing process, these figures were products of their work; they turned into goods for commissioners/buyers; to the people of the time, they were believed to be guardians of the tomb; when they appeared on the antiquities market, they were commodities to the seller, but collectors probably treasured them as objects of arts; when the British Museum acquired the set, they became exemplars of the Chinese collection

¹⁷⁵ Available from the British Museum website http://www.britishmuseum.org/research/collection_online/collection_object_details.aspx?objectId=259386&partId=1&searchText=china+tang+figures&page=1 (accessed 29th May 2015)

¹⁷⁶ The China gallery (Room 33) has been closed for refurbishment since June 2016 till November 2017.

and extensive research has been carried out by curators/scholars;¹⁷⁷ when the set was introduced at a classroom setting, they were part of the material culture for the students to explore multiple aspects of the Tang society. This single example demonstrates the dynamic lives objects may experience, their changing functions and value over time, and the importance of the varying contexts and labels those objects can be associated with. The Tang tomb figures' dynamic identities can be understood as outcomes of changing relationships formed between them and people.¹⁷⁸

Diachronic change can be understood at a societal level. It is possible to study varying physical characteristics of specific objects over longer time periods to infer shifts in wider practices. One example is Rawson's study of Western Zhou bronze vessels. By observing variations in decoration, form and size of those vessels, she pointed out that a 'ritual revolution' took place during the second half of the late Western Zhou that responded to social and political crises, rather than representing a mere development in bronze casting technology or typological advancement.¹⁷⁹ Developments in material, form and decoration do not occur without reason, and must reflect changes in other aspects, such as culture, fashion, belief, technology and/or practice.

Furthermore, it is important to consider the significance of time to past societies. The activities and beliefs of past societies could be shaped through awareness of previous periods.¹⁸⁰ An example is a life history study of Romano-British bracelets.¹⁸¹ Swift illustrated

¹⁷⁷ E.g. Hobson 1921; Rawson 1992; MacGregor 2010.

¹⁷⁸ Holtorf 2002.

¹⁷⁹ Rawson 1989, 1999.

¹⁸⁰ Gosden and Lock 1998.

how the bracelets were re-discovered and re-worked into rings in post-Roman period. Connoted with Roman heritage, the rings became amulets and were popular items for votive offering among the Anglo-Saxon communities.¹⁸² Together with the historical context, this study of bracelets is able to inform us about the wider cultural norms of the transition period from Roman to Anglo-Saxon.

The above discussions show the profound impact that time has in shaping object's functions and value, and also in turn throws light on aspects of a society in a given time period. It is therefore important to consider time and its effect when studying an object's biography.

3.2.3 Life cycles

Mirroring human beings' biographies, an object's life cycle has been considered to be a linear progression of birth, life and death, which is an essential tool in the object biographical theoretical framework.¹⁸³ While many researchers have demonstrated the efficiency of the life cycle model in studying objects, some have pointed out that creating a narrative for prehistoric objects through various stages (birth, life and death) may not be possible, as archaeology may only provide limited evidence for some or all of these.¹⁸⁴ Joy highlighted the objects' inactiveness at some points and emphasised specific times that an 'object becomes alive with certain clusters of social relationships'.¹⁸⁵ Although this concept is useful

¹⁸¹ Swift 2012.

¹⁸² The Roman bracelets were primarily dress accessories and were also symbolic objects representing gender, identity and status, see Swift 2010.

¹⁸³ Ethnographic studies have demonstrated that life cycles can be cyclical way, see Cremo 1999; Artelius 2001; quoted in Joy 2007, 24.

¹⁸⁴ Joy 2009.

¹⁸⁵ *Ibid*, 544.

in prehistoric archaeological research when evidence can be scarce, it may also lead to an over-focus on ‘special events’ in an object’s life. For instance, we may know little about an object’s production, but if we omit the ‘birth’ of the object and focus on later ‘life’ events, we may miss the transitions this object might have gone through from raw materials to finished product, which may be instrumental to understanding how objects acquired different meanings.¹⁸⁶ In addition, there is commonality shared by objects. Knowledge of the life stage of one object may be transferable to another object of similar type. Though it is not possible to reconstruct every detail of a Shang weapon’s biography, I consider that a narrative review of object biography through various stages is still a useful exercise. Tracing an object from its conception to the end of its social life will provide us with a diachronic narrative of its trajectory and its involvement with other objects, places and people, and through this a deeper understanding of an object and its role might be achieved.¹⁸⁷

In the following section, I will use one of the curved-spine knives (M5:1169) (Figure 3.2) from Fuhao’s tomb as an example and trace its life events since it became part of the burial assemblage, following Holtorf’s account of a pot sherd (see Chart 3.1).¹⁸⁸ Though it is a narrative that covers partial life of M5:1169, it is sufficient to demonstrate how the meaning, value and significance of this knife were formed through interactions between people and its materiality.

¹⁸⁶ Morris 2011. This is highlighted in the concept of object itinerary developed by Hahn and Weiss (2013).

¹⁸⁷ Joy 2009.

¹⁸⁸ Holtorf 2002.

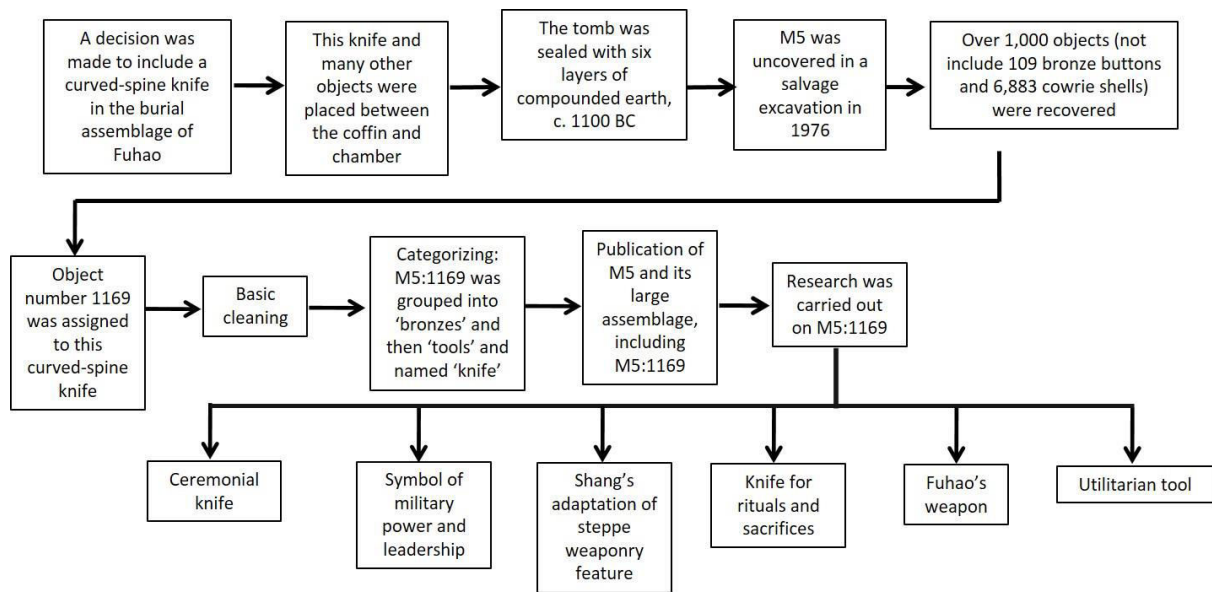


Chart 3.1 Life events of M5:1169 since its ‘death’ (after Joy 2009, Figure 2, 547)

Based on the report’s brief description, photographs and illustration, M5:1169 can be described thus: it has a long and broad blade with alternating right angled protrusions on its back, an upturned tip and a short handle (7.6 cm). It is preserved in moderate condition with traces of a wooden shaft on the handle. Cast decorative bands of bird motifs with geometric patterns are on the upper part of both sides of the blade. There are no inscriptions on the object. Some restoration has been carried out on the tip and back of the blade, as they were slightly damaged.¹⁸⁹

M5:1169 is part of a large assemblage (a total of 1887 objects, see Appendix 2) including weapons, vessels, tools and other items of various materials accompanying the deceased in a tomb at Anyang. This tomb was uncovered in 1976 as part of a salvage excavation for agriculture works and assigned the number 76AXTM5. It is a medium sized (3.92m x 5.6m x

¹⁸⁹ Zhongguo shehui kexueyuan kaogu yanjiusuo 1980.

7.5m) tomb with a rectangular vertical pit that includes one coffin, one chamber, two niches, a ledged platform and one waist pit, and the deceased was also accompanied by 16 human sacrifices and six dogs, which, except for the two niches, is a typical Shang burial.¹⁹⁰ Based on typological studies of ceramic and bronze vessels, M5 is dated to the late 2nd phase of the late Shang. On the evidence of many bronze inscriptions, the location of the tomb, the quantities and quality of goods, in association with oracle bone inscriptions, excavators proposed that the deceased was Fuhao, one of the three royal consorts of King Wuding.

Due to a flood in the main burial chamber, the exact location of M5:1169 and its spatial relationship to other objects remains obscure. Through comparison with other tombs of similar scale, it is possible to suggest that the knife was placed inside the chamber and outside of the coffin together with other bronzes (weapons, tools, and vessels etc.). It is not entirely clear what processes M5:1169 went through after it was recovered from the chamber, but we can speculate on the procedure based on common experience of excavation and post-excavation practices. It would be first assigned a number, hence M5:1169. It would probably have received basic cleaning treatment of removing soil using brushes. It may also have undergone further conservation assessment and treatment if needed. Then, the knife was recorded, including measuring (length 45.7cm), weighing (0.725kg), photography, illustration, identification and classification. According to the report, we know that it was categorised as ‘*tongqi*’ 铜器 (bronze objects), possibly based on its appearance, then ‘*gongju*’ 工具 (tools). No metallurgical analysis has been undertaken on M5:1169, but results from another knife

¹⁹⁰*Ibid.*

and other bronzes in the M5 assemblage indicate M5:1169 is probably copper-tin alloy.¹⁹¹ It was named ‘*dao*’ 刀 (knife) based on its single blade form, and was put in a group ‘*daxing*’ 大型 (large) together with three other curved-spine knives that are similar in form and length. The possible rationale behind these categorisations was the excavators’ perceptions of knife forms (single blades with handles) and function (domestic utility).

As part of the burial assemblage, information regarding M5:1169 was published in the 1980 monograph dedicated to M5. This tomb was one of the most significant finds at Anyang in the 20th century. Since then, aspects of the knife have been discussed, ranging from its naming and categorisation to its social roles, functions and cultural associations. The classification of M5:1169 in the tool category has been questioned by several scholars. Liu Yiman suggested that M5:1169 belongs to the ‘weaponry’ category because of its unusually large size and fine qualities in contrast with utilitarian knives.¹⁹² Some have considered M5:1169 and the type represented by this item to be ritual objects without practical function.¹⁹³ Additionally, as this type is exclusively found in a few tombs with large quantities of objects, in particular large numbers of weapons, they have been considered to be symbols of military leadership and authority.¹⁹⁴ Scholars have also combined textual evidence in investigating M5:1169’s name and functions. In a recent study of bronze knives, Lü Xueming 呂學明 attributed the name ‘*luandao*’ 鸞刀 (knives with bird motifs) from transmitted texts

¹⁹¹ Zhongguo shehui kexueyuan kaogu yanjiusuo shiyanshi 1982, 187.

¹⁹² Liu Yiman 1993.

¹⁹³ E.g. Li Weiming 1988.

¹⁹⁴ Guo Yanli 2014.

to M5:1169 and other similar items, and suggested they were ritual bronzes used for burials and sacrifices.¹⁹⁵

Although the above is just a brief account of M5:1169 following its deposition in Fuhao's tomb, it has illustrated a series of the processes, treatments and transformations the knife has undergone. It has demonstrated the significance of the material characteristics (size, form, material and decorative pattern) which M5:1169 was 'born' with, as well as changing understanding of the knife through different approaches, which reflects the 'momentary, fluid, and flexible' nature of archaeological interpretation to some extent (see Chapters 2.1.1 and 5.1.1).¹⁹⁶ More importantly, M5:1169 became more than merely a tool made of copper alloy, as defined by the excavators, but had multi-faceted biography and played an active part in contributing to our knowledge of Fuhao, burial practices and the Shang military system.

3.2.4 Metalwork wear analysis

While archaeological and metallurgical studies have provided abundant evidence regarding weapons' birth and death stages, little data is available regarding the life stage. Though bronze weapons have been widely considered as killing implement, their practical use remains obscure. The mortuary context that the majority of weapons came from further led the research focused on their symbolic roles. Meanwhile, weaponry research in Europe and elsewhere have developed a method, commonly known as use-wear analysis or metalwork

¹⁹⁵ Lü Xueming 2010. This attribution seems plausible, but misses several key points. In transmitted texts, 'luandao' were described as sacrificial knives with bird motifs but no evidence indicates its shape and size. It is rather speculative to imagine these bird motifs of 'luandao' were the same to M5:1169's. According to depictions of bronze inscriptions, Fuhao 1169 may have a role in sacrifices. Conversely, there are other types of knives that shared the similar functions, and it seems Lü's argument is farfetched.

¹⁹⁶ Hodder 1997, 691.

wear analysis, to study surface marks on metalwork. Based on the quantity of data gathered in combining with results from experimental archaeology using replica weapons, it has revealed many aspects of weaponry use in studies of European metalwork. Research questions included: whether or not weapons were used prior to deposition; if they were capable as killing implements and how frequently they might have been used; re-constructing activities they were involved with.¹⁹⁷ The method is, therefore, adopted in this thesis to study marks on Shang weapon surfaces in order to shed light on their practical functions that is unavailable from other sources. I intend to combine the analysis with typology, contextual studies and contemporaneous texts to obtain an archaeological interpretation of weapons during various stages of their lives, an approach inspired by a study of Bronze Age spears in Italy.¹⁹⁸ Due to limits on accessibility to relevant artefacts and the restricted time available for my DPhil project, objects to be analysed are confined to Shang bronze weapons in the British Museum collections (see Chapter 4.4), generously supported by the Arts and Humanity Research Council Collaborative Doctoral Awards. The following sections provide an overview of the analysis and its application in this thesis.

3.2.4.1 The definition

Studies of surface marks on metalwork with patterns observed from experimental archaeology have been commonly known as use-wear. Metalwork wear analysis, also commonly known as use-wear analysis, can be defined as the study of traces of marks and wear on metal artefacts in combination. In a recent article, Dolfini and Crellin have provided

¹⁹⁷ E.g. Kristiansen 1978; Roberts and Ottaway 2003; Molloy 2004; Bruno 2012; Horn 2013.

¹⁹⁸ Bruno 2012.

the most up-to-date review of metalwork wear analysis and its applications.¹⁹⁹ After surveying previous works, they proposed several changes to the methodology: adopting common terminology; cross disciplinary collaboration in researching wear formation and corrosion processes; utilisation of high-power microscopes; building up and sharing databases of experimental archaeology; applying the methodology to a wider range of materials. They also proposed a new term, ‘metalwork wear analysis’ which defined the scope and approach of the discipline and clarifies its distinction from lithic wear analysis.²⁰⁰ Though it has wider implications than use-wear, currently the most commonly used term, the new name still entails a functional approach that emphasises objects’ use. Traces, resulting from manufacturing processes and post-depositional changes,²⁰¹ seem to have been excluded. Nevertheless, it has its advantages over other terms. Hence, I have adopted it in this thesis and I consider it to also cover all traces and marks observed on weapon surfaces.

3.2.4.2 Potentials and limitations

The methodology was initially developed for the study of stone tools from the Palaeolithic, and then first applied to metals (Bronze Age swords and ornaments from Denmark) in the 1970s.²⁰² Since then, a considerable amount of work, including observations and experiments, on European Bronze Age weapons has revealed the potential and limitations of the methodology. Experiments have included applying weapons with a range of movements, including blows, thrusts, slashes and strikes, against objects made of metals, wood, flesh and

¹⁹⁹ Dolfini and Crellin 2016.

²⁰⁰ *Ibid*, 79.

²⁰¹ E.g. Li Xiuzhen et al. 2011; Roberts and Ottaway 2003.

²⁰² Kristiansen 1978.

other materials.²⁰³ Metalwork wear analysis results have also shed light on the identity of the people who fought with those weapons. On studies of Aegean Bronze Age swords, patterns of damage showed they were used by skilful fighters with controlled application of force and attacking routines.²⁰⁴ Data from the analyses have also been applied to investigate issues within wider social contexts, e.g. economic aspects of social systems,²⁰⁵ social structure and political power,²⁰⁶ and war practices,²⁰⁷ in combination with other evidence.

Concerns have been expressed regarding metalwork wear analysis, particularly concerning metal characteristics. Bronzes can be reworked, repaired and polished, which may have an impact on the reliability and accuracy of this methodology.²⁰⁸ Experimental archaeology is also not without its problems. For example, Bridgford devised a classification system defining and describing cuts, nicks and notches observed from replica sword blades after experimental usage in cutting and combat. She then applied this system to classify different types of damage from ancient pieces to reconstruct their use and infer what kinds of movements and what materials they encountered.²⁰⁹ However, many ancient marks may have been neglected as the classification system was built solely upon observing modern replicas. It is mere speculation to suggest what activities swords might conceivably have been engaged in, such as cutting wood.²¹⁰ It is also important to bear in mind the preservation conditions

²⁰³ E.g. Bridgford 2000.

²⁰⁴ Molloy 2007.

²⁰⁵ Kristiansen 1978.

²⁰⁶ Taylor 1993.

²⁰⁷ Bridgford 2000.

²⁰⁸ Roberts and Ottaway 2003; Horn 2013.

²⁰⁹ Bridgford 2000.

²¹⁰ S. Matthews, personal communication 10th February 2014.

and corrosion products of the swords.²¹¹ An alternative approach was proposed by Matthews, who considered ancient artefacts to be the primary focus, and made detailed recordings of any traces on blades.²¹² By obtaining quantities of raw data from ancient artefacts, it was then possible to establish a clear classification system to interpret the use patterns on weapon blades in relation to a number of technical characteristics- balance positions and centres of percussion.

Another concern for any researcher in his/her project is practicality of execution of the chosen method and access to materials/data within the time allotted for the said project. For instance, some of the types/kinds of compositional analyses are invasive and involve taking samples from objects, such as EPMA.²¹³ The application of metalwork wear analysis is both effective and non-invasive, as demonstrated by studies discussed above.

Drawing upon previous research on European weapons and the issues raised therein, I will adopt the metalwork wear analysis with caution. As a first attempt, this pilot study has the potential to open up a window on weaponry research.²¹⁴ It will shed light on weapons' use-life as killing implements, a key stage in the framework of a biographical approach, which are unavailable from other sources such as contemporaneous texts and typological studies.

²¹¹ Matthews 2011.

²¹² *Ibid.*

²¹³ Bridgford (2000) employed electron probe microanalysis (EPMA) for composition analysis. It involves taking a small sample from an object.

²¹⁴ Use-wear analyses have been applied on research of stone tools in China, see Zhang Xiaoling et. al 2010; Shen Chen and Chen Chun 2001.

3.2.4.3 Strategy of the analysis

As no metalwork analysis has ever been carried out on Chinese bronze weapons, methods developed in Europe, from identification and documentation to classification of different types and the extent of damage on weapons, have been useful as guidance.²¹⁵ In compliance with health and safety principles for the scientific study of British Museum collections, I have developed the following steps to carry out the metalwork wear analysis of Shang weapons *in situ*:

- Cataloguing the Shang weaponry collection (see Appendix 1). All weapons are measured, weighed, photographed and described. Objects that are incomplete, heavily corroded or have received inappropriate conservation treatment (e.g.: invasive cleaning) are excluded. 12 weapons have been selected for the metalwork wear analysis. They are marked with an asterisk * in the Catalogue.
- Macro observation: all weapons are examined individually using the naked eye under an adjustable light source. Any wear marks are described and photographed. A Nikon DSLR (D5500) and Panasonic (DMC-LX7) digital camera will be used to take photographs.
- Micro observations: objects are examined under a digital microscope mounted on a stand in connection with a laptop. The device employed is a Dino-Lite Pro AM4115TW (1.3 Megapixels, x10~x50 magnification and white LED lights) from the Research Laboratory for Archaeology and the History of Art, University of Oxford. Images are captured using the software DinoCapture 2.0 with detailed information, such as scales and magnifying power. The device has been calibrated at the start of the analysis.

²¹⁵ Bridgford 2007; Bruno 2012; Roberts and Ottaway 2003.

3.4 Summary

Through a review of previous weaponry studies and the research questions posed in this thesis, this chapter has outlined the theoretical framework and strategies adopted in order to explore dynamics of weapons' lives in a holistic way. A review of previous applications of biographical approach and their critiques have been useful in shaping the theoretical framework of this thesis. The strategy I take is to have specific research questions clearly outlined and using the study of weapons' biography to understand the ways in which materials interact with humans, and the Shang society. I argue that an object biographical approach has showcased its potential as a framework together statistical tools to untangle any associated preconceptions of objects and bring all information together from their production, patterns of use and contexts of deposition. This stage by stage review will help us to deconstruct value embedded with weapons and then reconstruct it in order to build a holistic view of Shang weapons, their interactions with people and their roles in society.

Chapter 4 Sources of data and its selection

The primary materials for the current study are from archaeological excavations and surveys, mainly drawn from published reports of Shang sites. This will be supported by previous research on contemporaneous texts (oracle bones and bronzes). I will also study Shang bronze weapons in the British Museum collection. These all have potential issues and I will discuss their nature and significance in relation to the thesis in the following sections, as well as principles employed for collecting data. In particular, metric data and contextual information (including spatial distribution of objects in tombs) have rarely been explored in the research of weapons, but provide essential evidence on weapons' lives.

4.1 The accumulation of archaeological data

Archaeology offers the most comprehensive body of information on Shang weapons. The archaeological data does not just comprise excavated weapons of various types and materials, but also contexts, including chronology, types of depositions (e.g. tombs, sacrificial pits, hoards or settlements), conditions of finds (e.g. complete, partially complete or fragmentary), and relationships with other objects (e.g. the ratios between bronze and jade weapons, and between bronze vessels and weapons). In the following sections, I will discuss the nature of archaeology, its practice in China and the authorship of archaeological reports in relation to their impact on the data available for this research.

4.1.1 Nature of archaeological data

The nature of archaeology as a subject has determined the information it provides. As archaeologists, we always work with fragments and glimpses from past societies. It is thus

important to acknowledge the limitations and restrictions we face. The survival and recovery of sites and objects are subject to a number of factors.

In general, nature plays an important role in the preservation and destruction of the archaeological record. On many Shang sites, water levels have had an impact. For example, at the time of discovery, the tomb of Fuhao was flooded, meaning that it was not possible to reconstruct the spatial arrangements of the objects within, and the skeleton did not survive for further examination.²¹⁶ The acidity level of soils also has an effect in accelerating the decaying process of organic materials. Rarely are there survivals of wooden shafts for bronze weapons; most only have the metal parts remaining.

For research into Shang weapons, there is an imbalance of data available from different periods and sites due to human factors, such as construction, agricultural processes and tomb robbery. Zhengzhou site has been considered to have been a capital of the early Shang due to its size, the remains of inner and outer walls, large foundations (known as the palace and temple complex) and workshops.²¹⁷ Yet, the site is situated directly under the modern city of Zhengzhou. Although many excavations have been carried out in response to modern construction, knowledge of the site is extremely fragmentary. To date, no cemeteries or large tombs with quantities of goods have been located, only tombs furnished with small numbers of bronzes have been uncovered, in sporadic locations and many having been looted.²¹⁸ The middle Shang period was only widely recognised when the Huanbei site was excavated in the

²¹⁶ Zhongguo shehui kexueyuan kaogu yanjiusuo 1980.

²¹⁷ Henansheng wenwu kaogu yanjiusuo 2001.

²¹⁸ *Ibid.*

late 1990s.²¹⁹ Although the Taixi, Sanjiazhuang and Huanbei sites of the period have been identified, no systematic excavations have yet taken place and our understanding of the middle Shang is correspondingly limited. In contrast, extremely rich material remains have been revealed at the Anyang site of the late Shang after nearly a century's systematic excavation (see Chapter 4.1.3).²²⁰ Considering that the majority of Shang weapons are predominantly from Anyang of the late Shang, care needs to be taken when studying patterns of development of weapon types and depositions from the early to the late Shang. I will discuss this further in Chapter 4.1.4.

4.1.2 Archaeological practice in China

There are several characteristics regarding the practice of archaeology in China and they all have an impact on the data available and its interpretation. First of all, most of the archaeological work being carried out in China is in the form of rescue excavations in advance of economic development; archaeological discoveries have therefore been haphazard and excavation reactive rather than research-led.

Secondly, one notable aspect of Chinese archaeology is its historiographic tradition.²²¹ Historiography is characterised by the following features: power focused (mostly concerned with elites), universal rules, official interpretations, data compilation, chronology and nationalism.²²² Under such influence of historiography, archaeology has become a sub-

²¹⁹ He Yuling and Yue Hongbin 2011.

²²⁰ Zhongguo shehui kexueyuan kaogu yanjiusuo 1994.

²²¹ This is not unique to Chinese archaeology, but also other parts of world, such as Greek archaeology and Egyptology.

²²² Chang Kwang-chih 1980; Falkenhausen 1993; Liu Li and Chen Xingcan 2012.

subject of history and all archaeological data has been connected directly with names and places mentioned in transmitted texts.²²³ The supposed continuity of the Chinese nation and culture has been inferred directly when interpreting archaeological data. It is no surprise the operation of archaeological fieldwork in China is problematic. For example, the Yellow River Valley, particularly the Central Plains area, has been traditionally associated with the legendary Huangdi (Yellow Emperor) 黃帝 and the Xia 夏 and Shang dynasties in historical texts. The priority for archaeological work in the area has always been the pursuit of information to support the transmitted texts and to glorify the core Chinese civilisation.²²⁴ Regarding Shang archaeology, the Anyang site, considered to be the last capital of the late Shang, is the only site that has received on-going, systematic excavations for nearly a century. When other Shang sites have been identified, most of the work has taken the form of salvage excavations in competition with the demands of modern construction, and tomb robbery. As the tradition of official compilations of historical records is mostly concerned with rulers and elites, archaeology has been very much focused on identifying large foundations (often problematically interpreted as palatial-temple complexes), walls, and tombs and their burials goods. This has a direct impact to the archaeological data that is available and also research carried out. In the case of Shang weapons, the majority came from burial assemblages, while some were recovered from the contexts of workshops, sacrificial pits, hoards, and building foundations. This partially results from tomb/treasure-oriented practices in Chinese archaeology, but it also reflects a general trend- the significance of burials to the Shang, as

²²³ In more recent years, archaeology in China has increasingly become a more independent subject. For example, archaeology departments in several universities were separated from the history departments. Yet, it is still a long journey for the Chinese archaeology to break away from the framework of history.

²²⁴ Falkenhausen 1993.

discussed in Chapter 3.2. It has only been in more recent years that attention has shifted to wider aspects. For example, a few systematic regional/settlement surveys on Shang sites have been carried out. Although mostly in the area of the Central Plains, new practices have been gradually applied in China, e.g. a regional survey in the Huan 洹 river region between 1997 and 1998 and a settlement pattern survey in the region of the Yi 伊 and Luo 洛 rivers from 1998 to 2000.²²⁵

Political orientation has also led to a nationalistic approach to Chinese archaeology and a desire to prove a linear development from earlier dynasties to the present day. One example is the Xia, Shang and Zhou Chronology Project (hereafter ‘the Project’) that took place between 1996 and 2000.²²⁶ A multidisciplinary team of over 200 experts was formed to combine archaeological, historical, radiocarbon dating and astronomical methods to establish absolute dates for early China. As the Project was initiated and commissioned by the Chinese government, it has been seen as a new wave of nationalism in China in response to contemporary politics.²²⁷ Further, despite diverse and complicated pictures being uncovered by recent archaeological work, the subject still serves as a tool of historiography to support the linear development of Chinese culture as seen from historical records.²²⁸

From the 1980s, a new framework has become particularly influential in interpreting the diverse material remains of various regions in China, as opposed to the historiographic

²²⁵ Regional survey at Huan river region, see Sino-American Huan river valley archaeology team 1998; settlement pattern survey in the region of Yi and Luo rivers, see Cheng Xingcan et al. 2003.

²²⁶ Xiashangzhou duandai gongcheng zhuanjiazu 2000. For an introduction to the Project in English, see Li Xueqin 2002.

²²⁷ Lee Yun Kuen 2002.

²²⁸ *Ibid.*

perspective that the Central Plains was the only cradle of Chinese civilisation. It was known as *quyu xitong* (regional system) and was formalised by Su Bingqi 蘇秉琦, former director of the Institute of Archaeology, Chinese Academy of Social Sciences. He argued that the formation of Chinese civilisation resulted from regional interactions, as evidenced by the sharing of certain material remains. Archaeologists working in provinces followed this approach closely and *bendi teshe* 本地特色 (local characteristics) has become a popular and conventional term in excavation reports to describe characteristics of artefacts in comparison to those found in the Central Plains. Surprisingly, however, comparisons are rarely carried out between artefacts from two regions that are close geographically in comparison to the Central Plains. Furthermore, a ‘regional paradigm’ has become apparent in provincial archaeological practice.²²⁹ In China, the majority of current archaeological work is carried out by local archaeological institutes (city/province-level).²³⁰ This leads to a situation that local archaeologists are confined to working in modern administrative boundaries and have limited knowledge or access to fieldwork in neighbouring provinces. As ancient material remains do not correspond to current political borders, this has seriously undermined our understanding of regions as a whole. Examples of the problems caused include two different names being given to the same group of material remains, as the site spread across two provinces, such as the site known as Qingliangang 青蓮崗 in Jiangsu province and Dawenkou 大汶口 in Shandong.²³¹

²²⁹ Falkenhausen 1995, 202-215.

²³⁰ On the organisation of archaeological units and their administrations, see Falkenhausen 1995; Thorp 2007.

²³¹ Falkenhausen 1995, 203.

4.1.3 Archaeological reports

While acknowledging the impact of archaeology as a subject and its practices in China, it is also important to recognise that archaeological data is partial and subjective. In China, many excavations are published in the form of brief reports in journals, such as *Kaogu* (Archaeology) 考古 and *Wenwu* (Antiquities) 文物. For some major discoveries, archaeological reports have been expanded to books and published in greater detail with drawings and images, such as the monograph dedicated to the tomb of Fuhao, late Shang, Anyang.²³² Reports follow a consistent format, starting from a brief introduction on the geographical setting and history of the site, stratigraphy, key features and then finds by materials and categories.

In this thesis, the majority of data is drawn from published reports,²³³ but what appears in reports is not the raw data from the soil. Although the aim of archaeological reports is to record archaeological finds and contexts, at the same time archaeologists have applied their own methodological, theoretical and interpretational biases when writing the reports. On object terminology and classification in reports, as detailed in Chapter 2.2.1, similar objects might have been given different names or assigned to different categories.

²³² In China, excavation reports are often credited to the archaeological units, local archaeological teams or a branch of the Archaeology Institute of the Zhongguo shehui kexueyuan 中國社會科學院 (China Social Science Academy), reflecting the efforts of teamwork in the compilation of the reports. However, the input of individuals has been generally overlooked. The only exceptions are reports published by excavators from Academia Sinica between 1928 and 1936, who moved to Taiwan after the civil war (1945-1949), e.g. Liang Siyong and Gao Quxun 1980; Shi Zhangru 1980.

²³³ Some of the data in this thesis came from first-hand observations on bronze weapons from the British Museum collection, which will be discussed further in Chapters 5.4 and 6.

As the amount of data is normally vast, only selected remains and artefacts will be mentioned in reports. There is a tendency to choose objects for inclusion based on their material, condition and aesthetic qualities. This artefact-centric approach to reporting archaeology is opposed to a context-centric approach. Objects of bronze and jade are usually the preferred ones in contrast to ‘common’ materials such as stone, ceramic, bone or shell. It is widely practiced that large and richly furnished tombs would be comprehensively described. Those containing no burial goods would often be briefly mentioned. One example is the report on the Guojiazhuang cemetery at Anyang.²³⁴ Chapter 2 of the publication is an overview of the cemetery with four representative tombs illustrated to demonstrate tomb layouts and assemblage distributions, with the remaining 180 tombs only listed in a table in the appendix, whereas Chapter 3 is devoted to a detailed account of M160, the largest complete tomb in the cemetery. With regards to burial goods, items from all tombs (except M160) are arranged by material, category and typology with a small selection presented and described. Despite this reporting style offers an overview of the tombs excavated, it fails to provide information of an individual tomb regarding sizes, locations, goods assemblages, where objects were placed, tomb occupants and associated sacrificial pits.

With regards to the accuracy of data, from numbers of objects to measurements of object sizes, the recorders’ precision and rigor are paramount, as well as that of the editor. Minor errors have been noticed in some reports. For instance, the Fuhao report states there were a total of 134 bronze weapons in the summary, but the total of all weapons listed is 159.²³⁵ In such circumstances, I have drawn upon the item lists rather than the summaries. In some

²³⁴ Zhongguo shehui kexueyuan kaogu yanjiusuo 1998.

²³⁵ The report listed four broad flat axes, 91 dagger-axes, 57 arrowheads, six bow-shaped objects and one terminal, see Zhongguo shehui kexueyuan kaogu yanjiusuo 1980.

cases, such as the depths of tombs, it is unclear whether the given figure refers to the depth of the tomb itself or from the modern ground level to the bottom of the tomb.²³⁶ Unlike the grey literature available in British archaeology, it is not possible to access the data from excavations if they have not been formally published.²³⁷ Some might be referenced in conference papers or degree theses;²³⁸ some were delayed for many years due to job changes or illness of key staff; while some were briefly mentioned in overview books of the site.²³⁹

Of particular relevance to this thesis is the availability of metric and weight data of weapons. There seems to be a presence/absence of data depending on the size of tombs. Taking the example of the Guojiazhuang cemetery report, sizes and weights are provided for all of M160's bronze weapons, yet only lengths are provided for representative weapons from the small tombs mentioned in Chapter 2 of the report. This bias restricts research on weapons from small tombs in favour of those from large tombs. Similar issues also occur regarding the relative positions of objects in tombs. The locations of all items in M160 are described in detail and accompanied by illustrations of the tomb's layout and the objects within it; but very little is known regarding spatial distributions of objects in the other 183 tombs except for a general statement.²⁴⁰ Furthermore, due to the missing data, questions such as whether or

²³⁶ E.g. Miaobei M105, see Zhongguo shehui kexueyuan kaogu yanjiusuo Anyang gongzuodui 1989.

²³⁷ In archaeological fieldwork stations, researchers may be able to see some unpublished materials in agreement that no photos and notes will be taken.

²³⁸ Tang Jigen, head of the Anyang archaeological team, included a large number of unpublished tombs in his PhD thesis, see Tang Jigen 2004.

²³⁹ For example, a number of tombs were included in *Yinxu Qingtongqi* 殷墟青銅器 (*Bronzes from Anyang*), a comprehensive book regarding late Shang bronzes excavated at the Anyang site, see Anyangshi wenwu gongzuodui and Anyangshi bowuguan 1993.

²⁴⁰ Zhongguo shehui kexueyuan kaogu yanjiusuo 1998, 9.

not there are differences between bronze weapons in tombs of various sizes are impossible to address.

4.1.4 Data selection and management

There is a general trend of increasing weaponry in terms of quantity, quality and variety in tombs from the early to the late Shang.²⁴¹ However, to date, around 1,000 early and middle Shang tombs (including both intact and incomplete ones) have been published; in contrast, there were over 2,000 published tombs from the Anyang site of late Shang.²⁴² The lack of an even distribution of data available across time periods means that discussing chronological change would place too much emphasis on later time periods – only when there are more early and middle Shang tombs can such an analysis be done. In addition, the three largest complete Shang tombs with the richest grave goods (Fuhao's tomb, Guojiazhuang M160 and Huayuanzhuang M54), were all found at Anyang, dating to the late Shang. Therefore, this thesis will focus on the late Shang at Anyang, which has yielded the most comprehensive dataset.

To conduct statistical analyses in archaeology, we need to collect as much data as possible, while also acknowledging the fragmentary nature of the archaeological evidence. Regarding the sample size required for a correlation test, there is no compulsory minimum requirement.

²⁴¹ Guo Yanli 2014. This has generally been attributed to developments in the bronze industry and advancements in weapon lethality and combat practice. It has also been interpreted from the perspective of state formation processes (Underhill 2006). Meanwhile, burial assemblages became richer in general from the Neolithic to the late Shang (Campbell 2007). Other factors, e.g. changes in beliefs, mortuary practice (what was desirable to be included in burial assemblages), and the survival of certain materials, could also account for the increase. One possibility is that there might have been quantities of weapons made from wood or other organic materials. They would have left little trace due to deterioration. In addition, as their materials are commonly available, they may not have been chosen for inclusion in tombs, but discarded when broken or no longer of use.

²⁴² Gao Xiangping 2011, 12.

Formally, a sample size of 5 is considered to be small, and 50 is large.²⁴³ With a very small sample size, the result might be skewed and it is then important to be more critical with its interpretation. The larger the sample size of a given population, the more reliable the result. Based on previous studies of the late Shang society organisation and questions to be investigated in this research, databases of 121 elite burials and the Guojiazhuang lineage cemetery (n=91) are compiled. The data has been extracted from the original archaeological reports and entered into a Microsoft Excel spreadsheet (see Appendix 3 Anyang tomb databases). Both datasets are sufficient for statistical interrogations. The following section provides a detailed account on how they were selected and organised.

Previous research has revealed that the late Shang was a lineage-organised society.²⁴⁴ Tang Jigen's thesis identified a number of large units of burials at Anyang as lineage cemeteries using evidence of formation process and spatial distribution of burials, in combination with burial assemblages and pictography of bronze inscriptions.²⁴⁵ He also referenced two settlement sites, Baijiafeng 白家墳 and Liujiazhuang 劉家莊, as lineage-based dwelling sites.²⁴⁶ The late Shang society was also highly stratified as demonstrated by mortuary practice, e.g. tomb sizes, human sacrifices and burial assemblages.²⁴⁷ Notably, numbers of sets of drinking vessels (*gu* 觚 beaker and *jue* 爵 goblet) have been identified as the most key

²⁴³ Fletcher and Lock 2005, 67.

²⁴⁴ Tang Jigen 2004. There are also works based on oracle bone inscriptions on the social organisation of the late Shang, see Ding Shan 1956; Keightley 2012.

²⁴⁵ Tang Jigen 2004.

²⁴⁶ *Ibid.*, 50-151.

²⁴⁷ E.g. Liu Yiman 1995; Tang Jigen 2004; Campbell 2007.

indicator of burial status.²⁴⁸ Thus, in this thesis, tombs interred with one or more sets of bronze drinking vessels were termed ‘elite burials’. Here I use the term burial status rather than tomb occupants’ status to avoid taking mortuary data at face value (Chapter 3.2). For the purpose of statistical tests, only undisturbed and fully published tombs have been considered. A total of 121 tombs meet the criteria with the majority dating to the 2nd to 4th phases (n= 112), two tombs of uncertain dating, and the rest from the 1st phase (n=7). Some of them were buried with weapons of various quantities, materials and types and some had none.²⁴⁹ There are also a few exceptions in the data selection. For example, burials Guozhuangbei M6 and Liujiazhuang M9 both have three sets of bronze drinking vessels, but were excluded from the database for the following reasons. Finds of Guozhuangbei M6 were only briefly mentioned in research volumes and a full report has never been published; Liujiazhuang M9 is a unique case with two occupants (a male and a female), while all other tombs have single occupants. On the question whether this database is representative or not, previous research indicates that of over 10,000 excavated burials at Anyang, approximately 7-10% belong to the elites.²⁵⁰ Although those 121 tombs are a small percentage of all elite tombs excavated (c.10%), they are the only complete examples that represent elite cultures of the late Shang at Anyang.

²⁴⁸ Zhang Changshou 1979; Zheng Zhengxiang and Chen Zhida 1985; Yang Xizhang and Yang Baocheng 1985; Liu Yiman 1995; Tang Jigen 2004; Hu Jinzhu 2010. Though there are other indicators, such as grave form (with ramps), tomb sizes (over 4m²) (Hu Jinzhu 2010), sets of drinking vessels were ‘the most important indicator of social position’ (Tang Jigen 2004, 130).

²⁴⁹ Here, we operate on the assumption that in elite burials wealth is not a factor in the absence or inclusion of weapons.

²⁵⁰ Tang Jigen 2004, 146. Based on evidence of formation process and spatial distribution of burials, in combing with burial assemblages and pictography of bronze inscriptions, Tang’s research discussed social organisation of the late Shang society from a mortuary perspective.

Using the same criteria of drinking vessel sets set above, tombs without any sets have been termed ‘non-elite burials’ in this thesis. They normally contained a few items, such as ceramics, bronze tools and weapons, and cowries. They were the large majority that forms the lineage groups.²⁵¹ Instead of analysing all non-elite burials of different loci at Anyang, I believe examining a lineage cemetery might be more beneficial, as the lineage groups were the basic units that constitute Shang society as evidenced from texts and archaeological data.²⁵² Although 16 burial areas have been excavated at Anyang, no lineage-cemeteries have been completely investigated. Burials areas, such as Meiyuanzhuang 梅園莊, represent zones excavated in modern times and could contain elements of several cemeteries or one partial cemetery.²⁵³ Additionally, some of them have suffered from severe looting and others have not yet been published.²⁵⁴ Base on the surviving condition and the quality of publication, the Guojiazhuang cemetery offers the largest dataset of complete tombs among all lineage cemeteries, and thus it has been selected for my study. In this cemetery, 191 tombs and pits have been excavated and dated to the 2nd to 4th phases of the late Shang. Among them, 91 were uninterrupted and these have formed the database for the Guojiazhuang cemetery (see Appendix 3 Guojiazhuang lineage).²⁵⁵ It is necessary to note that there is overlap between the 121 elite tomb database and the Guojiazhuang lineage database. Ten tombs (e.g. M160) from the Guojiazhuang lineage cemetery also fit the criteria for being elite tombs as set out above.

²⁵¹ Tang Jigen 2004.

²⁵² Ding Shan 1956; Tang Jigen 2004.

²⁵³ Tang Jigen 2004, 48.

²⁵⁴ *Ibid*, 48-53.

²⁵⁵ Zhongguo shehui kexueyuan kaogu yanjiusuo 1998.

For the purpose of statistical analyses, the nature of various tomb features and burial goods need to be taken into account to determine whether it is necessary to include them and how they should be represented in the dataset. Jade weapons with bronze handles have been grouped into the jade weapon category, as they are as delicate as jade examples and possibly shared similar functions. The quantities of cowries and clams have been excluded from the total because they only appeared in large numbers in a few tombs. For example, only 30 elite tombs had cowries, but Xiaotun M5 and Huayuanzhuang M54 each had 6883 and 1472 pieces respectively, with the other 28 having 144 in total. Among Guojiazhuang lineage tombs, M34 had 280 clams while most others had only two.

The general absence of cowries seems to contradict an argument putting forward by Kondo Takaichi 近藤喬一 on their function. He suggested that cowries represent awards for military achievement, but I question his argument.²⁵⁶ His evidence came from large quantities of cowries found in Xibeigang M1001 (possibly a Shang king's tomb), Fuhao's tomb, and the Hougang round pit. He argued that the victims in the Hougang pit were Shang soldiers and the cowries were their rewards. However, the skeletal analysis suggested that several of the victims were children and elders, making this interpretation unlikely. Judging by the rest of the finds assemblage, bronzes (vessels, tools and weapons), ceramics, jade and bone ornaments, ivory, and grains, the cowries are more likely to be part of the offerings.²⁵⁷ As seen from Appendix 3, with the exception of M5 and M54, other elite tombs have either few cowries or none at all. For example, M160 has no cowries but contains large numbers of weapons. Nevertheless, the exclusion of cowries in this analysis does not mean that cowries

²⁵⁶ Kondo Takaichi 1998.

²⁵⁷ Tang Jigen 2004.

in tombs have no connection to weapons or warfare. One possibility is that, considering the long distance between Anyang and the coast, some cowries may have been obtained by the Shang through war or tributes. There are also bronze inscriptions recording Shang kings awarded cowries to his subordinate.²⁵⁸ This suggests that cowries certainly possessed value, though exactly what is unclear on current evidence.²⁵⁹ Hence, for the purposes of statistical analysis, cowries are excluded from the total numbers of items in tombs.

Another consideration is how certain types of weapons may be counted. Arrowheads have often been counted as individual items in the total number of goods. However, they are consumable in use and it is also almost impossible to retrieve them after shooting. An archer is likely to have had large numbers of arrows at his disposal compared to an infantry soldier who could only hold one dagger-axe in one hand in combat. Counting one arrowhead as equal to one dagger-axe or spearhead will therefore certainly unbalance the overall numbers of weapons in tombs and the subsequent statistics. Bunches of ten arrowheads have been recovered on many occasions. One example is the ten bone and ten bronze arrowheads recovered within their quivers in the chariot pit YM20 at Xiaotun.²⁶⁰ Groups of ten arrowheads were also found in Fuhao's tomb and 04 Dasikong M303.²⁶¹ It is likely that arrowheads were held in a quiver in groups of ten or less. Ten bronze or bone arrowheads is therefore counted as one weapon for this study. Jade arrowheads have been entered as single items, as they were individually made and their sizes and delicacy suggest they were not

²⁵⁸ Campbell 2007, 99.

²⁵⁹ For a critical review of cowries as money in early China, see Li Yung-ti 2003.

²⁶⁰ Details of YM20, see Shi Zhangru 1950; Fuhao tomb, see Zhongguo shehui kexueyuan kaogu yanjiusuo 1980; 04 Dasikong M303, see Yue Hongbin, Yue Zhanwei and He Yuling 2008.

²⁶¹ Report of Fuhao tomb, see Zhongguo shehui kexueyuan kaogu yanjiusuo 1980; report of M303, see Zhongguo shehui kexueyuan kaogu yanjiusuo Anyang gongzuodui 2008.

employed in actual combat.²⁶² In contrast, bronze arrowheads were cast in batches using clay moulds and bone arrowheads could be produced by hand efficiently and using a more readily available material. Regarding weaponry ornaments, though they are often listed individually in archaeological reports, they are supplementary parts of weapons. For instance, terminals are for the wooden shafts of bronze dagger-axes or spears (see Figure 2.8). Thus, they are excluded for the purposes of this statistical analysis. Finally, some weapons have been mis-categorised as tools in some reports, such as curved-spine knives in the Fuhao tomb report. I have included them in the bronze weapon section of the spreadsheet.

4.2 Contemporaneous texts- inscribed oracle bones

Oracle bones with inscriptions were first found at Anyang and represented the earliest writing system found in East Asia.²⁶³ The inscriptions themselves are divination records of the late Shang. Bones used for divinations were usually shoulder blades of cattle and turtle shells, which were prepared and hollowed. When heat was applied, cracks would appear on the blades or shells, which would then be interpreted accordingly. Finally, the divination act, including the verification, was sometimes recorded on the bone or shell used. Records of warfare and military affairs were one of the major themes in contemporaneous texts of the late Shang, known as oracle bone inscriptions.²⁶⁴ Among the 22,970 Wuding 武丁 (ruled late

²⁶² Zhongguo shehui kexueyuan kaogu yanjiusuo 1994.

²⁶³ Evidence of using animal bones for divination has been seen in many Neolithic sites. For an overview and discussion of the practice, see Flad 2008.

²⁶⁴ Oracle bone inscriptions are divination records of the late Shang. For details on their nature, see Chapter 5.2. Keightley (1997, 30-41) listed 17 topics that appear in the records of divinations. They include sacrifices and rituals, mobilisations, military campaigns, meteorological and celestial phenomena, agriculture, sickness, childbirth, disasters/distress/trouble, dreams, settlement building, orders, tribute payments, divine assistance/approval, requests to ancestral or natural powers, the night or the day, hunting expeditions, and the ten-day week.

13th century B.C.) period oracle bone fragments published in the collection of *Jiaguwen Heji* 甲骨文合集 (*Complete Works of Oracle Bone Inscriptions*), one tenth of the divination records were categorised in the subject of warfare and military.²⁶⁵ Other major works published in more recent years include many more war-related inscriptions.²⁶⁶

A typical record of a war as recorded on oracle bones may include the following aspects:

- Divination on the most auspicious time of attack;
- Whether the leader of the army is blessed by ancestors or spirits;
- Divination on victory or defeat on the current day;
- Prayers for protection from the ancestors and for a safe return.

One example is:

甲辰卜爭貞：我伐馬方帝受我又。一月。(Jiaguwenheji 6664)

‘Crack-making on *jiachen* (day 41), Zheng divined: if we launch a campaign again the Mafang, Di will confer assistance on us. First Month.’²⁶⁷

²⁶⁵ Guo Moruo 1978-1982.

²⁶⁶ E.g. *Jiaguwen Heji Bubian* 甲骨文合集補編 (*Supplement to Complete Works of Oracle Bone Inscriptions*), see Peng Bangjiong et al. 1999; *Yingguo Suocang Jiaguj* 英國所藏甲骨集 (*Oracle Bone Collection in Britain*), see Li Xueqin et al. 1985; *Xiaotun Nandi Jiagu* 小屯南地甲骨 (*Oracle Bone from Xiaotun South*), see Zhongguo shehui kexueyuan kaogu yanjiusuo 1980-1983; *Yinxu Huayuanzhuang Dongdi Jiagu* 殷墟花園莊東地甲骨 (*Oracle Bones from Anyang Huayuanzhuang East*), see Zhongguo shehui kexueyuan kaogu yanjiusuo 2003. The latter two works were catalogues of oracle bone hoards excavated at Anyang. Useful dictionaries include *Jiagu Wenzi Jishi* 甲骨文字集釋 (*Complied Interpretations of Oracle Bone Characters*), see Li Xiaoding 1991; *Jiaguwen Zidian* 甲骨文字典 (*Dictionary of Oracle Bone Characters*), see Xu Zhongshu 1989; *Jiagu Wenzi Gulin* 甲骨文字鈎林 (*Collection of Oracle Bone Characters*), see Yu Xingwu 1996.

²⁶⁷ *Ibid*, 177.

The current most informative work on warfare of the late Shang is *Shangdai Zhanzheng yu Junzhi* 商代戰爭與軍制 (Wars and Military System in the Shang Dynasty) by Luo Kun 羅琨.²⁶⁸ While some evidence came from transmitted texts, Luo's Shang military history is based primarily on oracle bone inscriptions. Wars against different groups were narrated in the sequence of the late Shang kings, and two chapters were devoted to military divisions and equipment using both textual and archaeological evidence. Scholars have also contributed to particular aspects of warfare. In Campbell's study on violence in the late Shang, his interest focused on the nature of warfare and its role in the socio-political landscape. He considered that 'war in the Shang was thus not simply diplomacy by other means but a set of fundamental practices of authority feeding the sacrificial economy and maintain[ing] the king's world order in a turbulent and dangerous spiritual and political landscape'.²⁶⁹ Keightley's recent research monograph provides insights into the mobilisation of human resources for warfare and highlights the significance of the kings' capacity to call upon officers and allies, and raise forces, which were fundamental to the Shang's military and political hegemony among others.²⁷⁰

One thing to note here is Thorp's observation on the different meaning of 'divination' in Chinese and English.²⁷¹ Shang divination appears to be composed of dialogues with ancestors in rather plain languages, who indicated their desires/opinions through the cracks, which

²⁶⁸ Luo Kun 2010.

²⁶⁹ Campbell 2007, 197.

²⁷⁰ Keightley 2012.

²⁷¹ Thorp 2006, 172-173.

could only be interpreted by particular individuals.²⁷² In contrast, divination in English indicates foretelling the unknown, e.g. a future event, and many appeared in the form of riddles in the Classical world.

Oracle bone inscriptions are unique sources to study the period, as they were composed contemporarily and many of the inscribed objects were archaeologically excavated. However, using the inscriptions as a historical source has its limitations. Currently, rubbings of over 46,000 Shang oracle bone inscriptions have been published, but they represent less than a quarter of the 200,000 oracle bones known.²⁷³ Keightley suggested that this is in itself only a small proportion of the actual quantity of oracle bones produced during the late Shang.²⁷⁴ Among the inscriptions studied, the majority date to the reign of King Wuding and considerably fewer oracle bones were from the post-Wuding time of the late Shang. The subjects of the enquiries are broad, including weather, conquest and hunting to harvest, birth and many others, and they generally represent the concerns of the societal elites.²⁷⁵ The evidence is fragmentary and abstract, even on the subject of religion.²⁷⁶ Of particular relevant

²⁷² Diviners were first recognised by Dong Zuobin (1931) in his study of excavated oracle bone inscriptions at the Xiaotun locus. In 1933, Dong proposed the concept of ‘diviner groups’, which later became a standard for dating inscriptions. Rao Zongyi (1959) identified about 142 individual diviners in his study of oracle bone collections in many countries. In a recent excavation of a lineage cemetery at Wangyukoucun Nandi 王裕口村南地, He Yuling (2013) proposed that the occupants of two tombs (M103 and M94) were diviners based on evidence of burial assemblages, in particular bronze inscriptions.

²⁷³ Keightley 1990.

²⁷⁴ *Ibid.*

²⁷⁵ Keightley (1997, 30-41) listed 17 topics that appear in the records of divinations. They include sacrifices and rituals, mobilisations, military campaigns, meteorological and celestial phenomena, agriculture, sickness, childbirth, disasters/distress/trouble, dreams, settlement building, orders, tribute payments, divine assistance/approval, requests to ancestral or nature powers, the night or the day, hunting expeditions, and the ten-day week.

²⁷⁶ Keightley 1983, 523-564.

to this thesis, the inscriptions were not intended to be documentation of wars and its related affairs.

Nevertheless, oracle bone inscriptions do reveal certain aspects of Shang society, especially ‘numerous insights into the experiences and priorities of the Shang kings’ as Keightley has discussed in several of his works.²⁷⁷ In particular, many records reveal sketches of various aspects of warfare, such as opponents, preparations, ritual activities, actions and results, which are not available through other sources. So far no Shang battlefields have been uncovered and there is little evidence of designated military loci, except the walls of early Shang sites (e.g. Zhengzhou, Yanshi and Panlongcheng) which are often problematically interpreted as fortifications.²⁷⁸

Thus, using oracle bone inscriptions as evidence is double-edged and limited to some extent. In addition, the meanings of many texts are arbitrary and their interpretations and translations can be highly subjective. As my own training is in the subject of archaeology, rather than palaeography, I will quote original oracle bone texts when possible and employ conventional interpretations with critiques.

²⁷⁷ Keightley 2000, viii; 1978, 137. For a discussion of oracle bone inscriptions as historical sources, see Keightley 1978, 1990, 2000.

²⁷⁸ Underhill 2006.

4.3 Contemporaneous texts- inscribed bronzes²⁷⁹

Bronze inscriptions of the Zhou are known for their long length and rich contents. By comparison, inscriptions on Shang bronzes are rather brief and many only contain a single character and rarely two, three or four.²⁸⁰ They appear on a wide range of objects, including vessels, tools, music instruments and weapons. On the content of bronze inscriptions, they can be generally divided into five types:²⁸¹

- *Zushimingwen* 族氏銘文 (lineage insignia)²⁸²
- Official positions
- Individual names
- Composites (e.g. clan insignia + individual name, position + clan insignia, clan insignia a + clan insignia b);
- Others/unknown.

²⁷⁹ The most comprehensive and up-to-date reference books for inscribed bronzes in Chinese are: *Zhongguo Qingtongqi Quanji* 中國青銅器全集 (*The Complete Collection of Chinese Bronzes*), see Zhongguo qingtongqi quanji bianji weiyuanhui 1996-1998; *Yin Zhou Jinwen Jicheng* 殷周金文集成 (*Collections of Shang and Zhou Bronze Inscriptions*), see Zhongguo shehui kexueyuan kaogu yanjiusuo 1984-1994; *Jinchu Yin Zhou Jinwen Jilu* 近出殷周金文集成 (*Collections of Shang and Zhou Bronze Inscriptions from Recent Excavations*), see Liu Yu and Lu Yan 2002; *Jinchu Yin Zhou Jinwen Jilu Erbian* 近出殷周金文集成二編 (*The Second Addition of Collections of Shang and Zhou Bronze Inscriptions from Recent Excavations*), see Liu Yu and Yan Zhibin 2010. For an English translation of some bronze inscriptions: Dobson 1962; Shaughnessy 1991, 1997, 1999. The two most comprehensive computerised databases of bronze inscriptions are: *Shang Zhou Jinwen Ziliao Tongjian* 商周金文資料通鑑 (*Collection of Shang and Zhou Bronze inscriptions*), see Wu Zhenfeng 2004; Database of Shang and Zhou inscriptions and bronzes 殷周金文暨青銅器資料庫 (free online access <http://www.ihp.sinica.edu.tw/~bronze>) (Copyright 2000-2007 Computing Centre, Academia Sinica).

²⁸⁰ A survey of *Zhongguo Qingtongqi Quanji* 中國青銅器全集 (*Complete Collection of Chinese Bronzes*) shows 265 (48%) Shang bronzes were inscribed, see. Zhongguo qingtongqi quanji bianji weiyuanhui 1996-1998. The number and percentage of bronzes seemed to be quite high. However, this reflects the attention focused on texts in the tradition of Chinese historiography to some extent (see Chapter 5.1.2).

²⁸¹ He Jingcheng 2009; Yan Zhibin 2013.

²⁸² Multiple names have been given by scholars to signs that present lineages. For a review, see Zhang Maorong 2007. In this thesis, I adopt the term *zushimingwen* 族氏銘文 (lineage insignia) proposed by Li Xueqin (1985, 84), as it summarises characteristics of those signs quite accurately.

Although limited in their numbers and contents, inscribed bronzes provide information that is not available from other sources. Particularly, inscribed individual names are quite frequent among weapons. The best-known examples are four broad flat axes in the tomb of Fuhao.²⁸³ The composite forms are also common, such as 36 spearheads and three hooked-head knives in Huayuanzhuang M54, inscribed with ‘*Yachang*’, a combination of position with lineage/individual name.²⁸⁴ This textual evidence will be combined with archaeological data in Chapters 8 for further discussions. In addition, inscriptions are also found on jade, including a number of weapons. I will examine them in detail in Chapter 8.2.1.3.

4.4 The British Museum Chinese bronze weaponry collection

The British Museum holds one of the largest Chinese bronze collections in Europe. By comparison with the bronze vessels, on which numerous scholarly research has been carried out,²⁸⁵ little is known regarding the bronze weapons in the collection, except for images of a few weapons published in catalogues.²⁸⁶ At present, there is no formal catalogue of the collection.²⁸⁷ For example, in the *Ouzhou Suocang Zhongguo Qingtongqi Yizhu* 欧洲所藏中国青铜器遗珠 (*Chinese Bronzes in Europe*),²⁸⁸ a compilation of Chinese bronzes in Europe, the weaponry collection in the British Museum is not included. Thus, an audit of the collection in combination with metalwork wear analysis would be able to provide first-hand

²⁸³ Zhongguo shehui kexueyuan kaogu yanjiusuo 1980, 105-106.

²⁸⁴ Zhongguo shehui kexueyuan kaogu yanjiusuo 2007, 135-139.

²⁸⁵ E.g. Rawson 1987, 1992; Michaelson and Portal 2006.

²⁸⁶ E.g. Rawson 1987, catalogue number 17, 73; Rawson 1992, Figure 27, 55.

²⁸⁷ Except basic information in the British Museum Collection Online https://www.britishmuseum.org/research/collection_online/search.aspx (accessed 11th April 2016)

²⁸⁸ Li Xueqin and Sarah Allan 1995.

information of wear and marks on Shang bronze weapons as well as facilitating future research on the collection.

None of the objects in the collection have archaeological provenances. On the evidence of typology, 12 pieces have been confidently identified and dated to late Shang period by Jessica Rawson and the author. They were donated, purchased or bequeathed to the Museum between the 1880s and 1980s.²⁸⁹ They include the following types: dagger-axes, spearheads, broad flat axes, hooked-head knives, curved-spine knives and arrowheads. Although the collection size is small and the archaeological contexts unknown, all major weapon types of the period are included and most of them are in a good state of preservation. Additionally, the collection's size makes it manageable for conducting metalwork wear observations and documentation in the available time.

4.5 Summary

Archaeology as a discipline in general and its practice in China specifically dictates that the data is partial and fragmentary. While reports are the primary source of archaeological data, they are subjective, variable and selective. There is also an imbalance of the data available among periods, sites and objects. Comparatively speaking, not only is our understanding of the late Shang much more comprehensive than the early and middle Shang, but also larger amounts of material remains have been excavated, in particular weapons. In addition, oracle bone inscriptions (divination records of the late Shang) and bronze inscriptions reveal aspects of the late Shang society that are unavailable through material remains.

²⁸⁹ Jessica Rawson was Deputy Keeper and Keeper of the Department of Oriental Antiquities at the British Museum between 1976 and 1994.

Chapter 5 Metalwork wear analysis of Shang weapons

This study represents the first attempt to apply wear analysis to Chinese weapons, and will test whether the methodology can be applied to unprovenanced items in the British Museum collection. In this chapter, I will develop and define a set of terminology to describe various marks on Shang weapons, e.g. striations, notches, nicks, chips and scratches. Details of observations on individual objects have been included as part of the British Museum Shang Bronze Weapons Catalogue in Appendix 1. They will then be contextualised against the phases of weapon biographies- production process, consumption, treatment before depositions and post-depositional change. By using both macro and micro ways of examining the weapons, I will compare their effectiveness and assess their practicality and advantages respectively.

5.1 Observations

The examination of 12 Shang weapons has been taken place at the British Museum between February to December 2015. They almost exclusively (11 out of 12) display traces of use, polishing or repair on surfaces. In order to consistently describe the characteristics displayed on the examined weapons and reference comparative marks observed on European bronze weapons, the following terms will be used, supported below by illustrations (Table 5.1).²⁹⁰ A number of terms have also been adopted from Untracht's work on modern metal crafting.²⁹¹ Observation results can be categorised into four types: manufacture, use and wear, depositional treatment and post-excavation changes (see Table 5.2). They provide direct

²⁹⁰ Matthews 2011; O'Flaherty et al. 2011.

²⁹¹ Untracht 1968.

evidence of weapons' major life stages (birth, life, death and recovery) to trace their biographies. Those weapons experienced considerable life events before, during and after deposition.

5.1.1 Manufacture

Two types of manufacturing traces have been observed: striations and hafting. Both of them have revealed insights into the birth stage of weapons. Although partially corroded, seven weapons have dense striations on their surfaces. On the blade body, the lines are usually transversal; on the bevel, they are diagonally oriented. One unique example is a curved-spine knife (1945,1017.189) with striations that extend to the decorative goat heads motif on the blade body, which suggest they probably relate to filing or grinding works during the last stage of the production process. One noteworthy remark on those striation marks is some of them are neatly and evenly distributed and others are multi-directional, raising the question of what tools were employed for grinding. I will explore this further in Chapter 7.1.3.

On the methods of hafting, there are two types: tangs (e.g. 1932,1014.20); sockets (e.g. 1915,0409.100). Traces of handles have been observed on the tangs of three dagger-axes (1933,0413.11, 1932,1014.20 and 1953,1215.1). None of the shafts have survived, but mineralised remains of organic material (probably either wood or bamboo) can be observed on surfaces.

In addition, repair or re-polishing work may have taken place to extend the use of some weapons and maintain their effectiveness. Original tool marks may have been removed or masked during this process, but differentiating between primary and secondary tool marks was not possible during this study. Higher powered microscopy in combination with

experimental work might make such differentiation feasible, but this goes beyond the scope of the present research.

The study has reinforced that surface oxidisation may have a profound effect on identifying production traces.²⁹² On a dagger-axe 1915,0409.100, for example, the edge appears blunt beneath a layer of corrosion product. Only a small area of the lower blade (between half way and a third from the tip) reveals sharp cutting edges and striations on both body and bevel (Figure 5.1). Thus, even the seemingly most corroded objects can retain traces and marks, and should not be overlooked.

5.1.2 Use and wear

With the exception of dagger-axe 1948,0716.40, with a blunt blade and one notch, 11 out of 12 weapons display substantial use and wear, including nicks, notches, cracks and scratches, as defined in Table 5.1. They suggest that those weapons were employed for practical purposes during their life stage before they were placed in tombs. The majority of nicks and notches are concentrated on blades, but some are on tips (e.g. dagger-axe 1953,1215.1) and the ends of tangs (e.g. dagger-axe 1880,0802.85). Cracks and scratches are mostly noticed on blade bodies. Due to the small sample size of this study, it was not possible to identify any use patterns on the objects observed. Such patterns might reflect the ways in which a dagger-axe could be wielded for attacking, producing consistent marks on certain parts of the blade. As no experimental archaeology has been carried out on Shang weapons, any interpretation of the causes of damage must remain speculative, and cannot currently be correlated with any activities they might have been engaged with, e.g. cutting through bone or clashing with other

²⁹² Cf. Roberts and Ottaway 2003; Dolfini 2011.s)

bronze weapons or shields. Another factor to consider is blade hardness, which is related to the weapons' chemical composition and post-casting treatment. To explore any relationships between hardness and the extent of impact and damage, further experimental work is required in combination with chemical and metallographic analyses.

5.1.3 Depositional treatment

The surfaces of two dagger-axes (1932,1014.19 and 1936,1118.36) both had large parts covered with traces of mineralised textiles. This has been noted in archaeological reports on many bronze objects, both weapons and vessels, in tombs. One example is burial Qijiazhuangdong M269, Anyang.²⁹³ Five bronze spearheads were neatly stacked in the southwest corner of the wooden chamber, facing south. The arrangement of the objects and fabric traces on the surfaces of the upper and lower spearheads have led to the suggestion that they were wrapped in fabric when deposited in the tomb. The fabric traces observed on two weapons in the British Museum collection may also represent such a practice. They demonstrate another significant event in those weapons' biographies. Such traces are also important evidence that textile wrapping potentially played an important role in burial processes, and are likely to be the only evidence surviving. I will discuss this further in Chapter 8.4. There have also been studies into the types and densities of textile traces, such as the five varieties of textiles identified on bronzes (weapons and vessels) from Fuhao's

²⁹³ Anyangshi wenwu gongzuodui 1991.

tomb.²⁹⁴ Traces observed on the sample objects in the British Museum collection may add new information to our understanding of Shang textiles. More importantly, they informed

5.1.4 Post-excavation changes

Post-excavation changes include any transformation, accidental or deliberate, which have occurred since an object's recovery, such as conservation treatment and deterioration. They have provided evidence regarding the latest events of weapons' biographies. For example, dagger-axe 1932,1014.19 and curved-spine knife 1945,1017.189 received treatment from conservators at the British Museum, which is clearly visible.²⁹⁵ Notably, the conservation record of 1932,1014.19 (VRA 59178) detailed the work carried out and its condition beforehand. The object had several breakages that were reconstructed with lead solder and then were painted in green before becoming part of the museum collection. The conservation process at the British Museum included removing the paint to reveal the repair as well as surviving textile traces. Bronze disease was also treated.²⁹⁶

Post-excavation change also includes damage which has occurred after the recovery of objects. One common way of identifying such marks is through observations of patina in relation to the trace. A dagger-axe (1915,0409.100) (Figure 5.2) and a spearhead (1953,1215.2) show damage (scratch and notch) which has penetrated through corrosion products and must therefore have occurred after the corrosion formed.

²⁹⁴ Zhongguo shehui kexueyuan kaogu yanjiusuo 1980, 18.

²⁹⁵ British Museum Merlin Collection Database (internal); M. Hockey, personal communication 2nd March 2015.

²⁹⁶ British Museum Merlin Collection Database (internal).

Another common post-excavation change is modern modification. Inscriptions on dagger-axe 1948,0716.40 appear to be quite odd (Figure 5.3).²⁹⁷ First of all, there seems to be little overlap between the incised lines and corrosion products. Though parts of incised line had patination, one line seemed to penetrate patination (Figure 5.4). Secondly, the location of the inscriptions, which were on the front half of the tang, was quite unusual. So far all known inscriptions of Shang bronze dagger-axes with archaeological contexts are located on the latter half of the tang. The first half of the tang is normally reserved for binding to the organic shaft. An example to be illustrated here is dagger-axe M54:126 from Huayuanzhuang M54 with the inscription ‘𠄎’ (Figure 5.5). Secondly, the incised lines of the inscriptions look quite artificial.²⁹⁸ A comparison with incised inscriptions of a late Shang *zun* 尊 (drinking vessel) (B60B958) in the Avery Brundage Collection at the Asian Art Museum of San Francisco (Figure 5.6) suggests the lines of dagger-axe 1948,0716.40 are quite shallow and obscure.²⁹⁹ Thus, it is likely dagger-axe 1948,0716.40 was subjected to modern forgery work, probably for higher profit, before they became part of the British Museum collection in 1948. Bronzes with inscriptions were much desirable and highly priced compared to those without any and there was a whole industry in Xi'an in the 1920s and 30s century dedicated to this recreation work.³⁰⁰

²⁹⁷ It is unclear on the interpretation of inscriptions on 1948,0716.40.

²⁹⁸ The large majority of Shang bronze inscriptions were cast. Discussions on the method of casting inscriptions on bronzes, see Bagley 1990, 2009; Lucas 2006.

²⁹⁹ The incised inscriptions were in the foot ring of the vessel. On the interior, there was the same inscriptions but cast. Strahan and Fenn (2007) carried out a study to identify possible carving tools for the incising work. By comparing characteristics observed on the incised lines with experiment results from carving jade and bronze sample plaques using a number of known jade-working abrasive methods, their results suggested that the incised bronze inscription was executed using jade abrasive tools, either wheel-cutting or a riffler, on the basis of close resemblance.

³⁰⁰ Deydier 1995; quoted in Strahan and Fenn 2007, 27.

5.2 Some remarks on the method applied

The above observations have yielded traces and wear that have never been observed on Shang bronzes. Metalwork wear analysis has been approved to be applicable to Shang bronzes. As the first attempt to apply the wear analysis to Shang weapons, there are also lessons learnt in its application.

Observations and recording were carried out at both macro and micro levels. Though both have taken digital photos that can be magnified and analysed later in more detail, they generated slightly different outcomes. For comparisons, Figure 5.7 was taken by a digital camera (Panasonic DMC-LX7) under lamp light; Figure 5.8 was captured by digital microscope Dino-Lite. Both captured a section of the curved-spine knife 1945,1017.189. While Figure 5.7 is a clear photo that catches the colour of the knife surface well, Figure 5.8 reveals the much more details. The glued section and its texture is clearly visible as well as horizontal striations on the right side. This highlights the importance of equipment to carry out the analysis and its recordings. The efficiency of digital microscope is recommended for future work. On the other hand, observations at macro level help to obtain an overview of objects, in particular profile changing of blades. Studies of bronze weapons in Europe have remarked that certain amounts of repair and re-polishing of cutting edges would alter the shape of the blade (e.g. Roberts and Ottaway 2003).

While all marks have been digitally recorded and detailed described, there are limits regarding their interpretations and they can be subjective. For instance, functional wear may not be easily distinguished from post-excavation damage. One useful clue is analysing it in relation to surrounding corrosion products. If the trace penetrates the patination, it is likely to be post-excavation change.

The application of metalwork analysis is quite straightforward, but there is one essential requirement- preservation condition of the objects. Heavy corrosion products on surfaces may mask any surface marks (see Chapter 6.4.3). Another thing to note is original tool marks may have been lost during (extensive) use. New ones might be added as part of the re-sharpening/reworking. In addition, non-provenanced artefacts from museum collections may have undergone additional treatment before they enter a collection. It is then important to select suitable samples before an analysis takes place.

5.3 Discussions

Although all the samples examined in this chapter come from museum collection and do not have archaeological contexts, this pilot implementation of metalwork wear analysis has shed light regarding weapons' production, use-life and depositional treatment that is unavailable from other sources. Observations from metalwork wear analysis, in particularly the employment of digital microscopy, has demonstrated its potential in revealing a range of wear, tear and marks on Shang weapons. Some show none or only little damage before deposition; some have a high frequency of dents; sharp edges with grinding marks are detected on some weapons' surfaces. The combination of these physical traces/marks indicates that weapons with various biographies have been deposited in tombs and other places. Accordingly, ideas that bronze weapons in tombs were either armaments the deceased fought with, equipment for the after-life, or ceremonial implements representing military achievement/rank/authority, seem rather speculative and immersed in historiography and modern concepts. Choices of weaponry in forming assemblages for disposals are most likely to be manifold and resulted from various interactions between humans and weapons during stages of production and use.

Tool marks on surfaces and cutting edges show the majority of them went through sharpening as part of the production process, while a few received little treatment. This suggests slightly different treatments were applied with possibly associated and accumulated value. In the next chapter, I will trace weapons' production procedures, in combination with data from archaeology, metalwork wear analysis and experimental archaeology, to examine the materials, technology and organisation involved to make the objects- the first stage of weapons' biographies.

Chapter 6 Weaponry production

The making of weapons marks the first stage of their biographies. For Shang weapons, bronze and jade are the two major materials that have been uncovered. Both materials were considered to be valuable and precious, as seen from the quality and quantity of products made from them, and their exclusiveness in some tombs. They are also very different materials with distinctive characteristics. This does not just affect technology and craftsmanship employed to produce weapons, but also different value and significance accumulated in the process. Furthermore, material choices and perceptions of objects are inter-linked. Based on existing technological studies of bronze and jade production, I will examine value built during the process of weaponry making and discuss the ways in which the birth stage has an impact on weapons' biographies.

6.1 Bronze weapons

Aspects of bronze productions have been drawing scholarly attention since the start of the 20th century. Research so far can be summarised in the following seven areas with some overlap: bronze vessel casting technology; chemical analysis; development of technology in relation to decoration styles and types of vessels; distribution and diffusion of metallurgy and Shang style bronzes; organisation and management of workshops and workforces; sources of metal and mining; re-casting.³⁰¹ Although our knowledge of Shang metallurgy has advanced to some degree, there are still many gaps in our understanding, such as that the step-by-step process of vessel production remain unclear, and that no systematic study has been made of

³⁰¹ For a review on the study of bronze vessel casting, see Liu Yu 2009.

the origins and innovative development of vessel casting.³⁰² There has been a focus on vessels in bronze research,³⁰³ and weapons are rarely mentioned or discussed in the above studies, despite the quantities of weapons uncovered to date exceeding vessels and other bronzes at Anyang.

Furthermore, there is a lack of bridging techniques of bronze production, use, styles and aesthetics of products, people and societies together to address certain issues. Gosden and Malafouris have recently explored the concept of ‘becoming’ in relation to production processes of objects. Using the example of a vase on a potter’s wheel, they investigated interactions of form (matter) and flow (energy)- the finished products were the results of negotiations between humans and materials, such as the quality of the raw material, available technology, the skills and creativity of the potter, cultural traditions, and desires of the users. All of these elements become embedded in the finished product.³⁰⁴ Therefore, the purpose of this chapter is not just to trace the production of weapons step-by-step, but also to explore, following the biographical framework, the value woven into weapons at their ‘birth’ stage and the impact it may have had on the later stages of weapons’ lives.

As seen from Table 1.2, Shang bronze weapons consist of the following six main types: dagger-axes, spearheads, broad flat axes, hooked-head knives, curved-spine knives, and arrowheads. As this chapter aims to explore the social relationships embedded in weaponry production, rather than being a comprehensive study of the manufacture of various types of weapons, I will use dagger-axes, the most widely distributed weapons of the Shang, as a case

³⁰² Liu Yu 2009; Hwang Ming-chorng 2014.

³⁰³ E.g. Chen Jianli and Liu Yu 2011.

³⁰⁴ Gosden and Malafouris 2015.

study. As our understanding of bronze casting at other sites is limited, discussion is mostly centred on weapon production at Anyang, where a number of bronze workshops have been uncovered. I will first examine the resources needed for casting dagger-axes and their significance. Based on patterns observed on the surfaces of weapons in the British Museum collection in Chapter 6.4.2, I will discuss possible post-casting procedures. Using current technological studies on the manufacture of vessels and archaeological evidence from bronze workshops at Anyang, weapons' production modes and workshop organisations are to be investigated.

6.1.1 Materials

The chemical composition of 91 late Shang bronze weapons from Anyang has been analysed, 54 of which were dagger-axes (see Appendix 4, a compilation of chemical composition data from published reports).³⁰⁵ Chart 7.1 illustrates the ratios of alloy types of all dagger-axes (n=54). The dominant alloy is copper-tin (43%), followed by copper-lead (33%) and then copper-tin-lead (20%) and copper (4%).³⁰⁶ Similar ratios are also observed on chemical analyses of bronze vessels.³⁰⁷ There is enough evidence to indicate that Shang craftspeople had mastered the 'secrets' of different recipes.³⁰⁸ The variety of alloys among weapons implies they might have been products of various needs, which I will explore further in Chapter 8.

³⁰⁵ Zhongguo shehui kexueyuan kaogu yanjiusuo shiyanshi 1982; Zhao Chunyan 2004; Ji Lianqi 1997; Li Minsheng et al. 1984.

³⁰⁶ Here I follow the widely adopted terminology in copper alloys. Copper-tin indicates over 2% tin content; copper-lead indicates over 2% lead content; copper-tin-lead indicates over 2% of both tin and lead.

³⁰⁷ Zhongguo shehui kexueyuan kaogu yanjiusuo shiyanshi 1982; Zhao Chunyan 2004; Ji Lianqi 1997; Li Minsheng et al. 1984.

³⁰⁸ Zhongguo shehui kexueyuan kaogu yanjiusuo shiyanshi 1982; Li Minsheng et al. 1984; Ji Lianqi 1997.

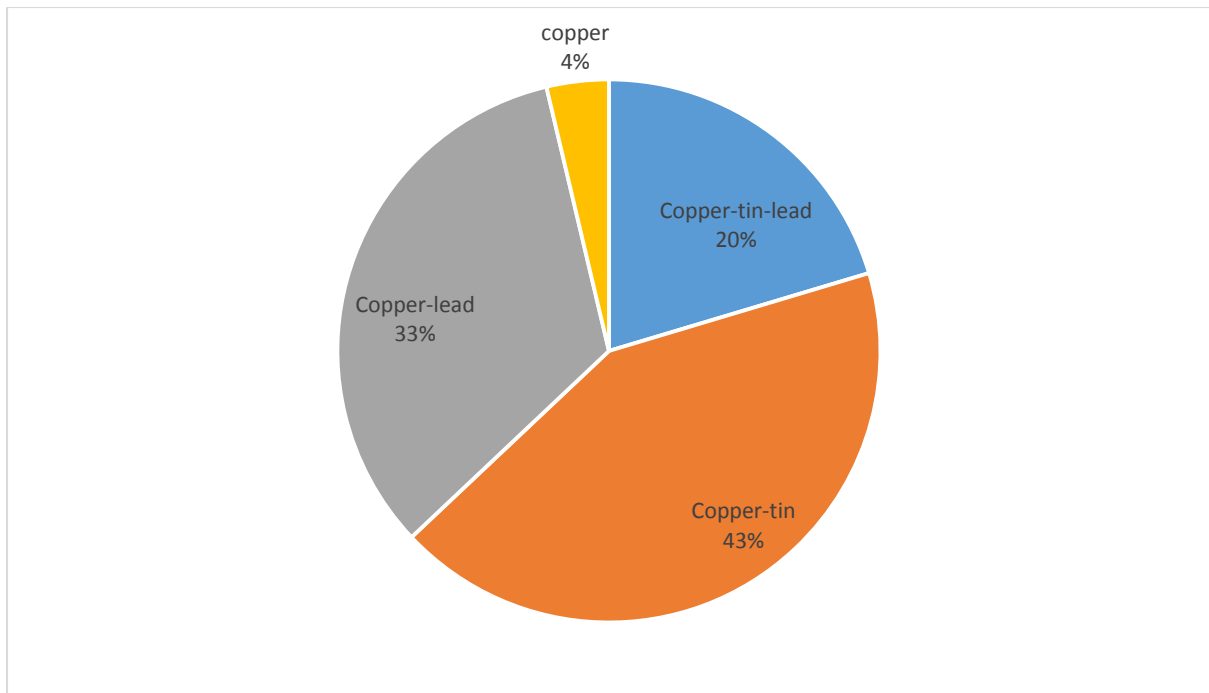


Chart 7.1 Distribution of weaponry alloy types (n=54) (Appendix 4)

The use of copper alloy to produce weapons is not just a technological advancement, e.g. its physical advantages over stone, but also requests the support of a complex network to obtain metal sources. The large quantities of bronze objects recovered so far at Anyang suggests the Shang had access to rich metal resources. The quest for the sources of copper, tin and lead used in the Anyang workshops has generated much scholarly interest. On the evidence of historical texts and remains of ancient mining activities, following sites/areas were proposed: southern Anhui 安徽 province, Tonglūshan 銅綠山 in Hubei province, Tongling 銅嶺 in Jiangxi 江西 province and Zhongtiaoshan 中條山 in Shanxi 山西 province.³⁰⁹ Highly radiogenic lead isotopes ($^{207}\text{Pb}/^{206}\text{Pb} < 0.8$) found in many Anyang bronzes have also led scholars employ lead isotopes for tracing copper sources, as lead and copper naturally co-

³⁰⁹ For southern Anhui, see Yu Yongbin 2015. For Tonglūshan, see Chen Shuxiang et al. 2012. For Tongling, see Liu Shizhong and Lu Benshan 1998. For Zhongtiaoshan, see Tong Weihua 2012.

exist. Based on geographic databases of lead isotope ratios from modern surveys, Jin Zhengyao 金正耀 suggested that southwestern China (borderlands of Yunnan 雲南, Sichuan and Guizhou 貴州 provinces) might be the origin of such highly radiogenic lead as well as copper.³¹⁰ Though no consensus has yet been reached, it is widely acknowledged that the Shang obtained their metal sources outside the Central Plains, possibly from multiple sources. It requires the logistics of long distance transportation and human labour management. In addition, tin and copper do not naturally occur in the same mine, so the Shang would have to obtain them from different places and this adds an extra fold in the operation. The ways in which the Shang acquired the metal, such as through exchange, military conquest, tribute or trade, are debated.³¹¹ One proposition is that the Shang's relationships with other groups varied in nature and extent, depending on the availability of local resources and the Shang's demand.³¹²

Furthermore, the provenance studies are also complicated by how the Shang received metal sources, e.g. in the form of ores, ingots, recycled bronze artefacts, or a combination of these. Evidence of recycling practice has been found in bronze workshops at Anyang.³¹³ This was supported by later historical texts that recorded bronzes captured in battles being used for re-casting.³¹⁴ Due to the recyclability of metals combined with the reality that metals from different sources and of different characteristics could be used together in alloys, an

³¹⁰ Jin Zhengyao 2004. Objects with highly radiogenic lead isotopes are also found in contemporary bronze using cultures, e.g. Sanxingdui (Jin Zhengyao et al. 1995), Xin'gan (Jin Zhengyao et al. 1994).

³¹¹ E.g. Wu Shu-hui 2012, 2014.

³¹² Liu Li and Chen Xingcan 2012.

³¹³ The main evidence is fired clay cores found in workshops, see Li Yung-ti 2003, 114-116.

³¹⁴ Rong Geng 1941.

alternative approach has been initiated by scholars from the Research Laboratory for Archaeology & the History of Art (RLAHA) at the University of Oxford in studies of copper-based objects from Britain, Alpine region, Iran and Mesopotamia.³¹⁵ Based on changing patterns of trace elements in recycling, remelting, and remixing, it shifts the focus from a static view of metal sources to the flow of metal in societies. In 2016, a European Research Council funded project named Flow of Ancient Metal across Eurasia (FLAME) has been initiated by the RLAHA to investigate movement, exchange and transformation of metal in Eurasia.³¹⁶ Those from the Shang will be one of the research foci. Research results of FLAME will shed further light on our knowledge of Shang metalworking practices.

The gathering of raw materials is only the very first step of making bronze weapons, but they are not easily obtained but most likely came from multiple sources e.g. trade, booty from wars, and tributes, which were linked to the Shang's relationship with neighbouring groups. The long distance of transportation would require extensive organisation in terms of logistics and human labour. These would all contribute to the significance and precious value of bronze weapons at the stage of birth and would persistently reminded the users and viewers of any associations in weapons' later trajectories.

6.1.2 Workshop, specialisation and organisation

Bronze workshops were uncovered at both Zhengzhou of the early Shang and Anyang of the late Shang. These discoveries raised interest in workshop specialisation and organisation. For the Zhengzhou site, two bronze workshops, Nanguanwai 南關外 and Zijingshanbei 紫荊山

³¹⁵ Bray and Pollard 2012; Pollard et al. 2015; Perucchetti 2015; Cuenod 2015.

³¹⁶ <http://flame.arch.ox.ac.uk/> (accessed 30th July 2016)

北, have been discovered.³¹⁷ A variety of production related items, such as moulds, tools, crucibles and finished products were found. Among these, the largest group is clay moulds. Many of them were identifiable despite their fragmentary condition. One research interest is regarding if a workshop was specialised in producing one type of bronzes, e.g. vessels. For example, judging by the dominance of tool moulds (40%) found at Nanguanwai workshop (see Table 6.1), excavators suggested that bronze tools were the main products of both workshops.³¹⁸ However, considering that around one third of the moulds were unidentified, this conclusion appears premature. Another issue is multiple pieces could come from the same mould and the total number is unlikely to be inaccurate for such deduction.

Among the four bronze workshops excavated at Anyang, there seemed to be a division of products between them.³¹⁹ At the Xiaomingtun 孝明屯 site, the dominant type of moulds were used for casting tools and weapons (dagger-axes and arrowheads), and a few were for vessels.³²⁰ At Miaopubeidi 苗圃北地, clay vessel moulds were common in contrast to a few dagger-axe and arrowhead ones.³²¹ At Xuejiazhuang 薛家莊, clay moulds for both vessels and weapons were found.³²² In addition to evidence of vessel and weaponry making, moulds of chariot parts were also found at Xiaotuncun Dongbeidi 小屯東北地.³²³

³¹⁷ Henansheng wenwu kaogu yanjiusuo 2001.

³¹⁸ *Ibid*, 346.

³¹⁹ Zhongguo shehui kexueyuan kaogu yanjiusuo 1994.

³²⁰ Zhongguo shehui kexueyuan kaogu yanjiusuo 1994, 2007.

³²¹ Zhongguo shehui kexueyuan kaogu yanjiusuo Anyang gongzuodui 1986; Zhongguo shehui kexueyuan kaogu yanjiusuo 1994.

³²² Zhou Dao and Liu Yadong 1963.

³²³ Shi Zhangru 1947.

Although evidence from Anyang is manifold compared to Zhengzhou, major issues around the bronze workshops were often only lightly touched as part of the excavation reports or overviews.³²⁴ Discussions are rather confined and to some extent speculative due to various reasons, such as only limited areas of workshops being excavated, many are not published, and different approaches being employed in various time periods and among institutions.³²⁵ One particular focus is clay moulds, which has been the main evidence in discussing bronze production technology and workshop management.³²⁶ Meanwhile, craft specialisation in other periods and products in China has been explored from both archaeological and art history perspectives, which have enriched the field in terms of knowledge and theoretical debates.³²⁷ What is particularly relevant for this chapter is investigating how large numbers of weapons were produced, for which I will draw upon evidence from archaeological data and previous research.

In a study of Shang bronze production, Franklin summarised two models of workshop organisation: holistic and prescriptive.³²⁸ Holistic indicates ‘a single, stepwise approximation toward the final object’;³²⁹ prescriptive means ‘specialization by process’.³³⁰ Following Franklin’s work, Li Yung-ti proposed that both holistic and prescriptive production

³²⁴ E.g. Zhongguo shehui kexueyuan kaogu yanjiusuo 1986, 1994.

³²⁵ Li Yung-ti 2003.

³²⁶ E.g. Li Yung-ti 2003; Liu Yu and Yue Zhanwei 2011.

³²⁷ Archaeology perspective, e.g. Liu Li and Chen Xingcan 2003; Li Yung-ti 2003, 2007; Underhill 2002; Li Xiuzhen 2012. Art history, e.g. Bagley 1999; Ledderose 2000.

³²⁸ Franklin 1983a, 1983b.

³²⁹ Franklin 1983b:96.

³³⁰ Franklin 1992, 20, quoted in Li Yung-ti 2003, 19.

organisations existed at Anyang.³³¹ His evidence was based on a synthesis of archaeological evidence of multiple bronze workshops at Anyang, including rubbish pits, layouts and structures, debris in different areas, fragments of models, moulds and products, and remains of equipment and tools (crucibles, furnaces, burials, burned clay and grinding stones). Case studies of modern porcelain production in Jingdezhen and stoneware at Yixin have also been employed. On the evidence of chronology of both loci, Li attributed the development from holistic towards a more prescriptive production as the results of internal and external demands, hence efficiency was needed.³³²

By comparison, research on production of bronze triggers and arrowheads of craft organisation during the Qin dynasty (221-206 B.C.) suggested ‘a cellular production’ model based on empirical data, including measurements, chemical analysis and GIS mapping of thousands of weapons found in the Terracotta Army pits.³³³ Individual parts of bronze triggers and arrowheads were produced by multi-skilled units in batches and then assembled. This could only be achieved by specialisation with high standardisation. Following methods applied in the research of Terracotta Army weapons,³³⁴ I will use the metric and weight data of dagger-axes to explore possible patterns of their production.

As outlined in Chapter 5.1.4, a database of dagger-axe lengths and weights has been compiled (Appendix 5). Among a total of 213 items, type IV (113) represents the majority and is chosen as the sample data for this analysis. They came from four tombs- Fuhao (2),

³³¹ Li Yung-ti 2003.

³³² *Ibid.*

³³³ Li Xiuzhen 2012, 165; Martín-Torres et al. 2014.

³³⁴ Li Xiuzhen 2012.

Huayuanzhuang M54 (38), Guojiazhuang M160 (72) and Qijiazhuangdong M269 (1). Though all belong to type IV, their forms vary slightly, only those dagger-axes share the same form quality for further investigations. They could be divided into three sub-groups: 72 type IVA dagger-axes from M160 (Figure 6.1) and 27 type IVB (Figure 6.2) and nine type IVC (Figure 6.3) from M54. The analysis is based on an assumption that each group was commissioned and produced at the same time in the same workshop, in particular those (type IVB and C) which were inscribed with the deceased's personal names. From a common sense and modern economic perspective, using the same model to produce a number of the same forms of dagger-axes would be more efficient.³³⁵ As seen from Tables 6.2 (IVA), 7.3 (IVB) and 7.4 (IVC) showing descriptive statistics of those three sub-types, all sub-groups share the same coefficient of variation ($CV=0.09$) in weight. Subgroups IVA and IVB also share the same value of $CV (=0.02)$ in length. In comparison with the results of crossbows from the Terracotta Army of the First Emperor of Qin dynasty (246-221 B.C.) ($V=0.006-0.063$),³³⁶ it seems that the length of all three subtypes indicates relatively high standardisation, yet the weight shows more variety. The difference in weight is also supported by the large standard deviation ($SD=26.153, 27.50809, 35.62926$) shown in the descriptive statistics. One possibility is they may have different alloy compositions. Unfortunately, chemical analysis was only undertaken on one dagger-axe from M160 (295) in our sample among objects of our

³³⁵ Due to the unviability of metric and weight data of the majority of dagger-axes excavated, it is impossible to speculate if a large number of weapons were produced but then distributed widely, see Chapter 5.1.3.

³³⁶ Li Xiuzhen et al. 2014, 135.

analysis.³³⁷ Additionally, the presence of corrosion products will also affect the objects' weight.

Unlike the 'stack moulds' that might have been employed to produce the Qin trigger parts for efficiency and uniformity,³³⁸ Shang dagger-axes were produced using bi-valve clay moulds. A clay dagger-axe mould (PNM203:2) (Figure 6.4) found at Miaopubeidi locus provides some clues. It consists of two halves and is made of red and brown clay with fine sand. All sides, including the backs, are plain and smooth, which suggests that they were trimmed carefully. At one end (the tang's side), there is an oblong sprue gate 6cm long. The mould is designed to make type A dagger-axes with a length of 21.5cm.³³⁹ Made of clay mixture,³⁴⁰ the material indicates the mould can only be consumed once, as it has to be broken to extract the bronze product. This is supported by the remains of moulds found in bronze workshops that were all in a fragmentary state.³⁴¹ In contrast, bronze and stone moulds can be used multiple times.³⁴² The choice of clay moulds was inter-linked with the advanced ceramic industry in China which was in practice since the Neolithic period. As PNM203:2 was almost complete with only minor damage, and was uncovered in the context of a tomb near the Miaopubeidi bronze workshop, it was probably unused and served as a link between the

³³⁷ Zhongguo shehui kexueyuan kaogu yanjiusuo 1998, 178.

³³⁸ Williams 2008.

³³⁹ Zhongguo shehui kexueyuan kaogu yanjiusuo 1994. By comparison, the production of arrowheads is multiple. A partial one-sided mould (62PNH15) suggests one mould can cast either 9 or 11 pieces at a time, see Zhongguo shehui kexueyuan kaogu yanjiusuo 1994, 266.

³⁴⁰ Other ingredients include river sand, shell powder, etc. For a detailed study on the recipes of making clay moulds, see Liu Yu and Yue Zhanwei 2005.

³⁴¹ E.g. over 2000 ceramic mould fragments from Miaopubeidi excavated between 1958-1959, see Zhongguo shehui kexueyuan kaogu yanjiusuo Anyang gongzuodui 1986.

³⁴² So far, only one stone mould has been found in the Miaopubeidi workshop, see Zhongguo shehui kexueyuan kaogu yanjiusuo 1994, 87-88.

deceased and the bronze casting industry. Excavators suggested that the occupant of the tomb was likely to be a craftsman who worked in the Miaopubeidi bronze workshop.³⁴³

One possibility regarding the consistency of the shape, length and decoration (including inscriptions) of dagger-axes is that one model, or several models made to the same prototype, were employed. Dagger-axes are all single units except for their organic shafts. They are unlike the triggers and arrowheads of the Qin terracotta army that were made of multiple components and provide evidence for the study of standardisation and mass manufacturing.³⁴⁴ Further evidence is needed to identify exact production processes of dagger-axes at Anyang, though it is possible that they followed the same patterns as vessel production, as demonstrated by Li Yung-ti, moving from holistic towards a more prescriptive mode.³⁴⁵

6.1.3 Tool marks

While numerous studies have been devoted to bronze casting technology, clay moulds, decoration, inscriptions and the organisation of workshops,³⁴⁶ the finishing processes involved in bronze production is rarely touched. As discussed in Chapter 6, metalwork wear analysis on weapons does not just provide information on their practical use, but also reveals unparalleled production traces that are not available from other sources. As demonstrated in previous studies on stone and jade objects, it is possible to identify tools and techniques employed through tooling marks on artefact surfaces, in combination with results from

³⁴³ Zhongguo shehui kexueyuan kaogu yanjiusuo 1994.

³⁴⁴ Li Xiuzhen 2012.

³⁴⁵ Li Yung-ti 2003.

³⁴⁶ E.g. Liu Yu and Yue Zhanwei 2005; Dong Yawei 2006; Li Yung-ti 2007; Nickel 2006; Bagley 2009.

experimental archaeology.³⁴⁷ They would reveal processes involved at the final stage of weaponry production, in particular regarding the appearance and practical functions of weapons that enable them to perform their roles and play an active role in interacting with their users in their paths of lives.

On observations under lamp light with naked eyes, weapons' surfaces with little corrosion products appear to be smooth and with little evidence of surface working (see Figure 6.5). This suggests the excellent quality of filing and grinding employed during its finishing stage. However, the employment of a digital microscopy exposed multiple traces. Figure 6.6, obtained through the microscope (magnification scale 21x), shows clear tool marks on the blade body of the curve-spine knife 1945,1017.189. They are dense, multiple directional and sometimes overlapping. Curiously enough, they are not the only tool marks on weaponry surfaces. On seven weapons that have sharp cutting edges, striation marks are also observed on bevels (Figure 6.7). In comparison with marks on blade bodies (Figure 6.8), they display very different characteristics. The lines are much denser, equally spaced and parallel. The directions of strokes are disparate as well: the one on blade body is transversal and the edge one is diagonal.

We therefore need to question what those two different marks represent. What tools were involved and for what purposes? Unfortunately, little is known regarding surface marks on Shang bronzes. One exception is Dong Yawei 董亞巍's study on of bronzes from Sanxingdui site, Sichuan province.³⁴⁸ He proposed the use of rotary wheels for the cutting of holes in a

³⁴⁷ E.g. Sax et al. 2007; Strahan and Fenn 2007.

³⁴⁸ Dong Yawei 2006.

large bronze mask (measuring 65cm high and 138cm wide).³⁴⁹ However, his argument was based solely on observations, without any experimental data as supporting evidence. In addition, these cutting marks bear little resemblance to those observed on Shang weapons (see Figure 6.9). Nevertheless, there has been previous research into weaponry production using traces and marks evidenced in later periods.³⁵⁰ One particularly relevant project is the study of tool marks on weapons (swords, lances and arrows) from the Terracotta Army of the First Emperor of the Qin dynasty,³⁵¹ though the Qin weapons were manufactured almost one millennium later than those of the late Shang. Examination of silicon impressions of the surfaces of weapons under the SEM and stereomicroscope, in comparison with results from a number of experiments, identified two types of striations. The first type resulted from the filing process, using metallic hand-held tools (Figure 6.10). In this process, small amounts of metal from surfaces were removed, often immediately after objects were taken out of casting moulds. The striations were almost identical to those observed on the blade bodies of Shang weapons (the first type, discussed above, Figure 6.11): crude, irregular and cross-cutting each other. This similarity in characteristics suggests that the first type of striations on the blade bodies of Shang weapons are likely to be filing marks, produced using hand tools. It is difficult to make a judgement on the materials used for the hand tools, whether metallic or stone, as little is known regarding the hardness of Shang weaponry surfaces in comparison with Qin weapons and modern brass replicas.

³⁴⁹ *Ibid*, 44-45.

³⁵⁰ E.g. Tan Derui and Lian Haiping 1998; Zeng Zhongmao 1993; Dong Yawei 1999.

³⁵¹ Li Xiuzhen et al. 2011.

The second type of striations were interpreted as grinding marks to smooth the surfaces or sharpen the blades, using rotary wheels. They were similar to those observed on the bevels of Shang weapons (the second type, discussed above, Figure 6.12) - they appeared to be finer in comparison with the striations produced by the filing process, as well as being of high density and equally spaced (Figure 6.13). The resemblance strongly suggests that the second type of striations on Shang weapon bevels were produced by employing rotary wheels. This proposal is supported by archaeological evidence from Anyang, the late Shang capital site, where a ceramic example of a rotary wheel has been found.³⁵² It has been described as ‘partially damaged, grey ceramic [object] with high content of sand, rough surface, resembling grinding stone, in a round shape with a raised circle and traces of wear on surfaces’ (*ibid*, 242, author’s translation) (Figure 6.14). It is 27cm in diameter and 1cm deep. Unfortunately, this brief mention in a research monograph is the only record of the wheel, and the exact context of the find was not detailed, except that it was non-funerary.

It is worth noting that, among Qin weapons, the two types of marks only co-existed on arrows- filing marks on arrow tangs and grinding marks on arrow heads, but were observed on almost all the Shang weapons examined including dagger-axes (1915,0409.100, 1932,1014.19, 1932,1014.20, 1933,0413.11 and 1953,1215.1), spearhead 1953,1215.2, hooked-head knife 1981,1117.1 and curved-spine knife 1945,1017.189. The finishing process required the use of a file to remove excess amounts of metal and create smooth surfaces, and then grinding the surfaces for a finer finish or a sharp edge. However, this difference between

³⁵² Zhonguo shehui kexueyuan kaogu yanjiusuo 1994.

arrows and other weapon types was not addressed by Li Xiuzhen et al.³⁵³ One explanation might be the level of craftsmanship that Qin weapons achieved. In order to attain high quality finishes on arrowheads, swords and lances, the blade body and the blades were subjected to grinding after filing. This has resulted in the removal of filing marks as part of the subsequent grinding process. Curiously enough, for Shang weapons, grinding was only applied to the blade edges for sharpening, and not to the blade body.

As the objects analysed were unprovenanced, there was a possibility that the striations could be ascribed to post-excavation changes. Yet, there are two strands of evidence suggesting that this interpretation is to be refuted. Firstly, the eight weapons bearing tool marks were acquired by the British Museum from multiple sources at different times. For example, dagger-axe 1933,0413.11 was purchased from the Karlbeck Syndicate in 1933 while curved-spine knife 1945,1017.189 was bequeathed by Oscar Charles Raphael in 1945. It is unlikely that they all happened to receive the same filing and grinding treatment under different owners. Secondly, some of the striations are partially covered by corrosion products (Figure 6.15), indicating that they were pre-depositional in origin.

In combining evidence from observations, comparative studies and archaeological data, I argue that rotary wheels were employed by the Shang to sharpen bronze weapons. This is the earliest evidence to-date of the use of rotary wheels in China. Although the exact mechanism is unclear, we can speculate that utilising rotary wheels for sharpening weaponry blades was much more efficient than using hand tools. The use of rotary wheels has also been observed

³⁵³ Li Xiuzhen et al. 2011.

for jade incising and carving during the ‘Spring and Autumn’ period (770-481 B.C.).³⁵⁴ Although further analysis and experimentation are required, current evidence suggests a continuity of bronze crafting techniques from the late Shang to later periods and the utilisation of similar tools to work different materials.

6.1.4 Summary: production of a dagger-axe

The above discussions have explored multiple aspects of bronze weapon production. To further demonstrate how value and significance are woven into the production of bronze weapons, I have built a chart outlining the step-by-step procedures of making a weapon following Joy’s work on the Portesham mirror’s manufacture.³⁵⁵ It aimed to explore ‘the potential biographical information’, such as choices of materials and designs embedded in the mirror at the time of its birth and the involvement of many individuals at every step which ‘provided different settings for social interaction’.³⁵⁶ I have selected bronze dagger-axe M54:93 from Huayanzhuan M54, Anyang as an example, the most common type of weapon in the late Shang (Figure 6.16).³⁵⁷ It is one of 30 dagger-axes, similar in shape, length and weight, that bear the same cast inscription ‘*yachang*’ 亚长 on both sides of the tang. In the form of a long blade with a socketed tang, M54:93 is 25cm long and weighs 0.45kg. Despite minor damage on the tip of the blade, the object is preserved in good condition with the partial remains of a wooden shaft in the socket. The tang’s termination is decorated with five

³⁵⁴ Yang Jianfang 2009.

³⁵⁵ Joy 2007.

³⁵⁶ Joy 2009, 546.

³⁵⁷ Zhongguo shehui kexueyuan kaogu yanjiusuo 2007.

raised straight lines.³⁵⁸ Chart 7.2 presents the manufacturing process for M54:93. Although it is only one of the many thousands of dagger-axes found at Anyang, the chart nevertheless represents a series of procedures, materials and equipment required for making dagger-axes that draws upon archaeological evidence of bronze workshops at Anyang and experimental work.³⁵⁹ In the following section I will focus on four aspects, namely the materials, designs, inscriptions and post-casting procedures of M54:93 in order to illustrate the significance of the birth stage. It is unclear whether M54:93's wooden/bamboo shaft was manufactured separately at a different locus and then assembled, or if it formed part of the dagger-axe production process at the same workshop. I will thus focus solely on the production of the metal element of M54:93.

³⁵⁸ I will discuss the meaning of *yachang* in Chapter 8.2.2.2.

³⁵⁹ Zhongguo shehui kexueyuan kaogu yanjiusuo 1994; Li Ying-ti 2003; Dong Yawei 2006;

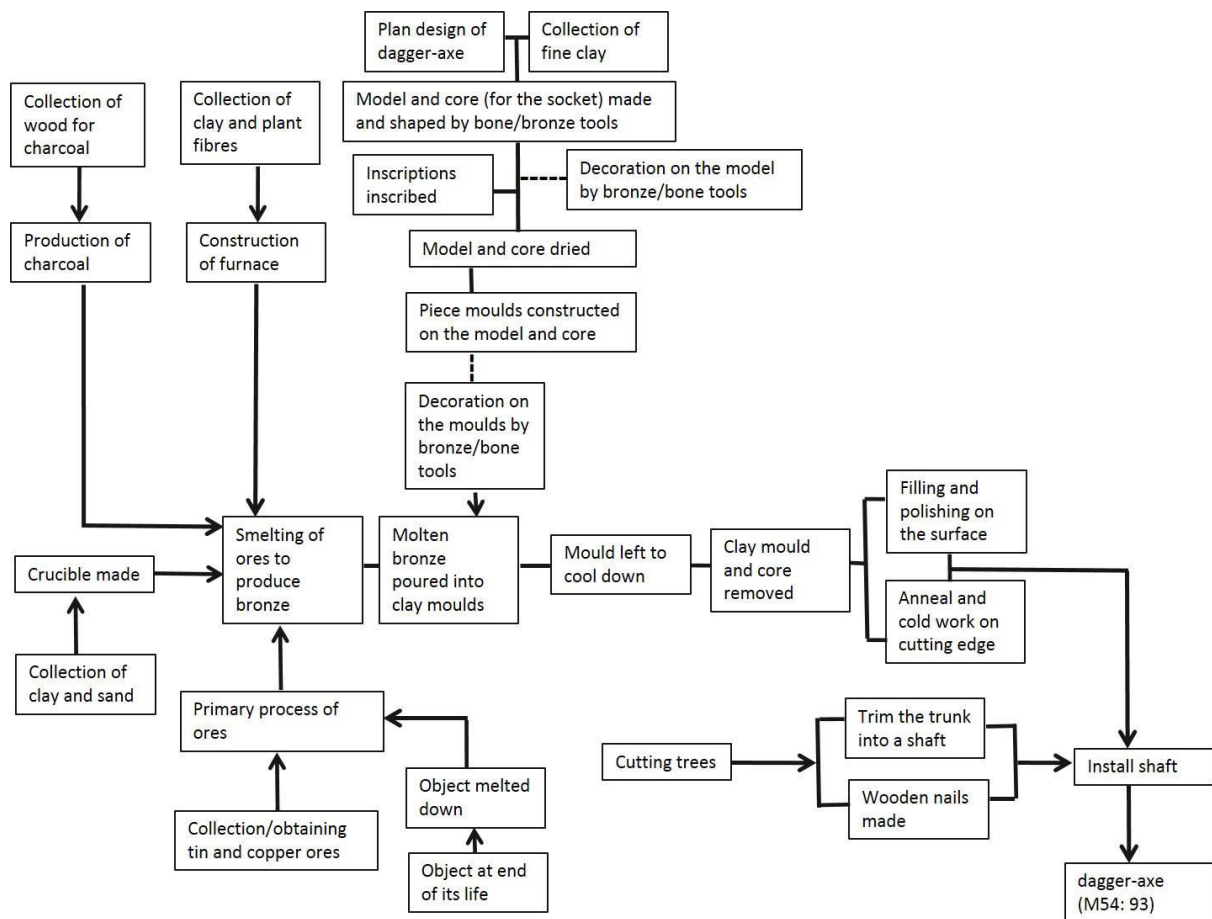


Chart 7.2 Production process of bronze dagger-axe (M54:93) (after Joy 2009, Figure 2, 547)

No metallurgical analysis of M54:93 has been carried out. Studies of other dagger-axes in M54 suggest that it is made of a copper alloy, probably copper and tin.³⁶⁰

Regarding the design of M54:93, it has been suggested that it represents a hybrid product of Shang dagger-axes with flat tangs and northern style socketed weapons.³⁶¹ This style of dagger-axe first appeared at the Taixi site during the middle Shang, became popular during the early phase of the late Shang and then became less common in the later phases of the late

³⁶⁰ Zhongguo shehui kexueyuan kaogu yanjiusuo Anyang gongzuodui 2004, 277.

³⁶¹ Lin Yun 1998; Jing Zhongwei 2011.

Shang.³⁶² The innovation is in the method of shaft installation. Instead of inserting a tang into the wooden shaft, as with typical Shang dagger-axes, M54:93 has a socket for the shaft, which was then bound by cords. This requires an extra step in the manufacturing process using a core to create a socket at the front part of the tang. It has been seen as an improvement of dagger-axes' shaft installation in order to increase their lethal strength and practicality in fighting.³⁶³ The theory that its inspiration came from the northern style socketed axes suggests close interactions between the Shang and the northern groups.³⁶⁴

Although M54:93 and the other 29 pieces belong to a common type of dagger-axe, inscriptions on them suggest they were specifically commissioned. The '*yachang*' (sometimes '*chang*') inscriptions also appear on 98 bronzes in the same tomb, including spearheads, broad flat axes, vessels, bells, and chariot-and-horse related items. The exceptions are one dagger-axe and one cauldron with other inscriptions. Compared to other elite tombs, it is quite unusual to have this large quantity of bronzes sharing the same inscription. For example, in the assemblage of Guojiazhuang M160, among 44 inscribed bronzes, there are four different inscriptions and each is on a number of pieces. One further observation is that many '*yachang*' inscriptions are inlaid with turquoise. Together with the burial items, in particular the quantities of bronze vessels (40) and weapons (249) interred, the excavators suggested the deceased to have been a high status elite and military leader of the '*chang*' lineage.³⁶⁵ In comparison with weapons without any inscriptions, extra layers of relationships are seen in M54:93 and the other 29 pieces. Their production requires an extra

³⁶² Hebeisheng wenwu kaogu yanjiusuo 1985; Jing Zhongewi 2011.

³⁶³ Jing Zhongwei 2011, 66.

³⁶⁴ Zhu Fenghan 2013.

³⁶⁵ Zhongguo shehui kexueyuan kaogu yanjiusuo 2007; He Yuling 2013.

step to add the inscriptions, for which additional work and the involvement of a scribe are required. The location of the inscriptions meant that they would be immediately obvious to any viewers, increasing the influence of the dagger-axes as well as the named person.

Once the dagger-axe was removed from the clay mould, a number of post-casting procedures took place. Excess bronze from casting would be removed through filing, followed by grinding and then polishing. Regarding the treatment of blades, metallographic analysis of one spearhead (M54:4) and two dagger-axes (M54:81 and 226) showed that forging, annealing and cold work were carried out to increase strength and durability.³⁶⁶ Furthermore, it is possible the blades of some weapons were subjected for sharpening. From observations on the collection of Shang bronze weapons at the British Museum, some are sharp-edged and few are rather blunt (see Chapter 5.1.1).³⁶⁷ One example to be illustrated here is a dagger-axe (1948,0716.40) (see Appendix 1) with a blunt edge (Figure 6.17). In the case of M54:93, until metalwork wear analysis is carried out, the effectiveness of the blade remains unknown.

6.2 Jade weapons

The discussion of bronze weaponry making has demonstrated the importance of production stage in their lives and provided us a dynamic view of weapons, rather than just one fixed perspective. For jade weapons, its making would also contribute significantly in its life biographies. Yet as Shang jade weapons are skeuomorphs of bronze examples,³⁶⁸ it is possible to consider jade was one of the two main desirable materials that the Shang chose,

³⁶⁶ Zhongguo shehui kexueyuan kaogu yanjiusuo Anyang gongzuodui 2004, 299.

³⁶⁷ Full report of the metalwork wear observations is in Appendix 1.

³⁶⁸ Though jade weapons first appeared during the Neolithic, the Shang examples were mainly derived from bronze counterparts. I will discuss the inherent links of Shang jade weapons to earlier pieces in Chapter 8.2.1.3.

based on current archaeological evidence. Therefore, the jade material is the main focus of this section. I argue that the materiality³⁶⁹ of jade material prescribes production procedures of weapons and constitute the value embedded in jade weapons at the birth stage.

7.2.1 Definitions of jade material

In geological term in English, jade normally includes two main stone groups: nephrite and jadeite. For the time period discussed here, only nephrite is known to have been used in China, jadeite was not introduced to China from Burma until the 18th century. A type of composite mineral, nephrite is a variety of the calcium and magnesium-rich amphibole with Mohs hardness between 6.0 and 6.5.³⁷⁰ However, in Chinese language, the use of the term ‘玉’ does not confine to nephrite or jadeite, but applied generically to beautiful stones. Concepts of jade are likely different among regions and time periods. It is then no surprise that in some archaeological reports that objects made of other minerals were classified in the jade category. One example is a dagger-axe PLZM1:33 from Lijiazui M1, Panlongcheng site, Early Shang. It was identified as serpentine, yet it was still placed under ‘jade’ and then ‘ceremonial implements’ in the report.³⁷¹

Further, regarding categorisation in archaeological reports, identification of jade is mostly carried out by naked eyes and their validity is questionable. One example is 224 jade artefacts from Huayuanzhuang M54, Anyang.³⁷² They were classified in the jade category by

³⁶⁹ Materiality emphasises interactive relationships and effects between physical properties of materials, people and the society, see Miller 2005.

³⁷⁰ Jing Zhichun et al. 2007.

³⁷¹ Hubeisheng wenwu kaogu yanjiusuo 2001, 202.

³⁷² Zhongguo shehui kexueyuan kaogu yanjiusuo 2007.

appearance, but a systematic non-invasive study using a Portable Infrared Mineral Analyser (PIMA) indicated 184 of them are nephrites and 40 are stones.³⁷³ As most jade objects in archaeological reports are not scientifically tested, it has created a barrier in the study of jade weapons as the definition and classification of jade material varies in published reports.

Another issue is whether people of the Shang were able to tell jade from other minerals or stones. Jing Zhichun 荆志淳 and others argued the identification skill was mastered by a small group of Shang people. The evidence was based on tests of jade and non-jade objects, their craftsmanship and archaeological contexts in Huayuanzhuang M54.³⁷⁴ However, considering the result comes from a study of one sample tomb, further studies are needed before any conclusions can be reached. It is probable that the Shang may use other types of minerals or stones deliberately as replacements for jade in certain circumstances. There are also possibilities of older pieces (either jade or stone, see Chapter 4.1.1 on jade use during the Neolithic) being re-used/worked by the Shang and their extensive biographies may have an impact on their use despite their materials. One of the most well-known examples is the so called ‘jade phoenix’ from the tomb of Fuhao,³⁷⁵ which was considered to be an ‘antique’ to the Shang.³⁷⁶ Although applying a modern mineralogical definition to ancient jade research does have its merits,³⁷⁷ more scientific examinations are required in combining with contextual analyses to build up an understanding of Shang jade use. As the identification of

³⁷³ Jing Zhichun et al. 2007.

³⁷⁴ *Ibid.*

³⁷⁵ Zhongguo shehui kexueyuan kaogu yanjiusuo 1980.

³⁷⁶ There are still disputes regarding the origin of jade phoenix. Some argued it came from Shijiahe, a Neolithic culture in the Changjiang region (e.g. Rawson 2002; Lü Jianchang 1996); others considered it a product of Anyang (e.g. Chen Zhida 1998).

³⁷⁷ It was first proposed by Xia Nai (1982) and followed by many other researchers, e.g. Jing Zhichun et al. 2007.

nephrites among jade and stone weapons is beyond the scope of this thesis, I will therefore follow categorisations of jade weapons in archaeological reports in this thesis. It is likely those jade weapons include a mixture of nephrites and other materials, but the focus will be their contextual use.

6.2.2 Materiality and jade production

Regarding the material of jade weapons, the first to consider is the origins of jade stones. Many reports and studies claimed the Shang obtained jade stones from Hetian 和田, Xinjiang,³⁷⁸ a known region for its nephrite mine and argued it as evidence for long distance trade or exchange. However, as a few recent studies pointed out, little is known regarding the distributions of ancient jade stone mines and very few scientific analyses have been carried out on jade artefacts to build up a database for comparisons.³⁷⁹ Speculating possible origins of jade materials without supporting evidence is not helpful to further our research. Yet, it is crucial to recognise the deposits of nephrites are not common and they are often scattered and occur in small-scales only.³⁸⁰ The rarity of raw materials would certainly contribute to the artefacts they are made of. Thus, using the jade to produce weapons has highlighted the significance of those bladed implements as well as adding their value as precious materials at the birth stage of those jade weapons.

Secondly, the micro structure of nephrites is closely linked with the production process. Their unique interweaving fibre textile structures have determined they have high toughness and

³⁷⁸ E.g. Zhongguo shehui kexueyuan kaogu yanjiusuo Anyang gongzuodui 1977; Shen Bin 1991.

³⁷⁹ E.g. Jing Zhichun et al. 2007; Yu Fuxi et al. 2011.

³⁸⁰ Jing Zhichun et al. 2007, Footnote 1, 348.

density.³⁸¹ It is only possible to grind jade gradually using saws or cords together with water and sand to shape, carve or drill a piece of jade, rather than direct chipping, and this is hugely labour consuming.³⁸² This provides the jade a quality of endurance and permanence that is probably cherished by people who make and use them.³⁸³ In comparison, metals can be melted down; ceramics break easily; wood and other organic material decay gradually.

Thirdly, jade has been a prestige and treasured material since the Neolithic. Appreciation of jade continued during the Shang, and some of the jade forms, nobly broad flat axes, were inherently linked in style. Though the use of jade and its significance probably varies among different periods and regionals, the long tradition of jade using would play a part in the value building of Shang jade weapons.³⁸⁴

Lastly, colours of jade matter. They range from translucent white to yellow, dark green, grey and black, and would create an immediate visual impact to the viewers. In addition to natural tone,³⁸⁵ they could be affected by a number of factors, such as place of origins, and mineral formations. In particular, burial conditions (e.g. the acidity of soil) and treatments (e.g. heated by fire) may have profound change on jade colours.³⁸⁶

All these characteristics of jade have demonstrated the uniqueness and preciousness of the material. The making of jade weapons are no longer mere combinations of materials and

³⁸¹ Rowcliffe and Frühauf 1977.

³⁸² Experimental archaeology suggested saws can be either wood, bamboo or stone flakes; cords were often leather straps or hemp cords, see Yang Jianfang 2009.

³⁸³ Rawson 2002.

³⁸⁴ Cf. Gosden and Lock 1998.

³⁸⁵ The natural tone of jade colours depends on the percentage of iron compositions and other elements, see Burns 2005.

³⁸⁶ Jing Zhichun et al. 2007.

forms, or a prestige material employed to highlight the form, but composites that are embedded with value and significance of both, which probably set up different trajectories from their bronze counterparts, of which I will discuss in Chapter 8.2.13.

6.3 Summary

Viewing weaponry production from a biographic perspective has revealed the complexity and differences behind in the making of weapons of bronze and jade materials and also enable us to evaluate value and meaning being built into a weapon in the production process. The difficulty in obtaining the raw materials would play a part in the value of products. Some may come from faraway places; some may not be obtained easily. For example, to making bronzes would require the gathering of copper, lead and tin, which do not occur naturally at one place. The material qualities of a specific material have also preconditioned techniques and processes employed in producing weapons. For instance, the micro structure and toughness of jade requires labour-intensive gradual grinding work. The adaptation of particular techniques may also be related to established practices, e.g. the casting technique of making bronzes is linked to the advanced ceramic industry since the Neolithic. Decoration and inscriptions would require extra steps and they were most likely to be commissioned, which would make the objects visually distinct from others. In the case of bronze weapons, there is also the finishing work of grinding the cutting edges, which would make the implements lethal, though not all pieces received such treatment. The various steps employed and applications of particular techniques to transform the raw materials into finished products are structured and meaningful, though which certain values and significance, as well as human agency are

weaved into the products. This is likely to have an effect to weapons' later life histories,³⁸⁷ which I will explore in Chapter 8.

³⁸⁷ Based on studies of metalwork found in water places, Bradley (1998) argued only certain types of objects with particular decorations were deposited, which suggested a planned trajectory for some objects from the production stage.

Chapter 7 Weapons in tombs

The majority of weapons were deposited as grave goods and they form the largest dataset for this study. In this chapter, through qualitative and quantitative approaches, I will explore the characteristics and patterns of weapons in tombs in order to shed light on their use, significance and relationship to the people of the time.

7.1 Distribution of weapons in burials

As detailed in Chapter 5.1.4, 121 elite tombs and 91 Guojiazhuang lineage tombs have been selected and compiled in Excel spreadsheets for my investigations (Appendix 3). Various statistical tools will be applied depending on the specific research questions to be addressed, as well as a selection of the relevant data to answer the questions. Descriptive statistics have been employed in Chapter 8.1.1 to provide a general overview of the two databases and assess the presence/absence of weapons of various materials and types among all tombs in the two databases. Ratios and quantities of various materials and types of weapons are compared between the two databases, which indicate the complexity of weaponry assemblages in tombs. The second analysis (Chapter 8.1.2) explores changing patterns in the occurrences of weapons of various materials across chronological phases. The trends are analysed in comparison to other variables in tombs to seek any chronological significance. Correlation tests are carried out in Chapter 8.1.3 to explore associations between weapons and other variables to infer the status of weapons in tombs. For example, whether relationships can be identified between sets of drinking vessels, generally considered to be closely linked to social status, with a specific material of weapons. Correlation tests have also been applied to various types of weapons, thus revealing any deliberate combinations existing in assemblages. The last section (8.1.4) will discuss the spatial distributions of weapons in tombs.

7.1.1 An overview

Large numbers of objects were uncovered in most of the 121 elite tombs. Over half of the tombs (76) contained more than 10 items as burial goods, and the largest assemblage comprised 1887 objects (Xiaotun M5).³⁸⁸ Notably, 102 tombs contained bronze weapons, representing 84% of the total number of tombs. Among both bronze and jade weapons, dagger-axes were the dominant form, representing more than half of the weapons (see Charts 8.1 and 8.2)³⁸⁹ Spearheads were the second most common types of bronze weapons (27%). There were also large numbers of bronze arrowheads (246 bunches) in elite tombs, but jade examples were rare with only five in total. In contrast to bronze and jade, there were few bone, stone and shell weapons- 24 tombs having a combined total of 40 examples.

³⁸⁸ Most tombs contained cowries and/or clams. While most tombs have fewer than ten cowries or clams, M34 has 280 clams. As discussed in Chapter 5.1.4, I have excluded cowries and clams in the total number of burial goods to avoid an unbalanced statistical representation of burial assemblages.

³⁸⁹ As noted by Xu Jian (2015), the overall quantity of spearheads was the highest at Anyang, but the statistic was skewed because one of the royal tombs alone, Xibeigang M1004, yielded over 700 examples. For the report on Xibeigang M1004, see Liang Siyong and Gao Quxun 1970.

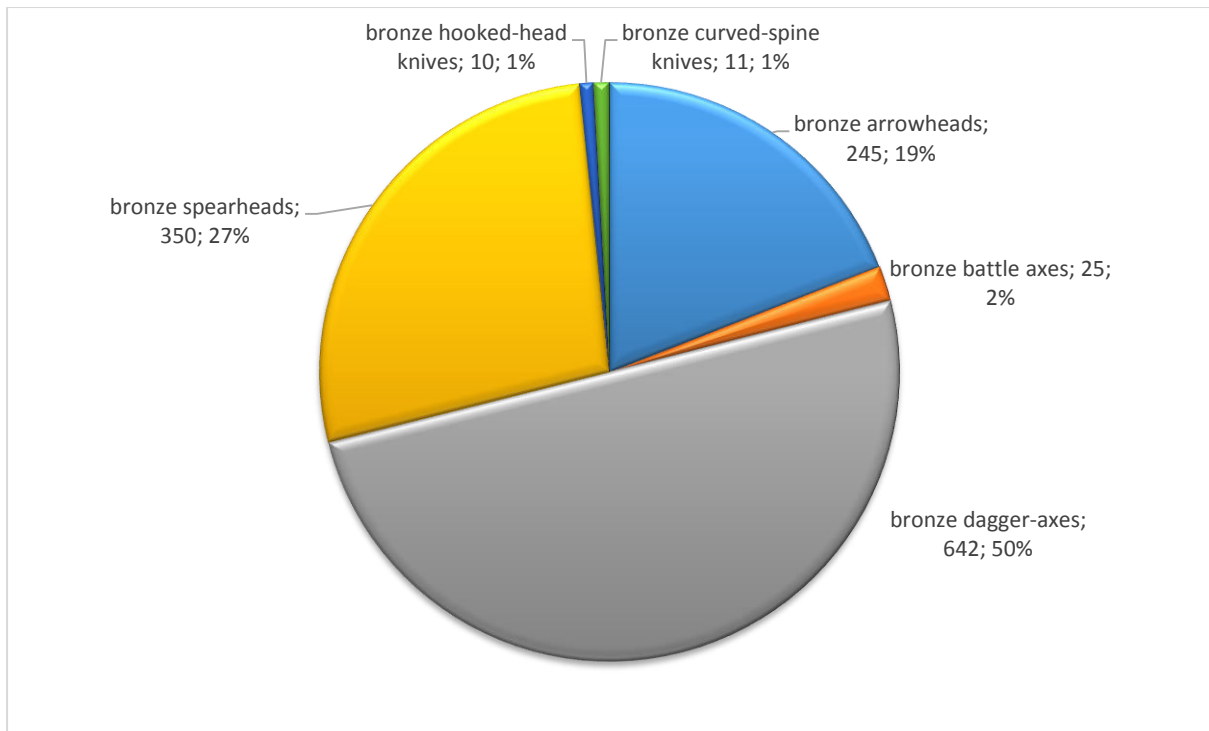


Chart 8.1 Elites tombs: the distribution of various types of bronze weapons (n= 1283)

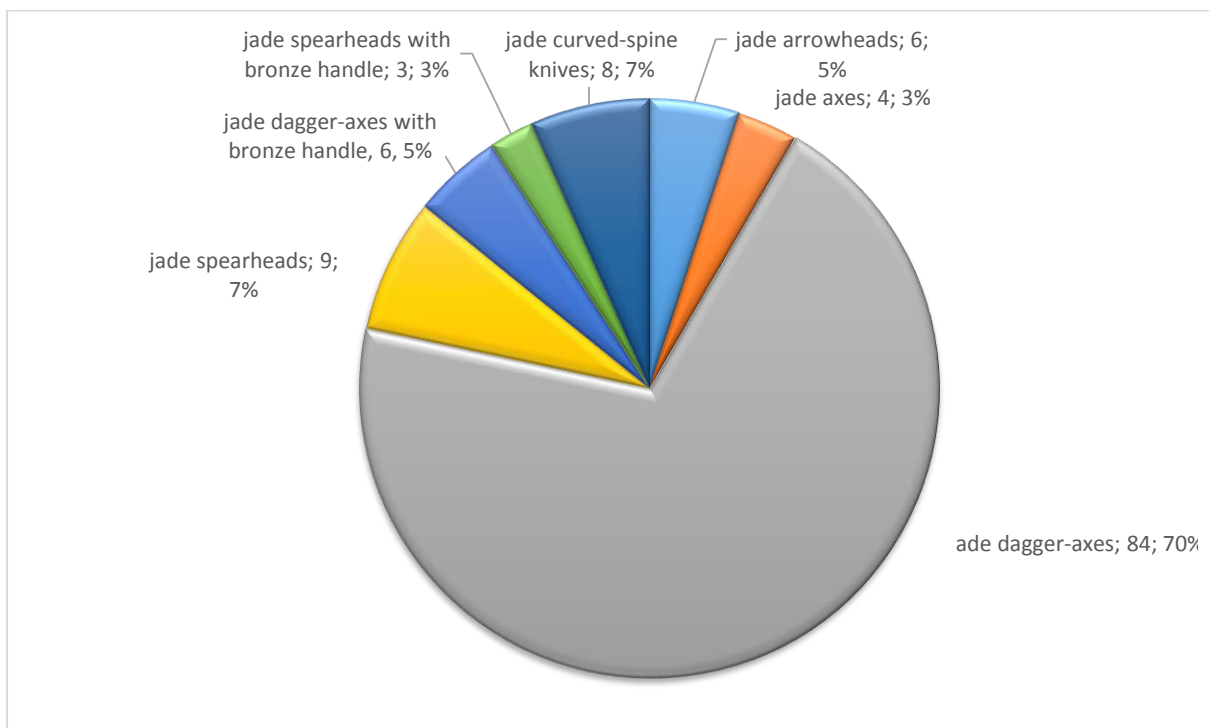


Chart 8.2 Elite tombs: the distribution of various types of jade weapons (n=120)

Within the 91 tombs in the Guojiazhuang cemetery, comparatively modest numbers of objects were found. With the exceptions of M44, which had none, items in tombs ranged from one to 435. It is particularly interesting to note that 24 burials were interred with bronze weapons, representing 26% of the total tombs. This correlates with Campbell's survey findings on weapons in the lineage cemeteries of Xiqu, Guojiazhuang and Liujiashuang that 20% of the tombs contained weapons.³⁹⁰ Dagger-axes were the only bronze weapon type present, with the exceptions of a single bronze spearhead in M32. There were very few jade and bone weapons. Only M160 contained six jade weapons, and M53 had one bunch of bone arrowheads. There was an absence of any stone or shell weapons.

The ratios of various materials of weapons varies largely between elites and Guojiazhuang lineage members (see Chart 8.3). There is an overwhelmingly large proportion (84%) of elite tombs buried with at least one bronze weapon, in contrast to 26% of Guojiazhuang lineage members.³⁹¹ A sharp contrast was also observed regarding the presence of stone, bone and shell weapons (20% in elite tombs as opposed to 2% in lineage tombs). Jade weapons were exclusive to elite burials. None of the Guojiazhuang lineage members had any jade weapons (except M160, which from its finds assemblage is an elite tomb, see Chapter 5.1.4), though some of them contained other jade objects (see Appendix 3). Despite jade weapons being exclusive to elite burials, they were not ubiquitous, with only 24% of elite tombs containing them, with a much lower frequency than those who had bronze weapons (84%). It is tempting to explain the disparity between elite and lineage tombs in terms of purely economic factors, as bronze and jade are more valuable materials in terms of both intrinsic value and production

³⁹⁰ Campbell 2007.

³⁹¹ In Campbell's thesis, he listed that 20% of the overall tombs at Anyang were interred with weapons (2007, 191), but many of the tombs in his database had been looted.

requirements (see Chapter 7). However, if this was the case, we would expect stone, shell and bone weapons, as easily obtained and worked materials, to be more prevalent in lineage tombs than elite tombs. As this is not the case, other explanations must be sought. As we are working with mortuary data, there is a lack of comparative data for weapons from non-funerary contexts (see Chapter 5.1.2). Though shell and bone are organic materials, they commonly survive in archaeological contexts, unless it is soil of high acidity, and this cannot therefore be taken as a factor. One possibility is that weapons of stone, shell and bone may not have been seen as desirable items to be buried with for lineage members, but elites did not share this aversion. Alternatively, they may have other associations and do not necessarily relate to economic factors. For instance, the non-barbed form of bone arrowheads from Guojiashuang M53 and other elite tombs, suggests that they were likely to have been for hunting rather than weapons of war (Figure 7.1).³⁹² Their exclusivity, reflected in their occurrence in only a small number of elite burials, implies the importance of hunting to the nobility. This example shows the complexity of weapons in tombs, in terms of material, varieties and quantities, of which I will explore more in the forthcoming sections.

³⁹² Based on depictions of different forms of the characters *shi* 矢 (arrows) and *she* 射 (shooting) in oracle bone inscriptions and on archaeological finds, Yue Hongbing 岳洪彬 and Yue Zhanwei 岳占偉 (2009) argued that arrowheads without barbs were used in order to catch animals alive or keep the fur intact, while arrowheads with barbs were most likely for larger animals and warfare.

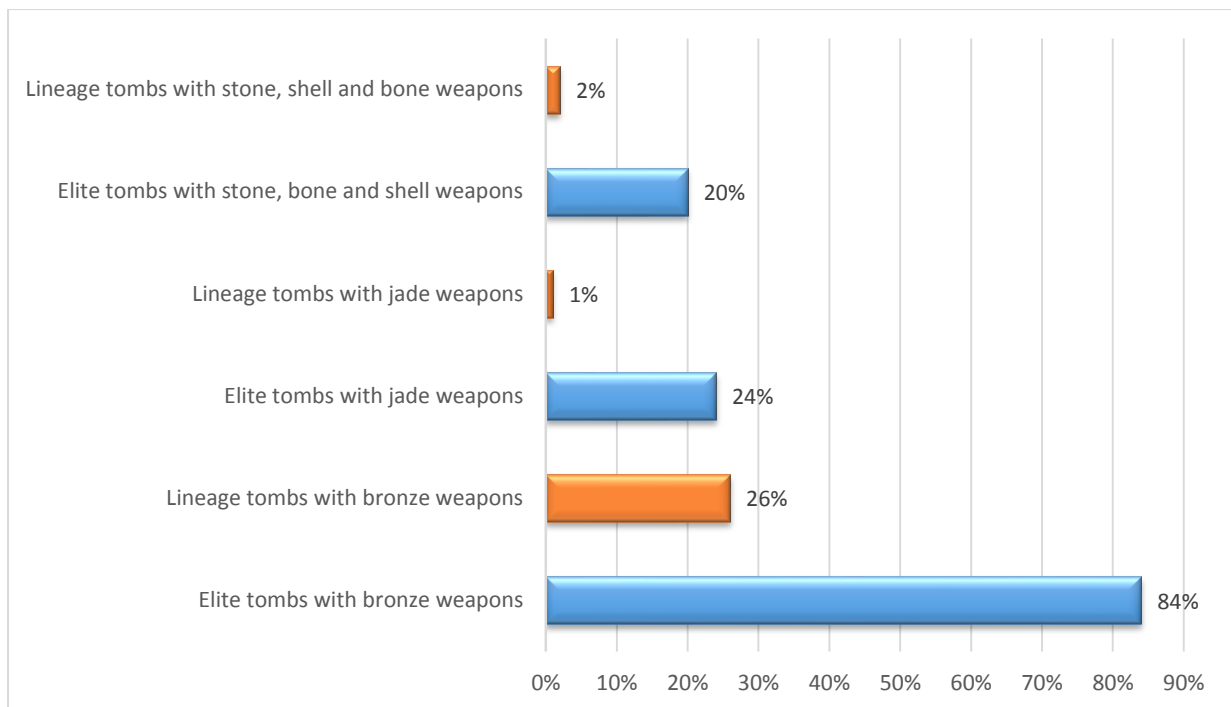


Chart 8.3 Elite and Guojiazhuang lineage tombs: ratios of jade and bronze weapons

7.1.2 Is there a diachronic pattern?

The elite tombs in the dataset cover the whole of the late Shang (phases 1 to 4), and were dated through typology and specific combinations of ceramic and bronze vessels found in tombs (see Table 7.1). For the Guojiazhuang lineage tombs, none dated to phase 1, but all were from phases 2 to 4. The question naturally arises: are there any diachronic changes from the early to the later phases? A histogram of weapon numbers (of all materials) among the 121 elite tombs and 91 Guojiazhuang tombs provides us with an overview of the data. Charts 8.4 demonstrates that the majority of elite tombs (more than 110) had one to 100 weapons (seen from the first three bars) and a small number of tombs have overwhelmingly large numbers of weapons (more than 100, the low bars). These outliers are Xiaotun M5, Huayuanzhuang M54 and Guojiazhuang M160. For example, H

Uayuanzhuang had 277 weapons, while the mean number of weapons from the elite tombs was 12.66. Those three tombs are also the largest complete tombs ever uncovered at Anyang. In comparison, no similar tombs are dated to phase 1 or 4. The inclusion of those three tombs would only obscure any possible patterns in the dataset and place too much emphasis on phases 2 and 3. Thus, those three tombs are removed from both datasets and they will be studied separately in Chapter 8.2. Similar patterns were also observed on Chart 8.5, the majority of lineage tombs (90) have one to 20 weapons (the high bar) and one tomb (Guojiazhuang M160) had over 300 weapons (the low bar). Since there are only seven elite tombs from the 1st phase and none in the Guojiazhuang cemetery, the lack of an even distribution of tombs across phases means phase 1 is underrepresented. Hence the seven tombs from phase 1 as well as two tombs with uncertain dates are removed from the elite tomb database (n=109) and five tombs with uncertain dates removed from the Guojiazhuang lineage tomb database (n=85). Considering that the total numbers of stone, shell and bone weapons are small in both elite (n=19) and Guojiazhuang lineage tombs (n=1), I will focus mainly on weapons of bronze and jade materials.

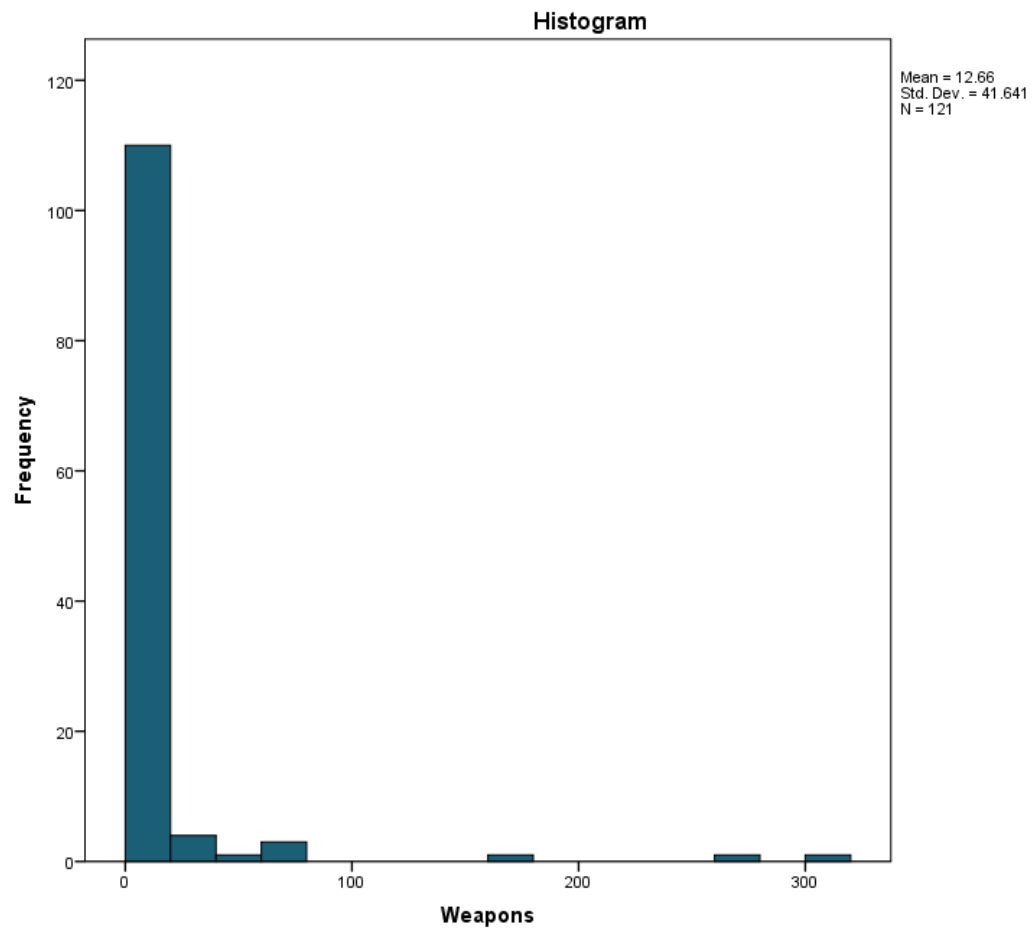


Chart 8.4 Elite tombs: histogram of weapon numbers

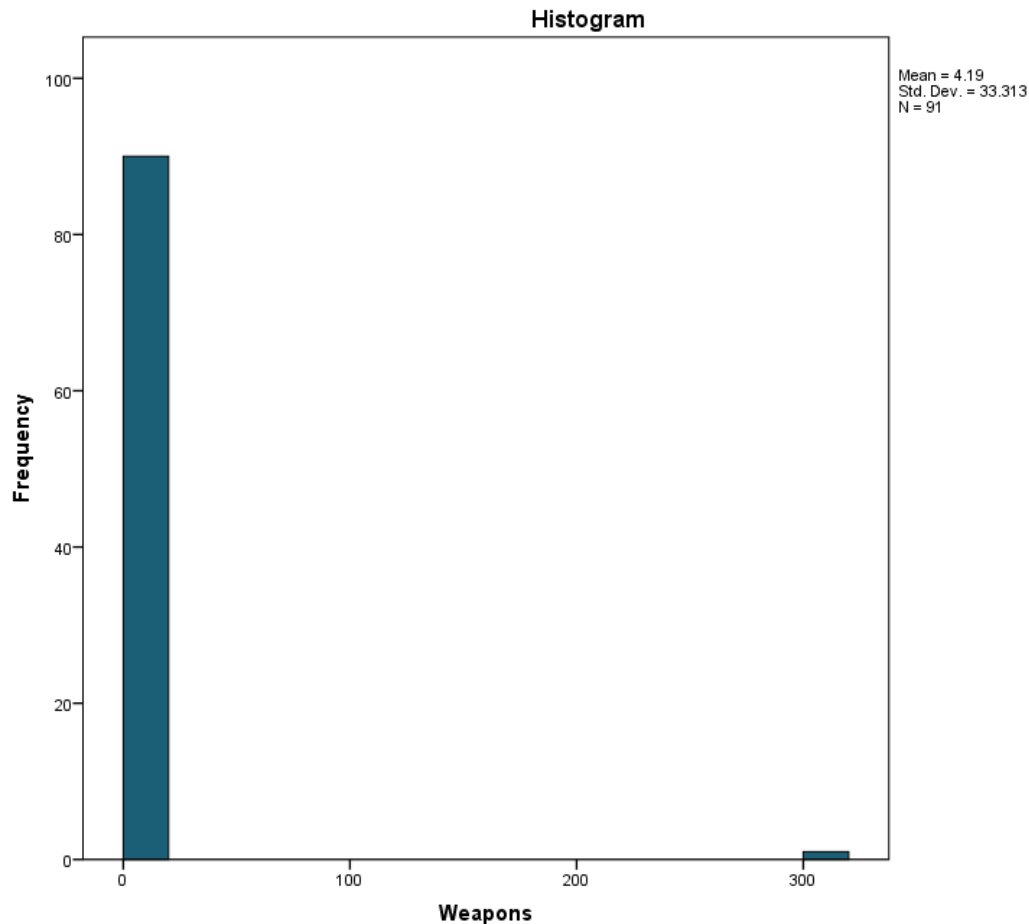


Chart 8.5 Guojiazhuang lineage tombs: histogram of weapon numbers

As seen from Chart 8.6, there is an overall increase of bronze and jade weapons from the 2nd to the 4th phases in terms of quantities in elite tombs. Regarding mean numbers, there is a slight fluctuation- a minor decline of bronze weapons in the 3rd phase, but an overall increase for both jade and bronze weapons (Chart 8.7). Yet, Chart 8.8 reflects a sharp decline in the percentages of tombs interred with bronze weapons, which suggests more bronze weapons were included in individual tombs in later phases. For jade weapons, as the percentage stays quite stable over time, it also suggests an increase of jade weapons in individual tombs. Does this trend reflect the development of the bronze and jade industries and more resources becoming available? As the chronologies of those tombs are based on vessel assemblages,

other variables in tombs need to be taken into consideration while discussing diachronic patterns of weapons. A comparison with other variables in tombs is needed.

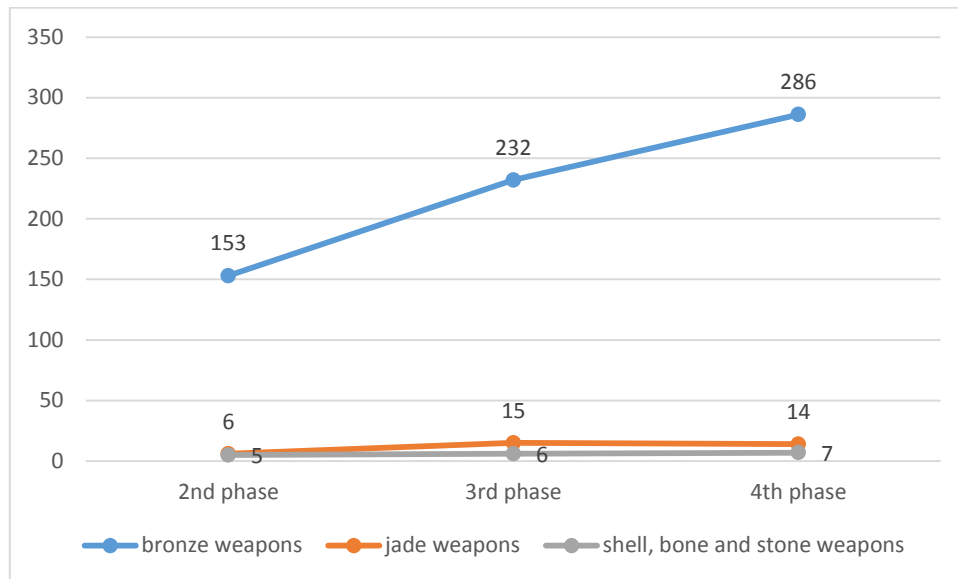


Chart 7.6 Elite tombs (n=109): quantities of weapons of various materials from phases 2 to 4

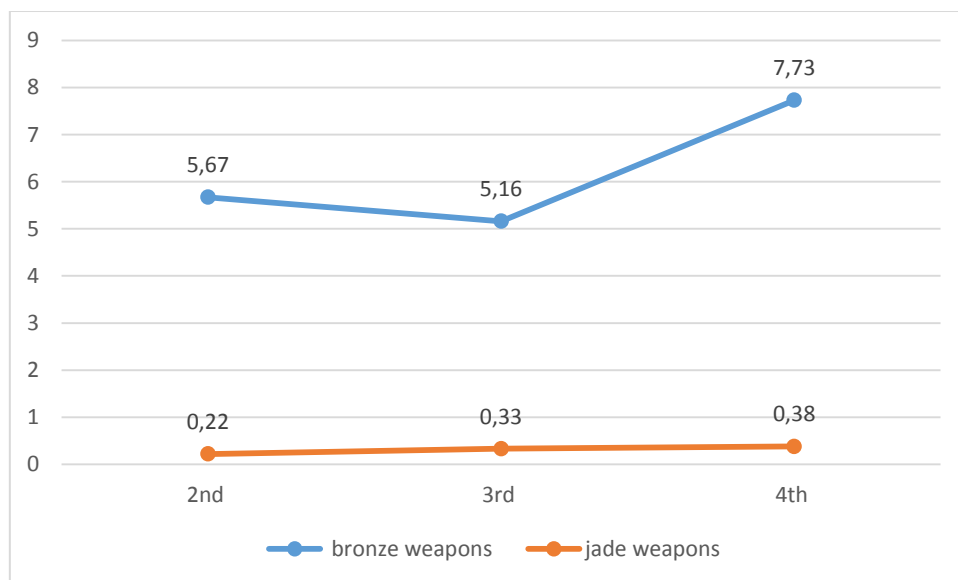


Chart 7.7 Elite tombs (n=109): mean numbers of bronze and jade weapons from phases 2 to 4

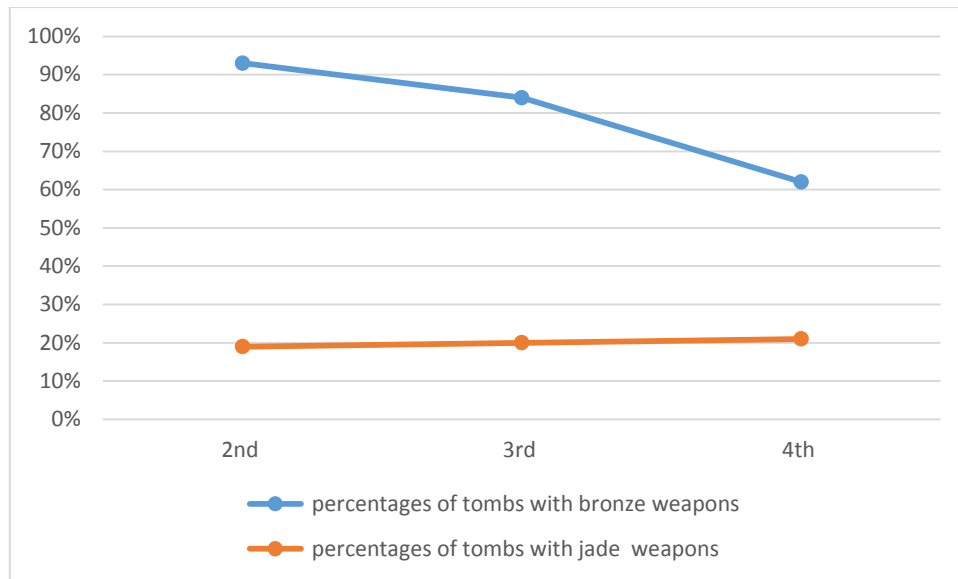


Chart 7.8 Elite tombs (n=109): percentages of tombs with bronze and jade weapons from phases 2 to 4

Table 7.2 and Chart 8.9 show trends of tomb volumes, human sacrifices, dogs, total numbers of burial goods, ceramics, bronze vessels and jade objects in elite tombs. Numbers of jades and sacrificial dogs and humans fluctuated but slightly declined on the whole; tomb volumes, total numbers of goods, quantities of ceramics and bronze vessels all increased over time with minor drops in the 3rd phase. The reasons behind all these changes are beyond the scope of this thesis, but nevertheless there is an overall enrichment of tomb content (except jade) and a higher investment of human labour (tomb volumes), which correlates with the patterns observed in quantities of bronze and jade weapons. It also highlights the abnormality of the decrease regarding percentages of tombs that had bronze weapons.

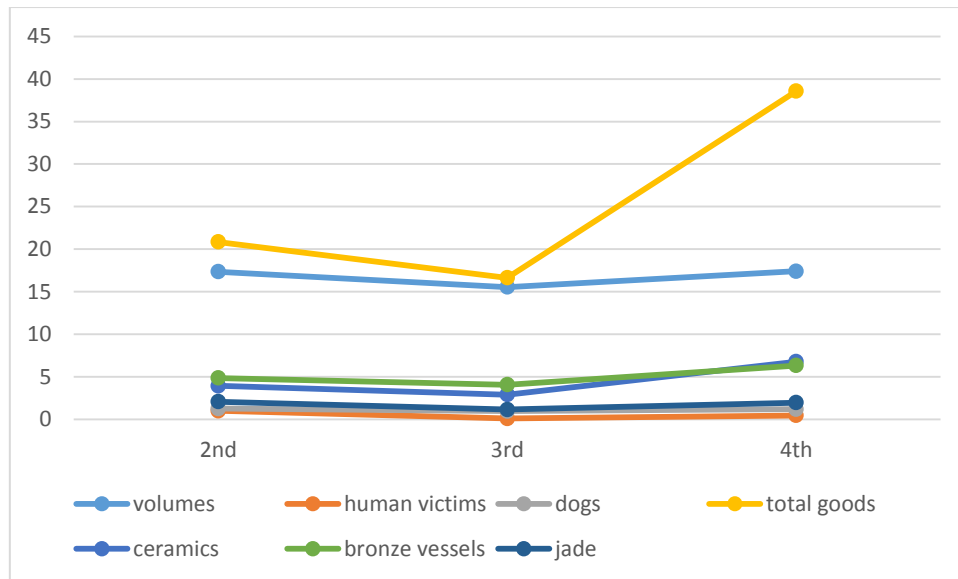


Chart 7.9 Elite tombs (n=109): mean numbers of other variables from phases 2 to 4

In comparison, data from the Guojiazhuang cemetery reveals slightly different patterns. I have removed the variables of human sacrifices (n=1) and jade weapons (n=0), as their numbers are too few. The number of bronze weapons fluctuated and peaked in the 3rd phase (Chart 8.10).³⁹³ Yet, both mean numbers of weapons and percentages of tombs with weapons declined sharply in the 3rd and 4th phases (Chart 8.11). This correlates with the trend observed in elite tombs that individual tombs of later phases had more weapons. With regards to other variables in the Guojiazhuang tombs, while tomb volumes remained consistent, quantities of burial goods, ceramics, bronze vessels (despite a minor fluctuation during phase 3) and jade objects grew (Table 7.3 and Chart 7.12). The numbers of sacrificial dogs declined.

³⁹³ There are no jade weapons in the Guojiazhuang cemetery (Database IV).

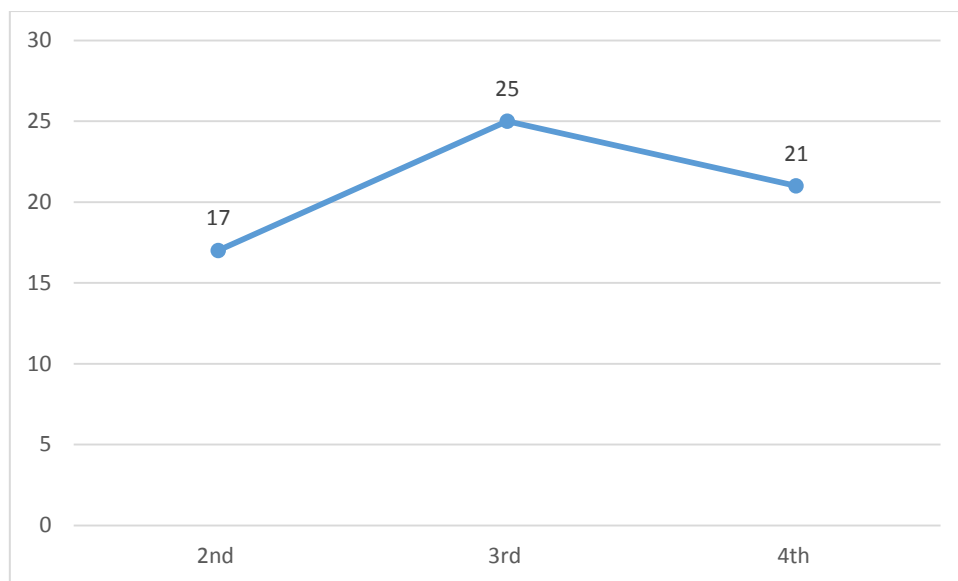


Chart 7.10 Guojiazhuang cemetery (n=85): quantities of bronze weapons from phases 2 to 4

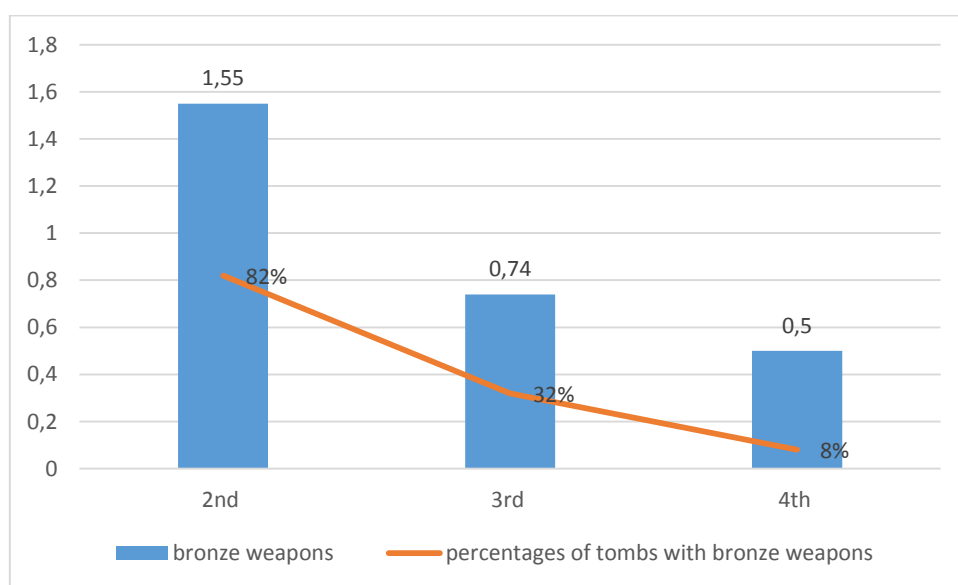


Chart 7.11 Guojiazhuang cemetery (n=85): mean numbers of bronze weapons and percentages of tombs buried with bronze weapons from phases 2 to 4

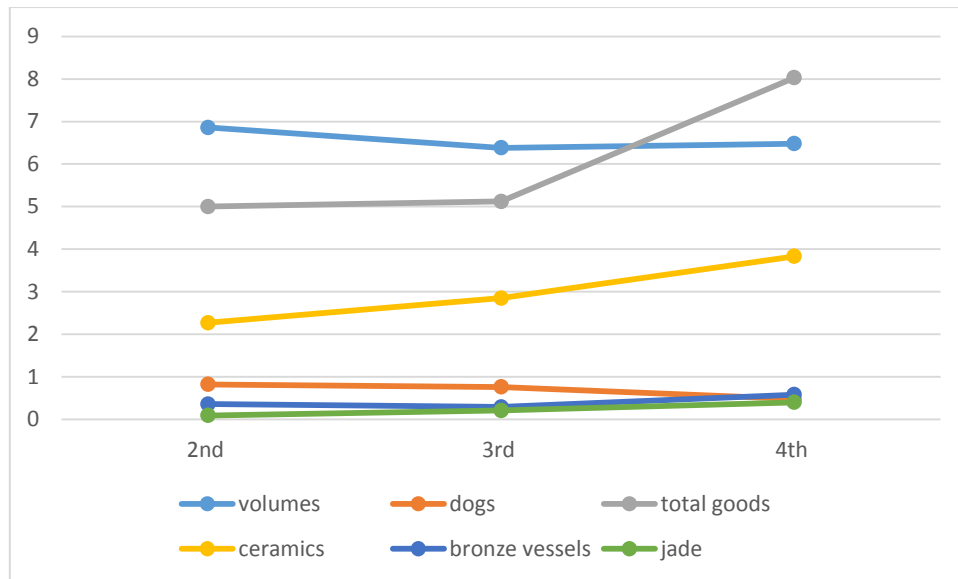


Chart 8.12 Guojiazhuang cemetery (n=85): mean numbers of other variables from phases 2 to

4

In summary, several patterns can be observed from the datasets of both the elite and Guojiazhuang lineage tombs from the early to the later phases: while tomb sizes remained consistent, there was an overall growth of burial goods in tombs; fewer tombs had weapons but more weapons were interred in individual tombs. Curiously, these patterns contradict Campbell's work on diachronic development of mortuary practice at Anyang. Based on data from three excavated areas (Guojiazhuang, Xiqu and Liujiazhuang),³⁹⁴ he argued 'there were countervailing developments in Anyang burials with slight overall increases in tomb size even while there were small mean decreases in tomb-internal elaborations'.³⁹⁵ In particular, his results show a decline in weaponry numbers.³⁹⁶ He considered this change to be the result

³⁹⁴ Data from Liujiazhuang loci has not been published yet.

³⁹⁵ Campbell 2007, 260.

³⁹⁶ *Ibid*, Table 8.20, 259.

of ‘increasingly systematised and ascribed mortuary practice’.³⁹⁷ His argument appeared to be plausible. However, his dataset includes outliers, such as Xiaotun M5, Guojiazhuang M160 and Huayuanzhuang, which belonged to the 2nd or 3rd phase of the late Shang. The numbers of weapons in those three tombs were almost equal to all other elite tombs combined (760 vs 772). As mentioned earlier, this has an impact on the representativeness of the data, while no tombs of similar sizes were uncovered in the 4th phase. Based on patterns observed, there might be organisational/technological (e.g. bronze workshops becoming more specialised, see Chapter 7.1.2) and economic factors (more resources becoming available) in play. Yet the patterns observed from the above analysis indicate fewer tombs had weapons but those that did contained much higher quantities from early to later phases. This suggests a shift in the changing conceptions of weapons among the Shang people. More importantly, from the perspective of object biography, there must have been transformation in the use of weapons. It may have also related to the organisation and production modes in bronze workshops (Chapter 6.1.2). These changing of patterns imply that social changes took place that led certain individuals become more associated with weapons. I will discuss this further in Chapter 7.2.3.

7.1.3 Any associations?

Previous studies suggested that no strict order existed on the use of bronze weapons to mark the status of the deceased, based on comparisons of the quantities of bronze weapons and vessels.³⁹⁸ However, the analysis was carried out on a case by case basis, drawing upon a few

³⁹⁷ *Ibid*, 260.

³⁹⁸ Guo Yanli 2014.

examples, rather than as a study of all available data. Meanwhile, relationships between weapons and other variables, such as sets of drinking vessels, tomb volumes and human sacrifices, remain unknown. In this section, I will employ correlation tests to investigate whether numbers of weapons of various materials are related to other variables. The datasets are 118 complete elite tombs and 90 Guojiazhuang lineage tombs.³⁹⁹ IBM SPSS Statistics 2.0 software will be employed to carry out the tests.

There are a number of correlation tests in statistics that examine relationships between variables. The most common method is the Pearson Product-moment Correlation Coefficient that measures linear relationships and requires data to be interval or ratio and has normal distribution.⁴⁰⁰ The Shapiro-Wilk Normality test was applied to quantities of weapons from elite and Guojiazhuang lineage tombs and the results suggest neither have normal distribution (Table 7.4 and 7.5). Spearman's Rank Correlation Coefficient (nonparametric) has therefore chosen to perform the examination.

Results of the Spearman's Rank Correlation test of variables from 118 elite tombs are displayed in Table 7.6. Values between bronze weapon numbers and four variables (tomb volumes, Human sacrifices, bronze drinking vessel sets and jade objects) are all significant at the 0.01 level,⁴⁰¹ indicating strong linear correlations. Previous studies have shown that those

³⁹⁹ As discussed in Chapter 8.1.2, Xiaotun M5, Huayuanzhuang M54 and Guojiazhuang M160 were the largest complete tombs excavated at Anyang. Assemblages of burial goods in those three tombs exceed all other tomb combined. It is therefore necessary to exclude them in the correlation tests and they will be discussed separately in Chapter 8.2.

⁴⁰⁰ Field 2005.

⁴⁰¹ The correlation value is demonstrated by r (correlation coefficient) and lies between -1 and +1 and is employed to measure the size of an effect. For instance, +1 indicates a positive relationship, 0 suggests none and -1 means negative.

four elements are part of the controlled capitals that marked social positions of burials.⁴⁰² This implies that bronze weapons were one of the elements that marked the hierarchy of burials.

Slightly different patterns were observed regarding jade weapons in elite tombs. Relationships vary largely: there is a strong correlation (at the 0.01 level) of jade weapons with sacrificial dogs, bronze vessels, and sets of drinking vessels; with human sacrifices and bronze weapons, correlation significance is at the 0.05 level; no linear correlation with tomb volumes exists. This suggests that the interment of jade weapons was related to social positions of burials, but there are also other factors, e.g. economics and gender. This contradicts scholars' suggestions that jade weapons were personal armaments for Shang elites.⁴⁰³ Another thing to note is on the materials of jade weapons. As detailed in Chapter 7.2.1, the majority of jade in tombs was identified by naked eyes in archaeological reports, rather than rigorous mineralogical analysis. It is possible that some non-jade materials were intentionally/unconsciously employed as replacements for true jade. The complexity of jade weapons requires detailed study in their archaeological context and I will discuss it further in Chapter 8.2.1.3.

Correlation tests were also applied to 90 Guojiazhuang lineage tombs. As seen from Table 7.7, linear correlations are observed between quantities of bronze weapons and tomb volumes, numbers of sacrificial dogs, bronze vessels, jade, and sets of drinking vessels. One possibility is the number of elite tombs (n=9) in the Guojiazhuang cemetery.

⁴⁰² Tang Jigen 2004, 140; Campbell 2011, 249.

⁴⁰³ Rawson 2015.

In summary, the presence and numbers of weapons seem to be closely related to variables that mark the hierarchy of tombs. Though this does not help us understand the uses or purposes of placing weapons in tombs, the correlation tests confirmed the significance of weapons to both elites and lineage members in a ranked society. I will address the complexity of weaponry assemblages in tombs in the following sections.

7.1.4 Spatial arrangement

There has been some discussion on the use of space and the distribution of grave goods within tombs in general.⁴⁰⁴ Campbell's study divided late Shang tombs into four zones, or five for some larger tombs.⁴⁰⁵ Through a quantitative analysis of large datasets, he observed patterns in that categories of objects were placed in specific zones and a template was possibly followed. He then proposed that tombs were houses for the deceased- zone I (inside the coffin) was personal space; zone II (between the coffin and chamber) was for personal or prized possessions; zone III (outside the chamber, ledges or niches) existed between personal and public space; zone IV (backfilling, waist pits and ramps) was immediately to the outside and zone V (beyond the tomb) was the extended space.⁴⁰⁶ Coomber, in his study of identities reflected in mortuary data, criticised Campbell's 'housing' model.⁴⁰⁷ He pointed out that there is a lack of evidence to support those grave objects being personal belongings, and that multiple divisions of space were not observed in smaller tombs as most of them had no chambers and included other features (such as ledges and niches). Instead, Coomber

⁴⁰⁴ E.g. Flad 2001; Linduff 2006.

⁴⁰⁵ Campbell 2007.

⁴⁰⁶ Campbell 2007, 232-238.

⁴⁰⁷ As pointed out by Brück (2004, 309), this 'ownership' idea is a product of modern society, it does not necessarily apply to past societies.

approached the issue from a qualitative perspective. Using Guojiazhuang M50, a tomb with one coffin and chamber and a modest amount of grave goods, and two other tombs,⁴⁰⁸ he divided the space into two zones: inner coffin and outside.⁴⁰⁹ Coomber argued that there is ‘a shared division of space, but different patterns of grave goods internment’ and outside, where most bronzes were placed, was the key space for the construction of one aspect of the deceased’s identity. Though his approach is innovative, there are only three tombs from the same lineage cemetery in Coomber’s analysis. They were neither representative nor typical. For example, Guojiazhuang M160 is the 3rd largest tomb with over 400 items (see Appendix 2.3).

Nevertheless, Campbell’s and Coomber’s studies have revealed general patterns in the spatial arrangement of grave goods. I will explore it further by looking into spatial arrangements of bronze and jade weapons in tombs, using the 121 elite tombs as a dataset (Appendix 3). A preliminary survey shows a spatial pattern of bronze weapons that has never previously been observed. In general, bronze weapons were often placed between coffins and chambers in a few large tombs with substantial quantities of weapons (e.g.: Fuhao, Guojiazhuang M160, Huayuanzhuang M54 and Xiqu M1713); many were also found inside coffins around the bodies of the deceased (n=19 tombs) (Table 7.8). One example is 83 Sikong M663.⁴¹⁰ The tomb was a typical vertical rectangular pit with ledged platforms, one wooden coffin and chamber and one waist pit. While many objects were placed between the coffin and chamber, some bronze weapons were around the upper body. They include one dagger-axe near the

⁴⁰⁸ Zhongguo shehui kexueyuan kaogu yanjiusuo 1998.

⁴⁰⁹ Coomber 2011.

⁴¹⁰ Zhongguo shehui kexueyuan kaogu yanjiusuo Anyang gongzuodui 1988.

shoulder, one spearhead next to the chest, one dagger-axe and one spearhead near the arm, and one broad flat axe near the waist (Figure 7.2). Although it is problematic to assume a greater significance for objects closer to the (upper) body, the close proximity between the deceased and weapons should not be overlooked. However, one major issue arises.

While object locations were recorded in detail and mapped in profile drawings in published reports, due to the decay of coffins and chambers and other factors (e.g. flooding) in tombs, many objects were no longer in their original depositional locations.⁴¹¹ Weapons that were found around the deceased could have been placed on tops of either coffins or chambers and subsequently fell onto the body due to the deterioration and collapse of the wooden structures. Rarely can layouts of objects be reconstructed with confidence; such inferences are only possible when other evidence is present. Another example is Xiqu M613, a relatively well-preserved tomb.⁴¹² According to the profile drawing, most of the objects were found inside the coffin, except for three bronze dagger-axes which were between the coffin and chamber (see Figure 7.3). However, based on traces of organic materials, excavators suggested a completely different arrangement- the chamber was covered by coloured fabrics, on top of which a range of objects (bronzes, ceramics and stones) were placed, and then blanketed by a layer of straw mat.⁴¹³ Such an example is rare, not only because of the state of preservation, but also the detailed observations of the excavators and their skills at recording (see Chapter 5.1.3). Among the 121 elite tombs, some were not published in detail and others were not

⁴¹¹ Camphill noted that the Xiaomingtun and Xin'an Zhuang cemeteries were selected due to their detailed recordings during excavations, but the dataset is not yet published, see Camphill 2007, 237.

⁴¹² Zhongguo shehui kexueyuan kaogu yanjiusuo Anyang gongzuodui 1979.

⁴¹³ *Ibid*, 51-52.

available due to various reasons (e.g. Gaolouzhuang M8 and M9, suffered from flooding due to the high water level in the local area.)⁴¹⁴

In summary, the spatial arrangement of weapons shows some regular patterns. In some of the large tombs, weapons were placed between coffins and chamber walls; weapons were also found closely to the deceased's bodies in a number of tombs. While it is tempting to interpret the pattern as evidence of strong martial associations, the accuracy of object arrangements in tombs is in doubt. It would be speculative to make a conclusion based on current evidence.

7.2 A case study of Fuhao M5, Guojiazhuang M160 and Huayuanzhuang M54

In previous sections, I have assessed the presence and distribution of weapons of various types and materials in elite tombs and a lineage cemetery. Statistical calculations have revealed the prominence of weapons in burial practice among elites. To further understand any underlying patterns, a detailed analysis of weapons from M5, Guojiazhuang M160 and Huayuanzhuang M54 is needed. They are the three largest complete late Shang tombs ever excavated at Anyang (all over 70 m³ in volume) and each contained vast numbers of weapons. I will also reference Xibeigang M1004, which may have been a tomb of a Shang king. Although it has been looted multiple times, many weapons were recovered from the tomb. Data from these four tombs has been collected from original archaeological reports, including quantities of objects and their contextual information. In addition to lists of items in the database (Appendix 3), they are recorded in a report style with detailed descriptions (Appendix 2). Although those four tombs are unique among all complete tombs excavated at

⁴¹⁴ Zhou Dao and Liu Dongya 1963.

Anyang, they can be seen to represent many hundreds of large tombs that have been looted to some extent.⁴¹⁵

All three tombs are rectangular vertical pits with no ramps, one ledged platform and one waist pit. M5 also has two niches. They share the same furniture of a single coffin placed inside one chamber, and many human sacrifices and dogs interred in various locations. Although the excavators of M160 considered it to include chariot pits, they are actually unlikely to be connected, and we can conclude that none of the tombs contained any horse or chariot related finds.

7.2.1 Weaponry assemblage

The large numbers of bronze weapons in each of the three tombs were enough to equip a troop, but they were buried with an individual tomb occupant. There also existed a diversity in types and materials, as well as possible use. For example, in Huayuanzhuang M54, there were 881 arrowheads, seven broad flat axes, 78 spearheads, 73 dagger-axes and three hooked-head knives. For each individual weapon type, diverse styles are present, e.g. the 73 dagger-axes were divided into three groups of six variants by the excavators, based on differences in their tangs.⁴¹⁶ The diversity in weaponry assemblages suggest they might have different roles to perform. The following case studies of bronze broad flat axes, bronze spearheads, and jade weapons will illustrate the multifaceted functions weapons had.

⁴¹⁵ Driven by profits, the tomb plunders have always aimed at large tombs, in particular those with ramps. Guojiazhuang M160, Huayuanzhuang M54 and tomb of Fuhao are rare surviving examples, see Tang Jigen 2004.

⁴¹⁶ Zhonguo shehui kexueyuan kaogu yanjiusuo 2007, 145-153.

8.2.1.1 Bronze broad flat axes

Bronze broad flat axes have been found in sizable burials with rich assemblages at Zhengzhou, Panlongchen, Taixi, Subutun, Taiqinggong and Anyang, and in ‘hoards’ at Zhengzhou.⁴¹⁷ Many are inscribed and also intricately decorated. They have long attracted the attention of scholars and numerous studies have been devoted to their typology, function and significance. They have been generally considered as ritual objects that mark the military rank of the deceased as well as being implements for punishments.⁴¹⁸ Yet, little is discussed regarding their practical function as weapons and the reasons for their prestige status. A re-assessment of broad flat axes in archaeological and textual evidence is therefore needed, starting from a discussion of terminology. Rather than just focusing on the objects’ final resting places and speculating about their use, I will trace dynamic value and associations of broad flat axes through a biographic approach with the aids of statistical tools.⁴¹⁹

Defining the term

In Chinese literature, large flat axes with arc shaped blades are conventionally named ‘yue’ 钺 and categorised as weapons (for an example, see Figure 7.4); whereas small examples with elongated bodies and narrow blades are defined as tools (Figure 7.5). The earliest known use of the term *yue* appears in inscriptions on the bronze vessel ‘*guoji zibai pan*’ 虢季子白盤

⁴¹⁷ Zhongguo kexueyuan kaogu yanjiusuo Erlitou gongzuodui 1976; Hubeisheng wenwu kaogu yanjiusuo 2001; Zhongguo shehui kexueyuan kaogu yanjiusuo 1994.

⁴¹⁸ Lin Yun 1965; Chen Fangmei 1997; Yang Xizhang and Yang Baocheng 1986; Tang Jigen 2004; Liu Chen 2011.

⁴¹⁹ Bradley 1998.

(dish of Guoji Zibai), dating to the Western Zhou.⁴²⁰ Another term, ‘*qi*’ 戚 (axes), has also been adopted. It first appeared in several transmitted texts and was subsequently adopted by Northern Song dynasty (960- 1127 AD) antiquarians in their bronze catalogues.⁴²¹ Both names have been used interchangeably or even jointly (*qiyue* 戚钺) by archaeologists and researchers when naming axe-shaped objects. Since the terms *yue* and *qi* come from post-Shang texts, they have been embedded with cultural implications of later periods that may not necessarily apply to the Shang (on criticism of the terminology issue, see Chapter 2.2.1). It is problematic to continue using this term when studying Shang examples and may mislead our understanding of the objects. I will therefore adopt the term ‘broad flat axes’, a name derived from physical descriptions, in this thesis.

Considering that a broad variety of axe-like objects were named *yue* or *qi* in archaeological literature, it is necessary to identify their characteristics using metric data. Thus, the length and width of all excavated Shang bronze examples has been collected (n=44, see Appendix 5 Broad flat axes).⁴²² As seen from Chart 8.13, a scatterplot displays the length and width distributions of all broad flat axes and there are three outliers (circled). They all came from the Zhengzhou site and were described as *yue*-shaped objects in the report (Figure 7.6), as

⁴²⁰ The inscriptions read ‘賜用戊，用政蠻方’，meaning (I) granted (you) with *yue* to conquest petty groups.

⁴²¹ In *Xuanhe Bogutu* (Drawings of Antiquities during the Xuanhe period) 宣和博古圖, bronze axe-shaped objects were termed ‘*qi*’ and were classified with musical instruments and as dancing implements in the same volume, see Wang Fu c.1110.

⁴²² I have excluded unprovenanced pieces in museum collections. For a survey of them, see Xu Jian 2015. I have included artefacts from Erlitou as well because Shang broad flat axes were considered to develop from Erlitou pieces, which were the earliest known bronze examples, see Zhongguo shehui kexueyuan kaogu yanjiusuo Erlitou gongzuodui 2002. While most archaeological reports have lengths and widths of bronze axes, the report of the Gaocheng site only has lengths. In combining with scaled illustrations, I deducted their width, see Hebeisheng wenwu kaogu yanjiusuo 1985.

they are of much narrower width than other examples,⁴²³ They have therefore been excluded from the current discussion. Among the broad flat axes, though varying greatly in size, their lengths have strong associations with their widths ($r^2 = 0.839$) (Charter 8.14 with three outliers removed). This uniformity suggests a certain template being followed at the production stage. Though they may vary slightly in shape, similar features are observed: flat and broad bodies (width/length ratio being over $\frac{1}{2}$), axe head widening at the blade where it flares out, and tangs (rather than sockets) for shafting. They differ largely from the axe-tools, which have narrower blades with sockets at the end for shaft fittings (Figure 7.5).⁴²⁴ They also differ from the northern style axes which have long bodies with sockets on tangs (Figure 8.7). Thus, the term 'broad flat axe' adopted in this thesis is an accurate reflection of their physical features.

⁴²³ Henansheng wenwu kaogu yanjiusuo 2001.

⁴²⁴ It is uncertain why those objects are named axe-tools, as the way shafts are installed at the socketed ends suggest they have more in common with spades, rather than conventional axes where the shafts are parallel to the blades.

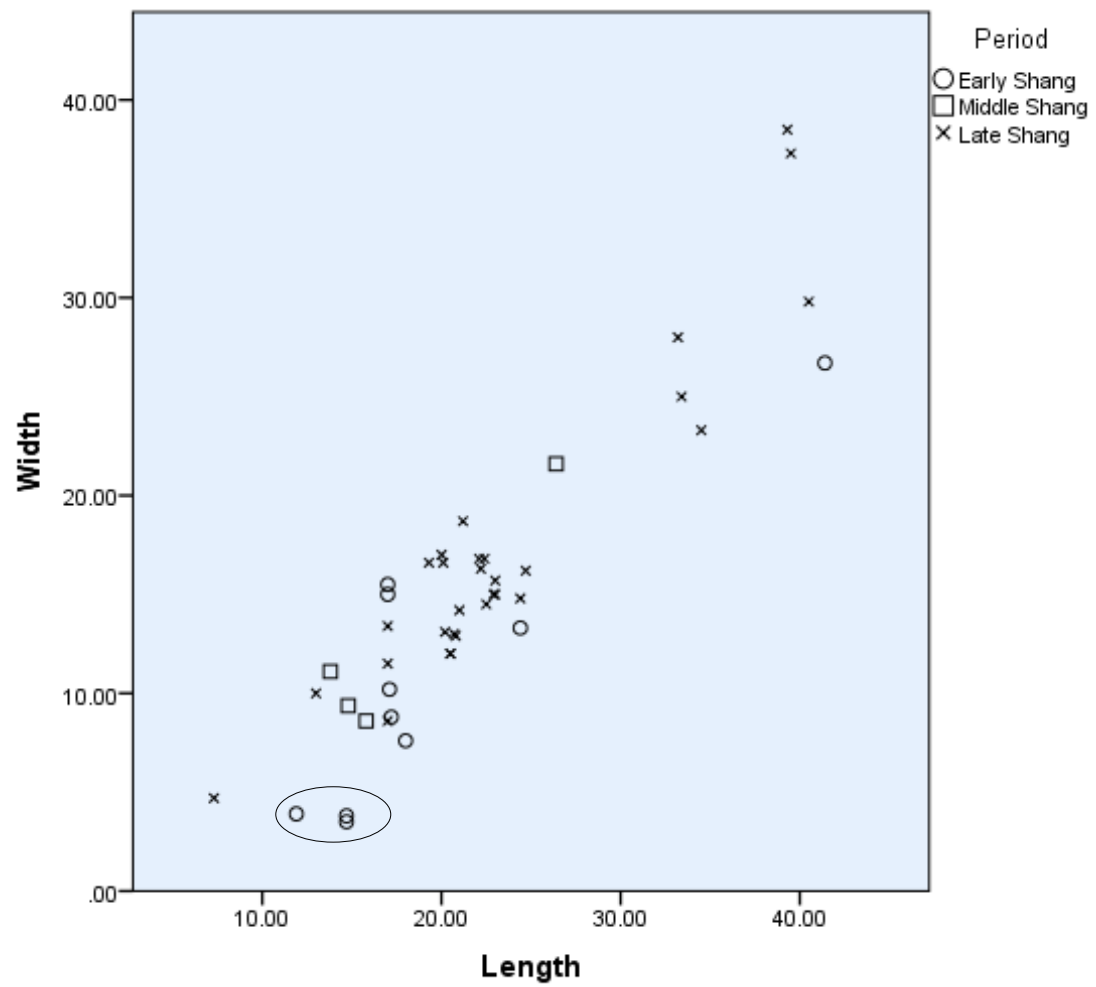


Chart 8.13 Distribution of broad flat axes' heights and weights with three outliers (n=44)

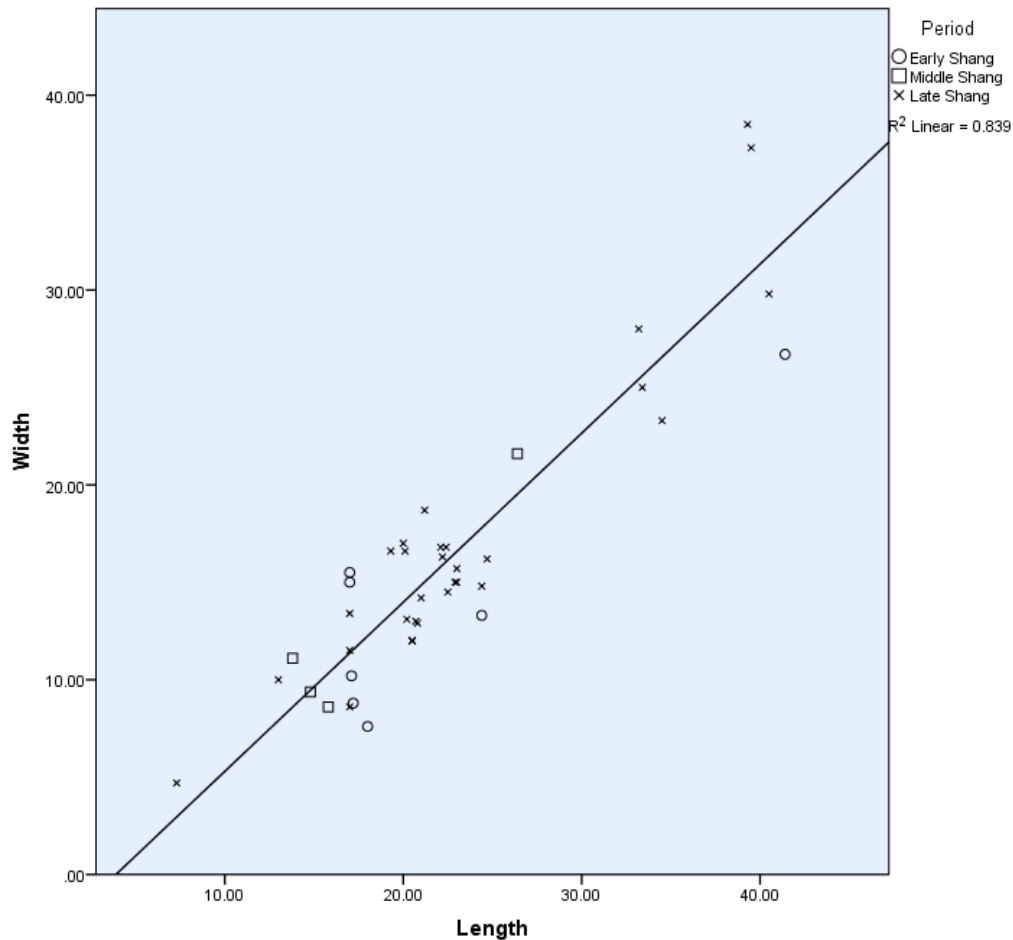


Chart 8.14 Distribution of broad flat axes' heights and weights (n=41)

Stylistic development

One popular research is tracing broad flat axes and axe-shaped objects (both jade and bronze) from a vast range of different cultures/sites of Neolithic to later periods to map out a linear sequence.⁴²⁵ One example is the attempt to find broad flat axes at the Erlitou site in order to fill gaps in the typological sequence to link the Neolithic and the Shang.⁴²⁶ Interpretations of

⁴²⁵ E.g. Chen Fangmei 1997; Yang Mei-li 1996; Liu Chen 2011.

⁴²⁶ A bronze *yue*-axe was found by villagers while building up houses at Erlitou site. Though it is incomplete and lack of stratigraphy evidence, it was reported as the earliest bronze *yue*-axe in China, see Zhongguo shehui kexueyuan kaogu yanjiusuo Erlitou gongzuodui 2002.

their social roles also followed similar trends. Chen Fangmei 陳芳妹 argued that the changing of materials from stone to jade and then bronze marked the transition of broad flat axes from common implements to exclusive ritual objects, in particular the Liangzhu jade ones as heralds of later Shang bronze pieces.⁴²⁷ Similarly, Bennett suggested that Liangzhu broad flat axes shared the same symbolic meaning representing leadership as the Erlitou and Shang bronze pieces.⁴²⁸ This approach is not just problematic in terms of the validity of sequences or interpretations, but also demonstrates an underlining principal reflecting the historiographic tradition of Chinese archaeology (see Chapter 5.1.2), that there was a continuous use of broad flat axes as symbols of power and military status spanning several millennia, and all within modern China's political borders. I would argue that the Shang broad flat axes were embedded with Neolithic heritage but developed their own use, value and significance. This heritage is two-fold. One facet is that the Shang elites adopted the form from Neolithic stone and jade pieces. The other is that this adoption was likely to have been a deliberate reference to the past.⁴²⁹ In contrast with Neolithic broad flat axes that were commonly made of stone and occasionally jade, and occurred in a wide range of contexts, as observed by Li Yung-ti at the Liangzhu site,⁴³⁰ Shang pieces were almost exclusively made of bronze and jade, of large size with elaborate decoration, and found in sizeable burials or

⁴²⁷ Chen's study included a full survey of broad flat axes of various materials from Neolithic to Warring States sites, in particular contexts of finds. Two patterns were noted by Chen Fangmei: the wide distribution of *yue*-axes in Neolithic sites to the concentration of bronze ones in the Anyang area during the late Shang; the inherent links in styles between Liangzhu *yue*-axes and Shang pieces.

⁴²⁸ Bennett 2007.

⁴²⁹ There are a number of examples suggesting the Shang was aware of the past. In Fuhao's tomb, there were some Neolithic jade, see Rawson 2002; Lü Jianchang 1996

⁴³⁰ Li Yung-ti (2007) observed that many Liangzhu large axes were made from rather plain materials and were probably still utilitarian implements.

‘hoards’.⁴³¹ It is likely that this broad flat axe form had become symbolic, adopted and employed by the Shang elites to differentiate themselves from ‘others’. I will discuss their function and significance further in the following section.

Function and significance

On the function and significance of broad flat axes, Lin Yun’s article is the most influential. He suggested that they represent military command authority and that the origins of the administrative authority of early kings in China might have developed from military leadership.⁴³² His main evidence derived from observing the similarity in form between the character ‘*wang*’ 王 (kings) in Shang oracle bone and bronze inscriptions and the shape of broad flat axes.⁴³³ Since then, this idea has been further developed by scholars. Drawing upon evidence from bronze inscriptions depicting broad flat axes beheading victims (Figure 8.8) and transmitted texts, Yang Xizhang and Yang Baocheng pointed out that broad flat axes were used as implements for punishment and were found exclusively in larger and richer tombs with sacrificial victims and existed in a wide range of sizes.⁴³⁴ Based on their sizes and contexts, Yang and Yang then suggested that quantities and sizes of broad flat axes in tombs corresponded directly to the political status and military power of the deceased.

These studies have greatly contributed to our knowledge of broad flat axes, yet there has been no real attempt to understand the existence of various sizes of broad flat axes. For example,

⁴³¹ Only one stone axe-blade was found in one Shang tomb, see ***.

⁴³² Lin Yun 1965.

⁴³³ Lin Yun (1965) also referenced military democracy in Rome and other societies in Marx and Engels’ works as supporting evidence.

⁴³⁴ Yang Xizhang and Yang Baocheng 1986.

of the seven broad flat axes found in Huayuanzhuang M54, M54:89 (length 40.5cm) is almost twice the size of the other six pieces (average length c.20cm). There has been a tendency to classify those axes into different sizes (e.g. large, medium and small), based on their length, though it is unclear what rationale has been used to separate medium and small sizes.⁴³⁵ Interpretations have then been proposed that size equated to military power or/and social significance. This is a rather intuitive interpretation and does not provide a satisfactory explanation regarding the various sizes of flat broad axes in single burial assemblages.

As shown in Chart 8.15, two broad clusters can be identified, based on the lengths and widths of published Shang broad flat axes. The first group has lengths less than 27cm and widths below 22cm. All of them weigh about 1kg or slightly less.⁴³⁶ The second group are all over 30cm in length and 23.3cm in width. They are also much heavier, ranging from 3.6kg to 9kg. The first group of broad flat axes were mostly uncovered from burials containing a modest number of objects, while the second group belonged to some of the largest and richest undisturbed Shang burials. As aforementioned, current interpretations do not explain assemblages of variously sized broad flat axes in the same burial. More importantly, too much attention has been paid to their ritual aspects because of the historiographic tradition. I consider broad flat axes of the first group to be practical, exclusive weapons that elites fought with and I will refer to them as ‘battle-axes’ (*zhanfu* 戰斧) in this thesis. The second group I will term ‘execution-axes’ (*xingfu* 刑斧). I will discuss battles-axes first, followed by an analysis of execution-axes.

⁴³⁵ E.g. Yang Xizhang and Yang Baocheng 1986.

⁴³⁶ This is based on weights that are provided in the reports, see Appendix 5 Broad flat axes.

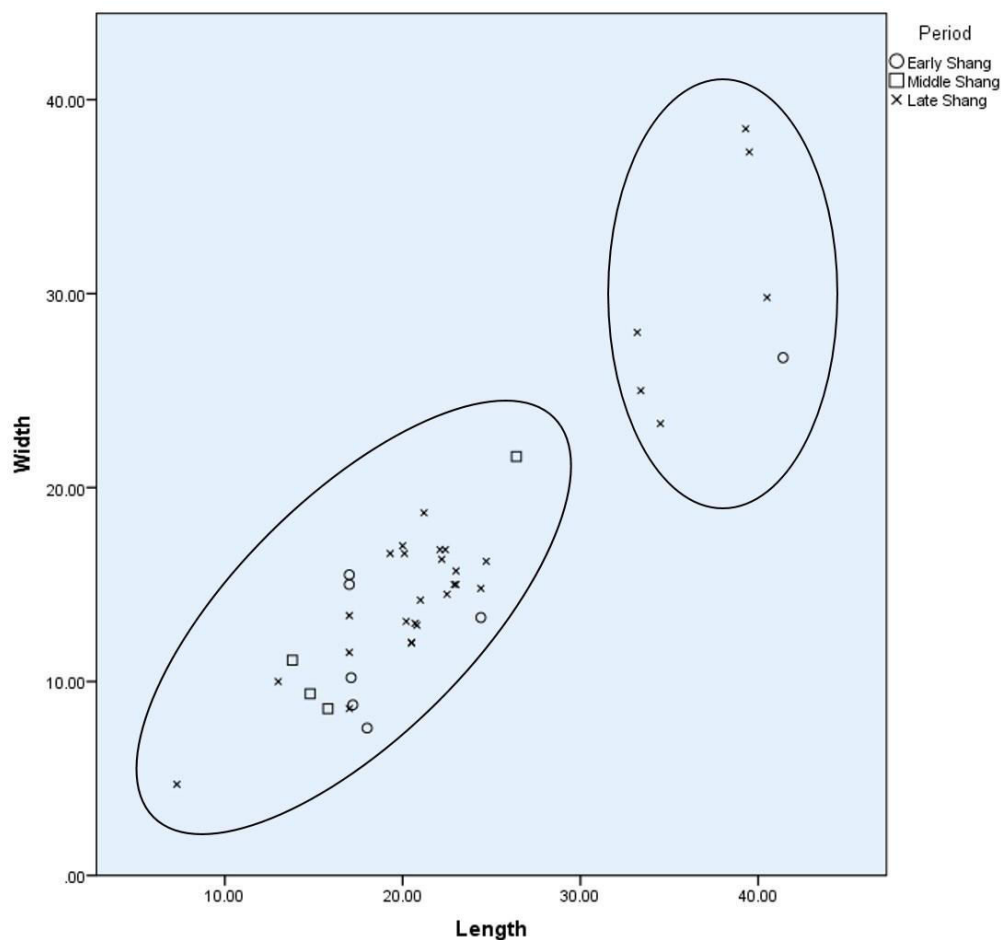


Chart 8.15 Distribution of broad flat axes in two Clusters

Battle-axes

Although broad flat axes have been commonly categorised as weapons in archaeological reports, it is unclear in current scholarly work whether they were practical fighting weapons or intended for rituals and/or display. A close observation of their occurrences suggests some patterns. They have been found exclusively in elite burials with quantities of weapons at Anyang (see Appendix 4). The majority were buried close to the deceased's body, suggesting an expression of intimate relationships. The layout of Dasikongcun M663 of the late Shang from Anyang can be illustrated here. As seen from Figure 8.2, a bronze flat axe (M663:33) was placed by the left side of the body and near the waist. It seems the deceased was holding

the axe in his left hand as his/her personal weapon. Unfortunately, the effectiveness of battle axes has never been attested through experiment archaeology, but wear and tear have been observed on some battle-axes.⁴³⁷

Meanwhile, ethnographic studies of Maori *patu*, which share similarities of form with Shang battle-axes, could provide supporting evidence for their lethality- fighting at close range and delivering blows and strikes with force.⁴³⁸ They were commonly made of stone or whalebone and a favourite choice for hand to hand combat, the form of fighting prevalent locally before the Europeans introduced firearms. Examples of *patu* in museum collections suggest that both those of stone and other materials have sharp and flat edges designed to deliver swift thrusts to an opponent's skull. This is supported by Taylor's examination of the skull of a Maori, possibly a warrior, that displays evidence of heavy blows to the jaw before he eventually died a few years later.⁴³⁹

Execution-axes

Execution-axes have been exclusively found in large tombs with the richest finds assemblages. Their physical characteristics, including sizes, colours,⁴⁴⁰ intricate decorations and inscriptions, would impress viewers. One example is M54:86 (Figure 8.4) from Huayuanzhuang M54.⁴⁴¹ On both sides of the tang, there are inscriptions reading 'yachang'

⁴³⁷ Liu Chen (2013, 63) mentioned the wear and tear observed on a number of battle-axes, e.g. Taixi M4:11, Sanjiazhuang M1:1; Louziwan M4:8; Yangjiawan M11:32, though he never carried out a full detailed metalwork wear analysis.

⁴³⁸ Taylor 1972.

⁴³⁹ *Ibid.*

⁴⁴⁰ On the discussion of colours of bronze weapons, see Chapter 8.3.

⁴⁴¹ Zhongguo shehui kexueyuan kaogu yanjiusuo 2007, 135-136.

surrounded by dragon-shaped motifs. Turquoises were embedded in between due to the width of those lines. There is also a hole in the lower part. The shoulders are rather square with two apertures on each side with a curving blade that is in the shape of an arc. On the upper body of the blade, it is mainly decorated with taotie 饕餮 (a mythical creature that is a common motif on Shang bronzes) with dragon and bird shaped patterns. It is believed that, due to the width of the lines, the inscription and dragon motifs were inlaid with turquoise. By comparison, other weapons in the same tomb are much less impressive. For instance, the spearheads in the same tomb are about half the length of M54:86 with no decoration, but inscriptions of ‘*yachang*’ or ‘*ya*’.⁴⁴²

As seen from some bronze inscriptions, those broad flat axes were depicted in beheading human sacrifices (Figure 7.8). In contrast to battle-axes, the weights of those execution-axes, shown in Table 7.9, would be heavy enough to deliver sufficient force for the act.⁴⁴³ Recent osteological studies of the remains of thousands of headless victims in the Xibeigang royal cemetery have confirmed that the beheading was carried out by sharp heavy implements, rather than by sawing.⁴⁴⁴

One thing to note is that the weights of those execution-axes vary considerably (Table 7.8 and Chart 7.16), though they are similar in length and width.⁴⁴⁵ In particular, M5:799 and 800 from the tomb of Fuhao are 9kg and 8.5kg respectively and others range from 3.6kg to 5.96kg. One question is: are those two axes too heavy to be used as execution implements?

⁴⁴² *Ibid*, 139-141.

⁴⁴³ R. Schulting, personal communication 12th September 2016.

⁴⁴⁴ Wolin et al. 2015.

⁴⁴⁵ Unfortunately, not all reports provide weights of objects.

As no metalwork wear analysis has been applied to them, nor has any experimental archaeology been carried out, further evidence is needed before making a deduction. One possible interpretation is that their large size and substantial weights are connected to Fuhao's royal consort status in relation to her participation in wars. Taken M5:799 as an example here, on the upper body, both sides were cast with a motif depicting two standing facing tigers with open mouths and in between a human head, and below one side was cast with inscriptions of 'fuhao'. This required a high level of craftsmanship at the production stage, and clearly the axe was tailor-made for Fuhao.

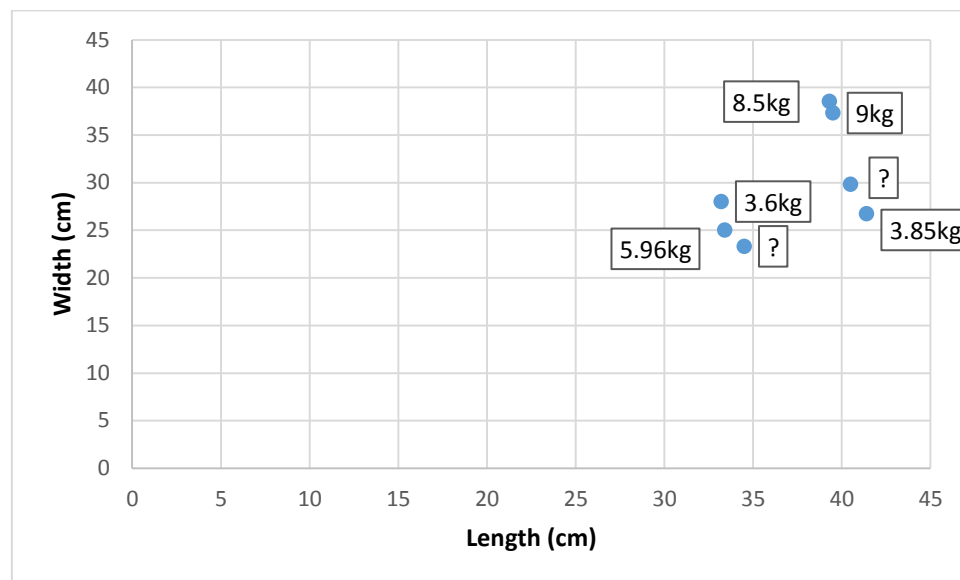


Chart 7.16 Execution-axes: distribution of height, width and weight

Furthermore, the interpretation of those axes as beheading implements do not necessarily mean the deceased were executors, as objects interred in tombs do not necessarily belong to the deceased or have a direct link to the occupant's status, wealth, career or power.⁴⁴⁶ Some

⁴⁴⁶ Thomas 1991; Pearson 2003.

bronze inscriptions provide possible evidence on the question of execution performers. A survey of Shang bronze inscriptions shows a total of 51 bronzes with depictions of broad flat axes.⁴⁴⁷ Among them, about one third of the inscriptions depict the use of broad flat axes as execution implements (Figure 8.9). Another one third have the addition of ancestor names. One example to be illustrated here is an inscription from a bronze vessel *you* 卣 (Figure 8.10), reading:

‘乍（作）父乙寶彝△’.⁴⁴⁸

‘Treasured vessel made for father *Yi* △’.

‘△’ (used hereafter to represent this character) is the pictographic depiction of a broad flat axe beheading a victim (Figure 8.9). On the types of those bronzes bearing △, all were cast on drinking or food vessels, except one on a broad flat axe.⁴⁴⁹ This brings us to the question of the meaning of △. Historians’ studies of bronze inscriptions suggested that △ was a lineage insignia.⁴⁵⁰ Though a number of excavated bronzes have △, no lineage cemetery containing △ has been identified at any Shang sites.⁴⁵¹ As △ depicts the act of execution, does this suggest this lineage was associated with the beheading industry or a provider of professional

⁴⁴⁷ Institute of History and Philology Academia Sinica 2009.

⁴⁴⁸ This vessel is dated to either the late Shang or early Western Zhou. Information obtained from the Digital Archives of Bronze Images and Inscriptions, Institute of History and Philology Academia Sinica: <https://app.sinica.edu.tw/bronze/rubbing.php?05204> (accessed 10th November 2015).

⁴⁴⁹ Li Xueqin and Sarah Allan 1995, catalogue number 59.

⁴⁵⁰ He Jingcheng (2009, 15-18) developed six criteria to assess if a character is a lineage insignia: used as lineage names in oracle bone inscriptions; multiple occurrences in bronzes from tombs of different periods in the same cemetery; multiple occurrences on bronzes that belonged to different generations in hoards; contextual uses in sentences in multiple bronze inscriptions; individual appearances on bronzes in association with other bronze inscriptions; relevant locations on bronzes.

⁴⁵¹ *Ibid*, 390.

executioners for Shang kings? While there is some evidence of divisions of labour among lineages,⁴⁵² further research is needed for its interpretation.

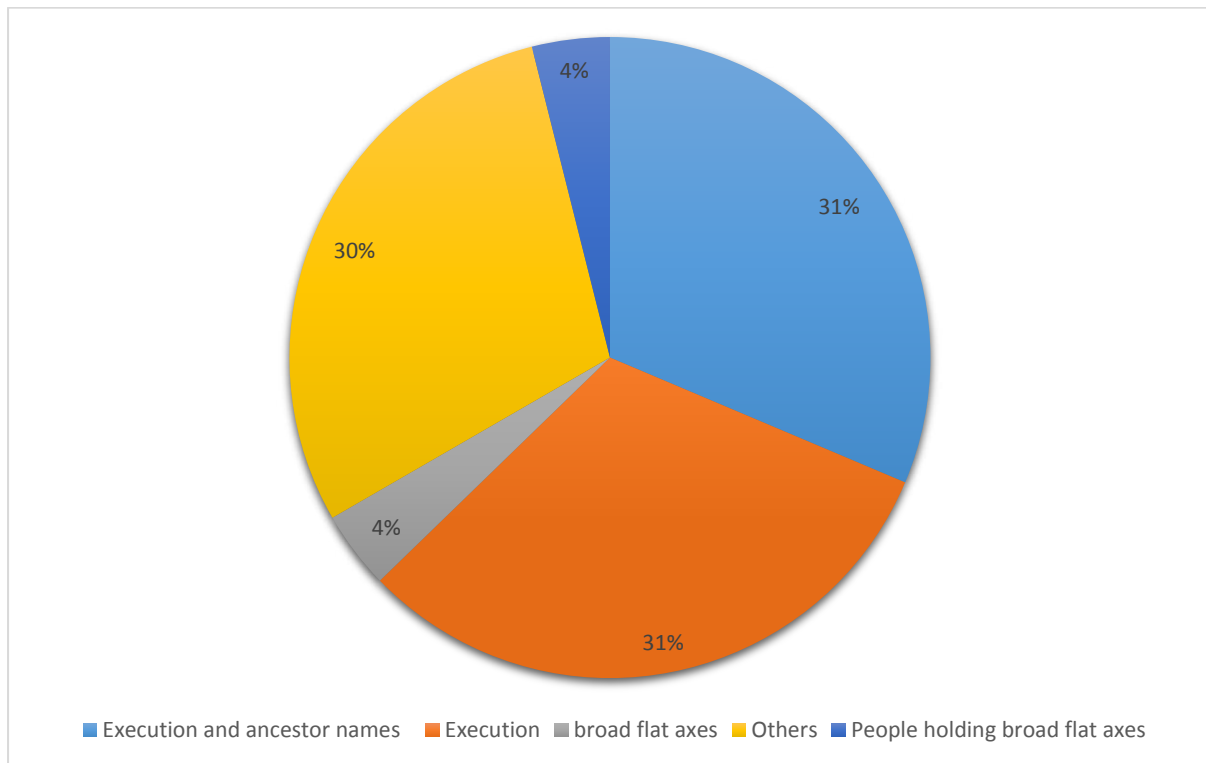


Chart 8.16 Various types of depictions of broad flat axes in bronze inscriptions

Summary

In tracing various attributes and events broad flat axes might have experienced, it is possible to conclude broad flat axes were prestige weapons for the Shang elites. Some of them were employed as battle-axes, exclusive weapons for elites to fight with and for display- their significance being that they combined strength with a unique form that referenced the distant

⁴⁵² *Ibid*, 234-235.

past. Others were used for executions, representing command and authority as well as the ability to punish and inflict legitimised violence upon others.

8.2.1.2 Bronze spearheads

While a wide range of weapons were present in the tomb of Fuhao, a comparison with weapons from Guojiazhuang M160 and Huayuanzhuang indicates the absence of bronze spearheads. Considering the quantities and quality of bronzes in Fuhao's tomb, the exclusion of spearheads in the assemblage posed a puzzle. A number of explanations have been proposed by scholars, yet no conclusion has reached. I proposed to consider it from an ontological perspective and argued it is likely to be a personal choice for the absence of spearheads in Fuhao's tomb.

Spears are attacking weapons consisting of a sharp point with a double-edged blade and a socket for the fitting of a wooden shaft.⁴⁵³ Remains of wooden shafts have been found in a number of Shang and Western Zhou tombs, suggesting a length of around 140cm.⁴⁵⁴ It is generally acknowledged that the Shang adopted spearheads from other areas, but the exact origins of Shang spearheads have been debated.⁴⁵⁵ Shen Rong proposed that the production of Shang spearheads in the Central Plains was influenced by both 'northern' and 'southern' traditions, based on typology, the methods of shaft attachment,⁴⁵⁶ and the context of finds.⁴⁵⁷

⁴⁵³ Little is known regarding the exact use of spears, such as thrusting or throwing.

⁴⁵⁴ Ma Dezhi etc. 1955.

⁴⁵⁵ Li Gang 2005; Shen Rong 1998; Li Jianmin 2001; Xu Jian 2015.

⁴⁵⁶ The 'southern' spearheads often have ears on either or both sides of the sockets and cords were possibly used to thread through to secure the shafts; spearheads found at Taixi and other sites in the north used nails in the sockets to secure the shafts. On reconstructing both ways of shaft fixing, see Shen Rong 1998, Figure 7, 460.

⁴⁵⁷ Shen Rong 1998.

In the south, spearheads were first found at Panlongcheng in Hubei during the early Shang.⁴⁵⁸ The ‘northern’ origin is supported by various types of socketed implements from the north, such as socketed axes (see Figure 8.7). In addition, the spearheads first appeared in the Central Plains at Taixi, an extremely north site, during the middle Shang.⁴⁵⁹ The earliest known example in the Central Plains was found at Sanjiazhuangdong 三家莊東 loci, Anyang, late Shang.⁴⁶⁰

The spread of the use of spearheads by the Shang has often been interpreted the effectiveness of spears in battle. In contrast to dagger-axes, which are swinging weapons, spears are most efficient at stabbing. This enables the fighters to stay in close formation when equipped with spears.⁴⁶¹ Another possibility is that spears enabled fighters to deploy in multiple ranks. In order to understand the introduction and adoption of spears at Anyang, I will place them in the light of Renfrew’s ‘material engagement’, further developed by Malafouris and Gosden.⁴⁶² Using the example of a Mycenaean sword, Malafouris discussed the ways in which the employment of a sword has an impact on body and mind and indeed the formation of a Mycenaean identity.⁴⁶³ The introduction of spears to Anyang is certainly a result of interactions, e.g. wars, between the Shang and neighbouring groups. Following Malafouris’

⁴⁵⁸ Hubeisheng Wenwu Kaogu Yanjiusuo 2001. As spearheads were exclusively found in some of the richest tombs at Panlongcheng, Xu Jian (2015) considered that the lack of spearheads at early Shang sites (Zhengzhou and Yanshi) in the Central Plains might be the result of no sizable burials yet being uncovered. His argument is plausible, but the common presence of socketed tools (e.g. axes) at Panlongcheng suggests that the presence/absence of spearheads cannot be simply explained by the presence/absence of rich burials. Meanwhile, no socketed implements of any type are known from early Shang sites in the Central Plains.

⁴⁵⁹ Hebeisheng wenwu kaogu yanjiusuo 1985.

⁴⁶⁰ Zhongguo Shehui Kexueyuan Kaogu Yanjiusuo Anyang Gongzuodui 1983.

⁴⁶¹ Lorge (2012, 25-29) proposed the idea of open and close formation while discussing the use of martial dance and halberds, which I discussed it in Chapter 8.2.1.2.

⁴⁶² Renfrew 2001, 2004; Malafouris 2004, 2008; Gosden 2008.

⁴⁶³ Malafouris 2008.

argument, in order to use a spear as an efficient attacking weapon, a body movement very different from using a dagger-axe, a common Shang weapon, is required. When spears were first introduced to the Shang at Anyang, it was not just a new body choreography that required learning and practice from users, but it may also have been a marker of identity. Considering that the presence of spearheads is quite rare in the 2nd phase tombs of the late Shang,⁴⁶⁴ it is possible that spears were not widely adopted by the Shang at this stage. Therefore, the absence of spears from Fuhao's tomb is probably a deliberate individual choice.

8.2.1.3 *Jade weapons*

The inherent links between Shang jade weapons, Erlitou and the Neolithic have long been noted by scholars. The resemblance in forms has often led to scholars tracing a linear development of jade from the Neolithic to later periods with static views on their functions, meanings and associations. As seen from archaeological evidence, jade weapons have been almost exclusively found in large tombs with rich contents (Chapter 8.1). This suggests there existed a continuous appreciation of jade from earlier periods, but it is most likely that the Shang inherited the forms, but new meanings and values were generated and reinvented with some references to the past.⁴⁶⁵ In addition, the distinctiveness of jade as a material, as discussed in Chapter 7.2, would also play a part in its value. Correlation tests in Chapter 8.1.3.

⁴⁶⁴ Only three tombs out of 77 complete tombs with weapons contain bronze spearheads in the 2nd period, see Guo Yanli 2014.

⁴⁶⁵ In the catalogue of the Sir Joseph Hotung jade collection, Rawson (2002) outlined three Neolithic contributions to the later appreciation of jade in China: three principal jade categories; associations with physical and spiritual power; depositions as burial goods for continuity in the afterlife. However, it is unclear regarding the extent of how later periods inherited all three attributes, in particular the latter two. See also Gosden and Lock 1998.

reveal the complexity regarding jade weapons. Thus, in this section, I will use the case study of dagger-axes from the tomb of Fuhao in their archaeological contexts to explore their functions.

The jade dagger-axe (M5:850) in Fuhao's tomb is one of a number of jade weapons found at Anyang that feature inscriptions.⁴⁶⁶ It is incised with:

‘盧方 X 入戈五.’

A lord Lu X offered five dagger-axes.

Lu is the name of a *fang* 方 (neighbouring group) mentioned in oracle bone inscriptions.⁴⁶⁷ According to the inscriptions, the Shang (possibly a Shang king or even Fuhao herself) received five jade dagger-axes from the lord Lu. This inscribed jade dagger-axe is most likely to be one of the five pieces that are mentioned, and there are four others in the assemblage of similar shape and decoration but without inscriptions.⁴⁶⁸ On the meaning of the word 入 ‘*ru*’, though it is translated as ‘offer’, its exact meaning is obscure. The five dagger-axes could represent tributes, payments or gifts. In essence, the event of those five dagger-axes transferring from lord Lu to the Shang is commemorated through the medium of inscriptions on jade dagger-axes. They became witnesses and bearers of a relationship between the two parties. This life event would add significant value to those dagger-axes and may possibly have led to their inclusion as part of the assemblages in Fuhao's tomb. Meanwhile, the

⁴⁶⁶ Another known example is red-pigmented inscriptions on jade weapons from Xiaotun M18, see Zhongguo shehui kexueyuan kaogu yanjiusuo Anyang gongzuodui 1981.

⁴⁶⁷ Hu Houxuan 1955, no. 1947.

⁴⁶⁸ Zhongguo shehui kexueyuan kaogu yanjiusuo 1980.

prestige value of jade as a material and the military associations of dagger-axes do not just contribute but actively participate in forming this relationship. These five dagger-axes were no longer just weapons for burials because they were embedded with particular profiles at their production and life stages, and they acted as tokens between the Lu polity and the Shang for their military alliances in a Shang queen and general's tomb.

7.2.2 On the question of martial identity and military organization

7.2.2.1 *Was there a standing army?*

Bronze weapons have often been employed as the principal evidence for the reconstruction of military organisation.⁴⁶⁹ A common approach to interpreting a burial with weapons is to conclude that the deceased was a professional soldier serving in a standing army. One example is in Shi Zhangru's study of 'weapon sets', a model he deduced from observations of standard equipment for military personnel in the early 20th century in China.⁴⁷⁰ He considered weapons in a tomb to be sets of equipment for infantrymen, charioteers or archers which were linked to the users' military ranks and status.⁴⁷¹ There seems to have been a static view on the identity of the deceased from a martial perspective whenever weapons were present. This interpretation is very much based on the assumption that burial goods are direct reflections of

⁴⁶⁹ Shi Zhangru 1950; Chen Zhida 1989; Liu Yiman 2002, 2003.

⁴⁷⁰ Shi Zhangru 1950. The study of 'weapon sets' was further carried out by Liu Yiman 2002; Guo Peng 2004; Guo Yanli 2004.

⁴⁷¹ Shi Zhangru (1950) studied four late Shang tombs at Anyang, from which he identified six sets of weapons and their accessories through their relative burial positions in tombs. Based on the weights, materials and qualities of the weapons in those six sets, Shi argued they were intended for soldiers of various roles, such as the 2nd set (including one bow-shaped object, two arrowheads, one dagger-axe, one knife and a few accessories) belonging to an archer. His sample numbers were rather small as only four random tombs were selected. It is based on a bold assumption that military divisions (such as cavalry and infantry) existed and were equipped with different and distinct sets of weapons. It is possible that some people may have possessed specialised skills, such as chariot driving.

the deceased's life combined with modern perceptions of occupational roles. A similar approach has also been seen in European archaeological research. Tombs with weapons were often interpreted as warrior burials. However, recent research suggests that many of the supposed 'warrior burials' were not necessarily people who were capable of fighting. Combining a quantitative approach with physical anthropological data, the study carried out by Härke on early Anglo-Saxon weapon burials in England suggested that weapon burial practice was a 'symbolic act' with ethnic, social and perhaps ideological expressions, rather than a reflection of reality.⁴⁷²

Another common interpretation is the assumed connection between weapons and occupations. Although other categories of objects were present as burial goods, for example farming tools, they have never been considered in the same way as weapons in inferring the identity of the deceased. Similar approaches have been taken in Europe.⁴⁷³ As pointed out by Brück in her study of early Bronze Age burials in Ireland and Britain, this 'ownership' idea is a product of modern society, and it does not necessarily apply to past cultures.⁴⁷⁴ Thus, it is important to understand the limitations of mortuary data and use it with caution. In the case of Shang weapons, the ideology and belief systems of Shang mortuary practice should be taken into consideration as the majority of materials were recovered from tombs (see Chapter 3.2).

On the reconstruction of a professional Shang standing army with a formalised system of rank, the approach seems to derive from modern military organisations with centralised

⁴⁷² Härke 1990.

⁴⁷³ E.g. Arnold 1980, 84-90; Steuer 1968, 18-87; Werner 1968, 95-108, quoted in Härke 1990, 22-23.

⁴⁷⁴ Brück 2004, 309.

command structures and standing armies.⁴⁷⁵ The influence may also come from archaeological discoveries of later periods, e.g. the world-renowned Terracotta Army of the Qin dynasty, dating to the 3rd century B.C., a common phenomenon of historiographical orientation assuming the continuity of military practice (see Chapter 5.1.2). If such standing army did exist, using the Guojiazhuang cemetery as an example, this would mean that 24% of the whole population would have been military personnel; a level requiring the support of enormous resources. One comparison that can be used here is the ancient Roman Empire. At its height in the late 1st century AD, it has been estimated that the army consisted of 350,000 troops (including citizen legionaries and allied *auxiliaries*), which represents about 3.5% of the Empire's total population.⁴⁷⁶ Another comparison is soldiers in service in the 21st century. China has the largest standing army in the world but soldiers represent only 0.18% of the population. Ranked second in terms of quantity, the ratio of America's military population is 0.5%. With a 'military first' policy, North Korea has the highest ratio (5%) of active army personnel.⁴⁷⁷ It is unlikely the Shang would have the resources to support a standing army comprising 24% of the whole population.

Meanwhile, oracle bone inscriptions provided some insights on the constitution of fighting forces. In numerous military records, men were raised for campaigns, as well as being employed in a wide range of activities, from agricultural work to road building (see Chapter 2.4).⁴⁷⁸ With regard to the socio-political organisation of the late Shang, lineage groups have

⁴⁷⁵ Campbell 2007, 170.

⁴⁷⁶ Luttwak 1976, 16.

⁴⁷⁷ Hackett 2012.

⁴⁷⁸ Keightley 1999, 2012.

been considered to be constituent units of Shang society.⁴⁷⁹ It is then possible to conclude that they were the main military forces of the Shang when required.⁴⁸⁰ The fact that weapons are the third most frequent objects to be selected to be interred in Guojiazhuang lineage tombs after ceramics (90%) and cowries (47%), indicates the significance of weaponry and indeed warfare to lineage groups.

8.2.2.2 *Were they warriors?*

If we accept that there were no professional military personnel during the Shang, how do we designate the martial identity of those elites buried with large numbers of weapons? The large numbers and varieties of weapons interred in Huayuanzhuang M54, Guojiazhuang M160 and tomb of Fuhao (Appendix 2) have led scholars to speculate on the identities of the tomb occupants from a martial perspective. The most studied is Fuhao, royal consort of King Wuding. As her name appears multiple times in oracle bone inscriptions, referencing her leading campaigns, and as over 200 weapons were found in her tomb, Fuhao has been interpreted as a military commander or general.⁴⁸¹ In an analysis of Fuhao's tomb structure, contents and their spatial arrangements, Linduff suggested that Fuhao came from an alliance group that was of strategic importance to the Shang.⁴⁸² Cao Dingyun further suggested, using oracle bone inscriptions, that Fuhao came from the Zi 子 polity.⁴⁸³ Regarding tomb occupant of M54, based on large numbers of bronzes that have inscriptions of 'yachang' 亞長, it was

⁴⁷⁹ Tang Jigen 2004.

⁴⁸⁰ Cf. Campbell 2007.

⁴⁸¹ Zhongguo shehui kexueyuan kaogu yanjiusuo 1980.

⁴⁸² Linduff 1996.

⁴⁸³ Cao Dingyun 1989.

suggested to be the personal name of M54's main occupant.⁴⁸⁴ The tomb occupant of Guojiazhuang M160 was considered to be an elite with military power judging from the nature and composition of grave goods, such as large quantity of bronze vessels and weapons.⁴⁸⁵

Regarding M160 and M5, there is no survival of the skeletons. Only the human remains from M54 have undergone osteoarchaeological study, from which the occupant was identified as a male of about 35 years old at the time of death.⁴⁸⁶ Element analysis of human bones from M54 (tomb occupant and human sacrifices) using Inductively Coupled Plasma Mass Spectrometry (ICP-MS) suggested the existence of differing diet among them.⁴⁸⁷ Meat probably featured more frequently in Yachang's diet in comparison to the sacrificial victims in his tomb. Considering the elite status of Yachang as seen from grave goods and size, more regular or greater meat consumption might have been restricted to certain groups of people, which further implies that a meat diet and access to meat might have been status related. In a more recent study regarding Yachang's identity, He Yuning argued he may have a southern origin.⁴⁸⁸ The questions arise: could these tomb occupants be warriors? Why does modern literature often interpret them as military leaders?

⁴⁸⁴ Zhongguo shehui kexueyuan kaogu yanjiusuo 2007.

⁴⁸⁵ Zhongguo shehui kexueyuan kaogu yanjiusuo 1998.

⁴⁸⁶ Zhongguo shehui kexueyuan kaogu yanjiusuo 2007.

⁴⁸⁷ This is based on the ratio of Sr/Ca and Ba/Ca. Using chemical analysis of bones to interpret diet rests on three principles: composition of different chemical elements varies among different food; when food is consumed, human would absorb proportions of strontium, calcium and barium accordingly; over the years, absorption of strontium and barium from food would mainly deposit in bone. Zhao Chunyan 2009.

⁴⁸⁸ He Yuning 2013.

A literature review suggests that the term ‘warrior’ has been occasionally used as a label in scholarly work on Shang archaeology for those buried with weapons.⁴⁸⁹ However, there seems to be a lack of definition of the concept of ‘warrior’ in the Chinese language as well as in historical contexts. It has been translated as *zhanshi* 戰士 or *wushi* 武士⁴⁹⁰ in Chinese, but there has not been any further discussion of their implications, though the word is culturally embedded. In Europe, warrior burials are marked by the presence of weapons together with, sometimes but not always, drinking vessels, horse harnesses, wheeled vehicles, and bodily ornaments.⁴⁹¹ The concept has also been associated with males, masculine body types, martial prowess and certain bodily treatments.⁴⁹² More importantly, warriorhood was relational and dependent, and was an aspect of a particular stage in someone’s life, as noted by Bruno in her study of spears in Bronze Age Italy.⁴⁹³ There is also a long literary tradition. Warrior figures were numerous in classical mythology and texts, such as Achilles, one of the most celebrated heroes of Greek mythology (Figure 8.11). The imposition of a warrior identity onto Fuhao and other Shang elites seems to lack such a cultural and historical background.

Meanwhile, scholars have argued that martial prowess and the practice of hand-to-hand combat were not celebrated among Shang and Western Zhou elites, but instead the ability to

⁴⁸⁹ E.g. Zhu Fenghan 2013; Liu Li and Chen Xingcan 2012; Hu Baohua 2011; Tang Jigen 2004.

⁴⁹⁰ This same word is used for Japanese samurai as well.

⁴⁹¹ Though this approach has been criticised by scholars (e.g. Harke 1990), it is the concept and designation of warriors in the archaeological research in Europe I am interested in.

⁴⁹² Treherne 1995.

⁴⁹³ In reviewing previous studies of warrior identity in Europe, Bruno (2012, 66) suggested the warriors did not exist on their own but established and recognised individuals among themselves and with the society. Warrior identity is ‘individually felt and collectively shared’, see Vandkilde 2006, 396.

command and lead was lauded.⁴⁹⁴ From a literary perspective, there were also disparate traditions and depictions of heroes, as observed by Keightley in his detailed comparison between early China and Greece.⁴⁹⁵ Building upon those previous works, I will take the argument further from a weaponry perspective through a synthesis of contextual data and oracle bone inscriptions.

It is first necessary to clarify the context of textual evidence. As discussed in Chapter 5.2, oracle bone inscriptions are records of divinations and chiefly reflect the concerns of Shang kings and elites. Their nature and function restrict what they record, with personal skills or detailed accounts of combat unlikely to be featured. It has been noted that epic narrative does not seem to feature in the Chinese literary tradition.⁴⁹⁶ Wang C. H. proposed that it was during the early Zhou that a certain cultural heroism was established in poetry, the main form of literature, and subsequently adopted in later periods.⁴⁹⁷ The centre of this heroism is leadership and the right to rule. As the Zhou became the source of ritual, culture and legitimacy of later dynasties in Chinese history, it is no surprise that this literary practice was inherited and further developed. It would be inaccurate to project the Zhou and later literature traditions backwards onto the Shang. Thus, neither oracle bone inscriptions nor later literature traditions are helpful in understanding Shang elites' martial practice.

As members of lineages were the main fighting forces for the Shang (see Chapter 8.2.2.1), occupants of M160 and M54 were likely to have been led by elites of their lineages. To lead

⁴⁹⁴ Rawson 2015b. A similar argument was put forward by Ralph Sawyer (2011) based on descriptions of campaigns in oracle bone inscriptions.

⁴⁹⁵ Keightley 1993.

⁴⁹⁶ Hightower 1953; Prusek 1970; quoted in Wang C. H. 1975.

⁴⁹⁷ Wang analysed early poetries as well as historical background of the Zhou, see Wang C. H. 1975.

and command troops in combat, personal martial prowess and fighting skills would be essential requirements. Osteological examination of the bones of the occupant of M54 ('Yachang') suggests multiple injuries that were likely to have been caused by sharp instruments (Figure 7.12). Some of these injuries never healed and were possibly perimortem wounds.⁴⁹⁸ By combining the evidence, it is likely that Yachang was an active participant in combat, through which multiple injuries incurred and eventually led to his death.

From the archaeological evidence, Shang elites were equipped with various types of weapons that could be used for combat. Embedded with Neolithic heritage, broad flat axes of various sizes represent command, the ability to punish and legitimise violence upon others, and the martial skills of the elites (Chapter 8.2.1.1). There were also curved-spine and hooked-head knives in M160 and M54. Some of them (M54: 87, 88 & 94) were inscribed with personal names. Although considered to be ritual objects,⁴⁹⁹ and/or primarily ceremonial,⁵⁰⁰ they could also be practical weapons to inflict bodily harm. This is supported by metalwork wear analysis (see Chapter 6 and Appendix 1) on the same types of knives in the British Museum collection. Both curved-spine knife 1945,1017.189 and hooked-head knife 1981,1117.1 were grinded with sharp blades. A range of nicks and notches on the blades indicates that they had performed their practical functions as lethal implements.

In summary, in researching tombs with weapons, it would be far more constructive to explore the ways in which weapons were employed by the Shang, rather than trying to apply culturally loaded labels, such as 'warrior', or 'soldier', to the tomb's occupant. It is possible

⁴⁹⁸ Zhongguo shehui kexueyuan kaogu yanjiusuo 2007, 281-288.

⁴⁹⁹ E.g. Xu Jian 2015.

⁵⁰⁰ E.g. Rawson 2015.

that elites of the late Shang did fight as well as leading and commanding infantry forces. Their multiple roles were not just restricted to military participation, but many were also engaged in other duties, such as sacrifices and agricultural work, as evidenced from oracle bone inscriptions.⁵⁰¹ The large quantities and varieties of weapons in elite burials suggest that a martial cult was widely shared and celebrated. I would also argue that a trend of martial and military specialisation developed in the later phases of late Shang, as supported by chronological change of weapons in tombs (Chapter 8.1.2)

8.2.2.3 A remark on chariots

One thing to note here is over 100 chariots have been recovered at Anyang and many horse and chariot parts were found in elite tombs. The most common type is *gongxingqi* 弓形器 (bow-shaped objects).⁵⁰² Current evidence suggests they were introduced from the steppe.⁵⁰³ The earliest examples of chariots (M20 and M40) in China were found at Qiaobei 橋北 site, Shanxi 山西 province, dating to c.1200 B.C., cemeteries of a subordinate group of the Shang.⁵⁰⁴ Drawn by one or two horses, a Shang chariot is a two-wheeled (spoke type) vehicle with a box and driven by a charioteer (see Figure 7.13). The spoked wheels made chariots light weight and were central to their speed capacity.⁵⁰⁵ They were usually buried in ramps or individual pits that were associated with large tombs. However, all those tombs that had chariot pits were disturbed.

⁵⁰¹ Zhang Yachu 1986.

⁵⁰² Yue Zhanwei and Sun Ling 2013.

⁵⁰³ So far the earliest known chariots were dated to 2,000 B.C. at the Sintashta site of the steppe, on the borders of Eastern Europe and Central Asia, see Anthony 2007, 402.

⁵⁰⁴ Qiaobei kaogudui 2006.

⁵⁰⁵ Anthony 2007, 397.

Whether or not chariots were actively employed in warfare by the Shang has been hotly debated by scholars.⁵⁰⁶ Using oracle bone inscription evidence and the fact that weapons have been found in some chariot boxes, Keightley considered that chariots were used in warfare.⁵⁰⁷ Some Chinese scholars have drawn similar conclusions based on the evidence of oracle bone inscriptions. Others, however, have disagreed on the effectiveness of chariots in fighting.⁵⁰⁸ In the most recent comprehensive work on chariots in early China, Wu Hsiao-yun illustrated how chariots were fully integrated into the Shang ritual system and acted as symbols of prestige and status.⁵⁰⁹ Among all the chariots buried with weapons, 12 were found at Anyang, which represents 20% (about 60 in total) of all chariots excavated (see Appendix 6).⁵¹⁰ The relative number is certainly small, though the presence of weapons may not necessarily indicate the functions of chariots, since they could be used for display, parades, or hunting.

Meanwhile, little is mentioned in the oracle bone inscriptions regarding chariots in warfare. The inscription that supporting chariots being employed in warfare is:

丙申卜貞：肇馬左右中人三百。六月。(jiaguheji 5825)

⁵⁰⁶ E.g. Yang Hong 1985, 1988, 2000; Shi Zhangru 1970, 1987; Bagley 1999; Wu Hsiao-yun 2013.

⁵⁰⁷ Keightley 2012.

⁵⁰⁸ Wu Hsiao-yun 2013.

⁵⁰⁹ *Ibid.*

⁵¹⁰ Keightley 2012.

‘Making cracks on *bingshen* (day 33), divined: (we) will deploy (*zhao*) the Horse (-chariot officers) (*Ma*)- the left, right, and centre- 300 (of them). Sixth month.’⁵¹¹

This inscription together with another record are the only ones among thousands of inscriptions that mention chariots in relation to warfare.⁵¹² In addition, on the meaning of *ma* 馬, multiple interpretations have been proposed.⁵¹³ It could reference chariots, horses or horse-officers. Considering the rarity of the inscriptions and also the uncertain meaning of the character *ma*, the argument for the war use of chariots is less convincing.

On the other hand, some of the earliest chariots from Sintashta have provided parallels on how chariots could be possibly used in battle. Anthony convincingly argued the Sintashta chariots might have acted as mobile platforms to throw javelins.⁵¹⁴ His evidence was based on width comparison to Egyptian war chariots, associated finds of weapons, and the effectiveness of fighter-charioteers using javelins. In the Near East, e.g. Egypt, tomb paintings depict charioteers driving and shooting simultaneously with the aid of reins around their hips.⁵¹⁵ Encountering chariot using steppe groups in battle possibly stimulated the adoption of chariots by the Shang.⁵¹⁶ Further evidence is needed to infer the role of Shang chariots in combat.

⁵¹¹ Keightley 2012, 180.

⁵¹² It tells the capture of prisoners and two chariots, see *Xucun* 2.915, quoted in Keightley 2012, Note 49, 187.

⁵¹³ Wang Guimin 1983; Keightley 2012.

⁵¹⁴ Anthony 2007, 399-405.

⁵¹⁵ Littauer 1968.

⁵¹⁶ Wu Hsiao-yun 2013.

7.2.3 Masculinity, gender and weapons

There is a long tradition of associating weapons with males and masculinity. The recovery of Fuhao's tomb and the references in oracle bone inscriptions to her leading campaigns and participating in wars have generated numerous discussions regarding gender, military and status.⁵¹⁷ Some have considered that Shang women participated in wars, and that closely defined gender roles were not yet formed.⁵¹⁸ Others have argued that Fuhao was an exceptional case and it was mostly males who fought and were buried with weapons at Anyang.⁵¹⁹

Those studies have advanced our understanding of gender using evidence from the late Shang. However, there is a prevailing interpretation trend of considering Fuhao as a unique individual. As a royal consort with large numbers of weapons in her burial assemblage and textual records of her leading campaigns, she was cited frequently in research, in particular with regards to the participation of Shang women in warfare.⁵²⁰ Her status was attributed to her own ability, her maternal family background,⁵²¹ and her relationship with the king, with implications that she did not conform to social norms. This approach reflects an undermining perception that there existed the division of gender roles⁵²² in Shang society. It echoes the issues raised in an influential article on the subject of art history, entitled *Why have there*

⁵¹⁷ E.g. Linduff 2002, 2006; Guo Yanli 2014.

⁵¹⁸ Wang Ying 2004.

⁵¹⁹ Keightley 1999; Tang Jigen 2004; Campbell 2010.

⁵²⁰ Linduff 2002, 2003, 2006; Linduff and Sun Yan 2006; Nelson and Myriam 2002; Coomber 2011.

⁵²¹ Linduff 1996.

⁵²² Gender roles: what men and women actually do- their activity patterns, social relations and behaviours- in specific cultural settings, see Spector and Whelan 1989, 69-70.

*been no great women artists.*⁵²³ The biggest ‘problem’ lies in the question formulation of ‘women artists’, as the imbalance derives from social and cultural restrictions placed on women, rather than biological gender reflecting differing artistic ability. In the case of weapons research of the Shang, it would be dangerous to make assumptions and project modern gender roles onto Shang society.

Another underlying issue is the lack of anthropological sexing of skeletons. Much attention has been devoted to the construction of gender identity through material remains (not just weapons) from late Shang tombs.⁵²⁴ Wang Ying and Katheryn Linduff proposed that bone pins (female) and engraved bone blades (male) were gender markers at Anyang.⁵²⁵ However, many tombs were found with neither type of object and some tombs, such as Xibeigang M260, were found with both pins and blades.⁵²⁶ One innovative approach is Coomber’s PhD thesis, which used the performance theory to explore identity building during the Shang and Zhou.⁵²⁷ His argument that ‘gender was materialised and reified through a performance’ is convincing, yet four of out the five late Shang tombs he examined were categorised through assumptions of the occupant’s biological gender, rather than osteological studies.

Curiously enough, among a small number (n=76) of skeletons that were sexed in published reports,⁵²⁸ there are examples of women being buried with weapons. One example is 95-96

⁵²³ Coomber 2011.

⁵²⁴ Linduff 2002, 2003, 2006; Linduff and Sun Yan 2006; Nelson and Myriam 2002; Coomber 2011.

⁵²⁵ Wang Ying 1999; Linduff 2006.

⁵²⁶ Xu Jian 2015, 160. The report of Xibeigang M260, see Zhongguo shehui kexueyuan kaogu yanjiusuo 1987.

⁵²⁷ Coomber 2011.

⁵²⁸ Zhongguo shehui kexueyuan kaogu yanjiusuo Anyang gongzuodui 1979; Tang Jigen 2004. Among them, 26 from the Xiqu cemetery were published; other tombs were listed with limited information in Tang Jigen’s PhD thesis. Yuan Haibing’s PhD thesis (2010) analysed 341 skeletons from excavations of the Liujiazhuang

Liubei M9, dating to the 2nd phase of the late Shang. Although it was disturbed, the main occupant of the tomb was identified as female and was buried with one bronze dagger-axe.⁵²⁹ Another is Xibeigang M260. It was believed to be the burial place of ‘Muwu’ 母戊 (mother Wu), the mother of a Shang king.⁵³⁰ Although looted on six occasions, many weapons (36 bronze arrowheads, 13 bronze dagger-axes, one jade dagger-axe, one jade arrowhead, 251 bone arrowheads) were found. There is also one complete tomb example XAM125 from Tang Jigen’s study. Unfortunately, excavation reports of this tomb have not published and only limited information has been provided in Tang’s thesis.⁵³¹ Considering that the sample number is rather small (n=76) among over 10,000 tombs excavated at Anyang, it would be rather hasty to infer relationships between gender and weapons, or deduce further on the issue of whether Shang women participated in wars.⁵³² Nevertheless, the few known cases of women buried with weapons suggest the presumed gender-weaponry correlation needs to be reassessed. Rather than looking for an established rule, more osteological analysis of skeletons is required to facilitate further research.

cemetery in 1998, 1999 and 2008, and 296 examples from Dasikong site in 1998, 2002, 2004 and 2008. Unfortunately, both sites’ excavations have not been published yet, except three tombs (2000-2001 Liujiazhuang M70 and M220, and 2008 Liujiazhuang M508). However, skeletons of those tombs were not studied in Yuan Haibing’s thesis due to poor states of preservation. Report of 2008 Liujiazhuang M508, see Zhongguo shehui kexueyuan kaogu yanjiusuo Anyang gongzuodui 2009. Report of 2000-2001 Liujiazhuang M70 and M220, see Zhongguo shehui kexueyuan kaogu yanjiusuo Anyang gongzuodui 2012.

⁵²⁹ Anyangshi wenwu gongzuodui 1997.

⁵³⁰ Zhongguo shehui kexueyuan kaogu yanjiusuo Anyangdui 1987.

⁵³¹ It is unclear this female was buried with one bronze dagger-axe or arrowhead, as Table 7.2 (Tang Jigen 2004, 329-330) and Figure 5.2 (*ibid*, 352) in Tang Jigen’s thesis provide inconsistent information.

⁵³² Following Tang Jigen’s study, Campbell (2007) considered that weapons were exclusively for males in tombs.

7.3 The phenomenon of thin and lightweight weapons in burials

Some thin and fragile weapons found in late Shang tombs have long been noted. They have been generally termed ‘*mingqi*’ 明/冥器 (goods for tombs) in archaeological reports and research, together with some bronze and ceramic vessels that were also of poor quality.⁵³³ Though widely applied, the term is rather problematic, as it was adopted from *Xunzi* 荀子 to describe objects produced especially for burials centuries after the period under discussion.⁵³⁴ While most research has concentrated on bronze and ceramic vessels,⁵³⁵ weapons have also been discussed in more recent works.⁵³⁶ Many explanations have been proposed, such as an inability to afford real objects, political reform, changing attitudes of using resources, and/or late Shang people beginning to show disrespect and doubting ancestors and gods.⁵³⁷ While some of these are feasible, the latter theory is based largely on transmitted texts of later periods. They were compiled several centuries or more after the Shang, and their validity as source of evidence for the study of earlier periods must be questioned (see Chapter 5.1.2). Some texts were written by the Zhou who conquered the Shang in around 1050 B.C. It is no surprise that the Shang were described in Zhou texts as being drunken and ruthless, eventually losing the blessing of heaven, which justified the Zhou’s right to rule. One proposal is that systemised offerings were made in the later period of the late Shang to replace sporadic and irregular offerings, based on an analysis of ritual related activities

⁵³³ E.g. Zhongguo shehui kexueyuan kaogu yanjiusuo 1998.

⁵³⁴ *Xunzi* is a collection of philosophical writings attributed to Xun Kuang (lived in the 3rd century BC). He is also known as Xunzi, thinker and philosopher of the Warring States period. An English translation of Xunzi, see Watson 1963.

⁵³⁵ Falkenhausen 2006; He Yuling 2006; Yang Xizhang and Yang Baocheng 1985; Liu Yiman 1995; Gao Xiangping 2010.

⁵³⁶ Liu Yiman 2002; Guo Yanli 2006.

⁵³⁷ Liu Yiman 1995; He Yuling 2006; Gao Xiangping 2010.

through inscriptions on oracle bones (numbers found, the frequency of divinations and contents) and burial assemblages.⁵³⁸ All of the above proposed interpretations have contributed to our understanding of this wide phenomenon in late Shang tombs, but the diversity of weaponry styles in tombs suggests there might be other explanations. Following the object biography approach, I will start the analysis of their production.

On chemical analyses carried out on some of the thin and lightweight weapons, the results show they are copper alloy with high lead content and some of them have up to 45% lead (see Appendix 4). Metallurgical studies indicate that having more lead in the composition would lower the smelting temperature and add fluidity to the molten metal,⁵³⁹ which made the moulding process easier. On the other hand, a relatively high tin content would provide hardness and ductility, in contrast with the brittleness of copper-lead pieces. In addition, different ratios do not only affect the physical quality of products, but also colour and glossiness. Notably, metallurgical studies suggest that craftsmen of the late Shang had mastered bronze casting techniques and were capable of manipulating the ratios of copper, tin and lead for their purposes.⁵⁴⁰ So, if the composition of the alloy is managed, are there any other patterns forged at the production stage (Chapter 7)? What was the intention underlying the production of weapons too thin and fragile for fighting? I will use dagger-axes, the most common weapons of the Shang, as a case study.

Typological studies indicate that diverse varieties existed among dagger-axes and there were five major types (Figure 2.9). For example, Huayuzhuang M54 contained three types with

⁵³⁸ Campbell 2007.

⁵³⁹ Jin Zhengyao 2000.

⁵⁴⁰ Zhongguo shehui kexueyuan kaogu yanjiusuo shiyanshi 1982; Li Minsheng et al. 1984; Ji Lianqi 1997.

seven subtypes among 73 dagger-axes.⁵⁴¹ In order to identify thin and lightweight items among the various types, metric data has been collected. Due to various factors (see Chapter 5.1), only 209 dagger-axes from ten tombs have had their lengths and weights published. These metric data have been compiled from individual reports and entered into an excel spreadsheet (see Appendix 5). Chart 8.17 displays the distributions of various types by length and weight. Some notable patterns have emerged with types I, II, IV and V almost forming a cluster despite their diversity of form,⁵⁴² while style III (including A, B and C sub-groups) shows much diversity. Type III dagger-axes represent some of the longest pieces and also some of the lightest. For instance, one dagger-axe (M5:741) is 39cm long, whereas the median length of dagger-axes of other types is around 25cm long. Many type III dagger-axes were described in archaeological reports as light and thin, and considered to be goods made for burial. Is it a coincidence that those dagger-axes were exclusively type III? This pattern has been observed by several scholars,⁵⁴³ but so far no further explanation or interpretation has been provided. Following the object biographical approach, I argue that type III forms were purposefully chosen for manufacturing those thin and lightweight dagger-axes, which possessed unique symbolic significance to the Shang. Before they were interred in tombs, they were probably employed in display, parade and martial dances for combat practice and performances in ceremonial settings, as discussed below.

⁵⁴¹ Zhongguo shehui kexueyuan kaogu yanjiusuo 2007.

⁵⁴² Unfortunately, only one data set of type II dagger-axe is available from Huayuanzhaung M54, see Zhongguo shehui kexueyuan kaogu yanjiusuo 2007.

⁵⁴³ E.g. Guo Yanli 2006, 2014.

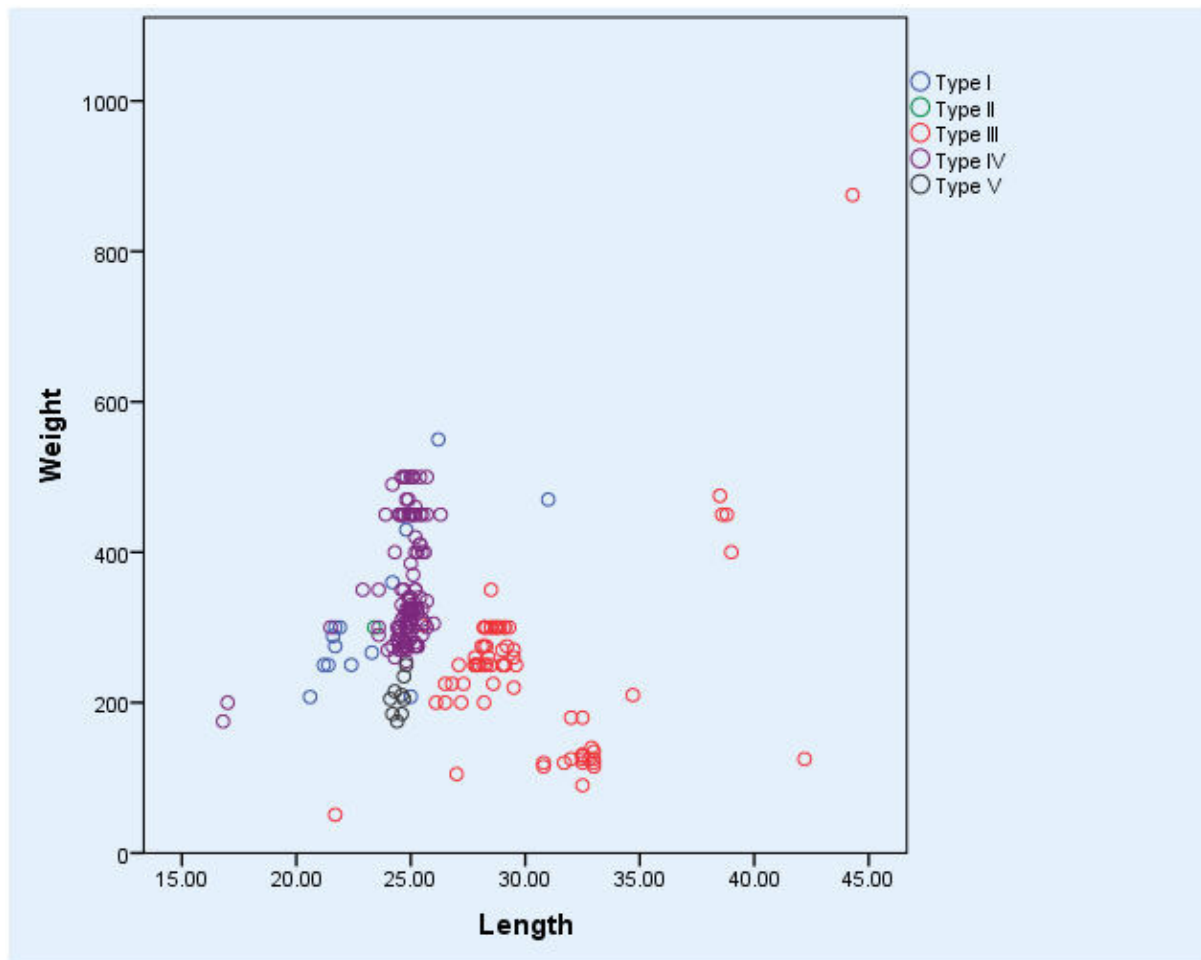


Chart 8.17 Distribution of dagger-axes' lengths and weights by types (n=213)

Several trends can be observed regarding type III dagger-axes. First of all, their styles remained consistent and were present throughout the late Shang. On the other hand, there is an overall development regarding improvements in hafting among types I, II, IV and V.⁵⁴⁴ More importantly, from a typological perspective, type III (Figure 2.9.3, 2.9.4 and 2.9.5) evolved directly from archaic Erlitou pieces (see Figure 7.14). Many of the Shang type III were elaborately decorated with turquoise on the tang. Some are exceptionally large and

⁵⁴⁴ Jing Zhongwei 2011.

heavy, for example M5:740 from Fuhao's tomb is 38.5cm long and 475g in weight. In addition, type III dagger-axes were often found in sets (5-18 pieces) that were similar in form, length and weight. For instance, Dasikong M303, a lower elite burial, contained 18 type III dagger-axes, which all are about 20cm long and 200g in weight. It is possible that they were produced *en masse* (see Chapter 7.1).

The high lead content of type III dagger-axes has often been considered from an economic perspective as a way of saving the tin by replacing it with lead.⁵⁴⁵ Meanwhile, the high lead content would also have an impact on the colour of finished products. Observations on a modern standard set show that lead-bronze would look shinier than tin-bronze.⁵⁴⁶ On a study of colour terms in oracle bone inscriptions, different symbolisms were associated with individual colours for ritual purposes and several inscriptions have employed the term ‘黄’ (yellow) as an adjective for bronzes.⁵⁴⁷ This suggests that the bright yellow colour was an important part of the materiality of bronzes and the colour gradients of various alloys may have played a part. It is possible that the higher lead content was not entirely an economic saving, but was purposefully added to achieve the golden shining colours that were desired.

From a functional perspective, the use of dagger-axes is not only limited to fighting in combat, but also in parades and inspections for display and performance purposes. In the case of type III dagger-axes, their bright golden-yellow colour, combined with their archaic forms, would look appealing and make a strong impression on viewers. One possibility is that they

⁵⁴⁵ The high lead in the alloy would also make the products less hard and more brittle.

⁵⁴⁶ There are other elements influencing the colour of finished products, such as temperature, see

⁵⁴⁷ Wang Tao 1996.

could have been employed in martial dances, an idea first proposed by Lorge.⁵⁴⁸ I find his discussions on the close links between martial dances and battle formation training useful, though his discussions were rather confusing. He noted that the earliest evidence of dance came from Warring States texts, but on a later page that dance was mentioned in Shang oracle bone inscriptions. He failed to reference the original sources for either of these.⁵⁴⁹ In the next page, he stated that dance is mentioned in Shang oracle bone inscriptions.⁵⁵⁰ However, neither of them were referenced to original sources. Furthermore, his argument on the employment of martial dances during the Zhou was not based on any textual or archaeological evidence, but resulted from a speculation that the Zhou infantry fought in close formation due to increasing use of halberds (weapons that combine spearheads and dagger-axes together). They can be employed for thrusting, stabbing and slashing. In contrast, the Shang probably fought in open formation due to the extra space required for swinging dagger-axes. Lorge then concluded that the Zhou must have employed martial dance in order to learn to fight in a co-ordinated manner. Though this deduction sounds plausible, it does not explain the presence of large numbers of spearheads in late Shang tombs, which were also suitable for close formation fighting (see Chapter 8.2.1.2).

The martial dance theory can be further supported by the presence of sound instruments-bronze *nao* 鐃 (cymbals) found in the same tombs with lightweight and thin weapons.⁵⁵¹ As discussed in Chapter 8.2.1.2, certain training is required to master the use of any types of weapons, and sounds were probably involved in martial dances for conveying signals and

⁵⁴⁸ Lorge 2012, 25-29.

⁵⁴⁹ *Ibid*, 26-27.

⁵⁵⁰ *Ibid*, 27.

⁵⁵¹ For a detailed study of music instruments found at Anyang, see Lai Celine 2010, 128-135.

instructions.⁵⁵² A survey has demonstrated the existence of a co-occurrence of cymbals with thin and lightweight weapons in tombs. As seen from Table 7.10, all 12 tombs from Anyang that had cymbals also yielded a number of bronze weapons, ranging between 11 and 249.⁵⁵³ Unfortunately, due to the limited information available in some archaeological reports, the types and characteristics of the bronze weapons in Xiqu M699, 58 Sikong M51 and Gaolouzhuang M8 remain unclear.⁵⁵⁴ The remainder of the tombs all had thin and lightweight type III dagger-axes, except Dasikong M312, which had 10 spearheads, all thin and lightweight, which equally could also be used in martial dance.⁵⁵⁵

An illustrative example is a set from Dasikong M303 (Figure 7.15).⁵⁵⁶ Most sets appear to have contained three cymbals of various sizes. They came almost exclusively from tombs with many bronzes.⁵⁵⁷ Their decorations were simple and plain. Several tonal tests have been carried out, and all came to the conclusion that the tune produced by those cymbals lacked the regularity required for musical performance. As noted by Lai Celine, the musical quality,

⁵⁵² Lorge (2012, 26-27) suggested music was played in martial dances in the Zhou period but did not provide any further evidence. Archaeological finds of large numbers of musical instruments in Zhou tombs could possibly support Lorge's argument. One of the most well-known finds came from the Marquis of Yi's tomb (c.433 B.C.) of the Zeng state in Hubei province, which included a full set of 64 bells. For the report of the tomb, see Hubeisheng chubanshe 1989. Musical instruments seem to have featured significantly in Zhou rituals, but evidence of their exact use in ceremonies mainly came from later transmitted texts, such as *Shi Jing* 詩經 (*The book of poetry*), see Lai Celine 2010, 159-161. Rawson (1990) argued that musical performance was intended for large audiences.

⁵⁵³ In Lai Celine's (2010, Table 3.1) study, 14 tombs from Anyang had cymbals, but three of the tombs (Xiqu M765, Dasikong M288 and Xibeigang M1083) are not fully published, except mentions of their cymbals in other works. I exclude them here as their assemblages are not known.

⁵⁵⁴ Xiqu M699 had a ramp and was looted, see Zhongguo shehui kexueyuan kaogu yanjiusuo Anyang gongzuodui 1979. 58 Sikong M51, see Henansheng wenhua ju wenwu gongzuodui 1958. Gao Louzhuang M8, see Zhou Dao and Liu Dongya 1963.

⁵⁵⁵ Ma Dezhi et al. 1951, 50-51. Though I have carried out the analysis using dagger-axes, other weapon types also have thin and lightweight examples. Some of them would share similar functions as dagger-axes.

⁵⁵⁶ Zhongguo shehui kexueyuan kaogu yanjiusuo Anyang gongzuodui 2008.

⁵⁵⁷ Tang Jigen 2004.

size and decoration of the Anyang cymbals suggests they probably did not feature prominently in ritual ceremonies.⁵⁵⁸ Yet, they were produced for sound making, and would have been perfect for signalling movement. One concern, however, is that if those cymbals were indeed for signalling, why did only a small number (n=11) of tombs include them? One explanation is that the ability to signal and direct troops using the sound of cymbals would indicate commands to some extent, hence they were exclusive items. Another fact is that almost all large tombs at Anyang were looted, hence there is a natural imbalance in the data we have (Chapter 5.1).

If martial dances formed part of a ritual ceremony, the performativity of martial dance could be a manifestation of martial skills, victory, discipline, social hierarchy and authority. The movement of the dagger-axes closely resembled what was required to fight in battles, which may in turn have served as a reminder of military prowess and previous glories. As their designs resemble Erlitou dagger-axes, their archaic forms would be easily recognised and a sense of connection to the past would be raised among audiences, and possibly commemorate historic victories that were celebrated by the Shang. The audiences were not necessarily restricted to the living, but also Di, spirits and ancestors, who sat at the top of the hierarchy. Performers would share similar experience. A martial dance performed by fighters was a way of showing competent skills in using dagger-axes or other weapons. More importantly, martial hegemony and the power of the leaders (which could include lineage leaders as well as kings) were enforced through the performance of martial dances. We could speculate on

⁵⁵⁸ Lai Celine 2010, 159. In her thesis, Lai (2010) argued the significance of bells (*nao* or *yongzhong*) to the southern societies, which suggested different ritual practices of using bronzes to the Shang.

the impression such dances would create among those who came from neighbouring groups, allies, subordinates or enemies.

7.4 The phenomenon of covering/wrapping weapons

Traces of mineralised textiles have been observed on many bronzes (both weapons and vessels), as mentioned in Chapter 6.4.4. There are also traces of mats and fabric on wooden coffins or chambers, suggesting fabrics were employed as part of the funeral process for either covering or wrapping. For example, in Qijiazhuangdong M269, five bronze spearheads were neatly stacked in the southwest corner of the wooden chamber, facing south.⁵⁵⁹ According to the way they appeared and fabric traces on the surfaces of the upper and lower spearheads, it has been suggested that they were wrapped in fabric when deposited. Similar treatments were also observed on three spearheads (M160: 260, 261 and 262) from Guojiazhuang M160.⁵⁶⁰ However, little has been discussed regarding the use of fabrics or mats in burials, either as wrapping or coverings, despite them being noted in archaeological reports. Interest has mostly centred on patterns of textiles in relation to the development of the Shang textile industry, such as the six varieties of textiles identified from their imprints on objects in Fuhao's tomb.⁵⁶¹

Although textile finds are easily overlooked as they are rare archaeological survivals, they potentially played an important role in burial processes. Were textiles purely functional divisions between the backfilling and objects? If so, perishable and fragile materials such as

⁵⁵⁹ Anyangshi wenwu gongzuodui 1991.

⁵⁶⁰ Zhongguo shehui kexueyuan kaogu yanjiusuo 1998, 110.

⁵⁶¹ Zhongguo shehui kexueyuan kaogu yanjiusuo 1980, 18; Zhongguo shehui kexueyuan kaogu yanjiusuo 1994, 414-5; Yu Weichao 1997, 140-141.

fabrics were probably not the best choices. Were there, then, any other intentions behind their use? Were all of the objects placed on top of the chamber and then covered by a layer of fabric/mats? In this scenario, all of the objects would be seen by those observing the burial first, then a separation created before the backfilling of the burial chamber. Alternatively, individual or groups of objects could have been wrapped beforehand and then deposited in tombs. If this was the case, they would have been concealed from viewers, and the vague shapes of wrapped objects could have generated speculation.

Similar to issues of object layouts in tombs, it is rather problematic to reconstruct the extent to which wrapping or covering took place, due to the organic nature of the materials (e.g. textiles and straw mats) involved and their often poor state of preservation. Nevertheless, covering and wrapping might have slightly different connotations, they are both a means to ‘conceal and reveal, camouflage or highlight, transform and exhibit, conserve and preserve’.⁵⁶² ‘Wrapping’ as part of mortuary practices have long been recorded in many societies of various periods. The objects of wrapping are not just confined to individual artefacts or groups of artefacts, but also bodies (e.g. Egyptian mummies), composites (e.g. tombs)⁵⁶³ and places/landscapes.⁵⁶⁴ Many forms of wrapping take place, e.g. covering, enclosing, containing and protecting. One common ground is that they serve to include all and forge multiple relationships among their contents inside. In this process, the importance of wrapping materials should also be taken into account, as they have properties and efficacy

⁵⁶² Harris and Douny 2014, 16.

⁵⁶³ One example is the Hochdorf tomb of southwest Germany, dating to the early Iron Age, known for its chamber, including all objects and the body, being completely covered with fabric, see Banck-Burgess 2014.

⁵⁶⁴ On a study of prehistoric petroglyphs in Rapa Nui (Easter Island), Croucher and Richards (2014) considered rock art as tattooing and wrapping of the landscape in constructing ‘living’ cosmology.

that act on their contents or the perception of their contents. Based on evidence of textile wrapping or covering of weapons in Shang tombs, it is likely they were part of the funeral practice. By physically containing the weapons away from view, it would create disparate relationships between those weapons, tomb furniture, the deceased, the immediate families of the deceased, viewers, and possibly spirits and ancestors as well. Using Qijiazhuangdong M269 as an example again, the five spearheads that were wrapped together were similar in form, size and decoration. It is likely they were considered as a set. They might have been separated from other weapons and objects to highlight their unique biographies. They probably performed particular functions during the use-life stage. They could also be reminders of relationships formed at a point during the lives of weapons with the deceased. For those five spearheads, they were all lightweight and thin.⁵⁶⁵ It is possible they were kept as a set for martial dances as discussed in Chapter 8.3.

7.5 Discussions: the making of weaponry assemblages

The above discussions have outlined weapons of various types and materials in tomb depositions. Through quantitative and qualitative analyses, some patterns were identified. In combination with other evidence, I have discussed their individual cases in archaeological contexts, which has revealed the functions, roles and relationships that weapons may have. Based on studies in this chapter and the approaches (Chapter 3) adopted in this thesis, I will

⁵⁶⁵ *Ibid*, 344.

use weapons from Huayuanzhuang M54 as an example to illustrate the making of a weaponry assemblage. The report has divided a total of 277 weapons into the following categories:⁵⁶⁶

- a. Bronze weapons: 88 bunches of arrowheads (881), seven broad flat axes (one with the inscription ‘*yachang*’), 78 spearheads (36 with the inscription ‘*yachang*’), 73 dagger-axes, three hooked-head knives (all with the inscription ‘*yachang*’).
- b. Jade weapons: nine broad flat axes, two jade spearheads, eight jade dagger-axes, one curved-spine knife, three arrowheads.
- c. Jade weapons with bronze handles: two jade spearheads with bronze handles, three jade dagger-axes with bronze handles.
- d. Stone weapons: one broad flat axe.
- e. Bone weapons: four bunches of arrowheads (43).

Based on detailed analysis in this chapter and previously, they could also be understood in the following groups:

- a. Weapons commissioned for Yachang: 36 spearheads and three hooked-head knives (all with the inscription ‘*yachang*’;
- b. Weapons used by Yachang: though no metalwork wear analysis has been carried out on weapons in Huayuanzhuang M54, informal observations on some of the dagger-axes reveal they show wear and tear during author’s visit to the collection at Anyang

⁵⁶⁶ Zhongguo shehui kexueyuan kaogu yanjiusuo 2007.

Archaeological Station. This is supported by analyses of the weaponry collection from the British Museum and many show wear and tear. This could also include five bronze broad flat axes which are probably battle-axes.

- c. Weapons belonging to a sacrificial victim: the stone broad flat was placed underneath the victim's skeleton.
- d. Weapons for hunting: four bunches of bone arrowheads.
- e. Weapons for execution: one large broad flat axe with the inscription '*yachang*'.
- f. Weapons for martial dances: 20 lightweight and thin dagger-axes.
- g. Others.

This may not exhaust all possibilities, but this list demonstrates the diversity of weapons in an assemblage and their multiple functions. In combining their lethal nature and performance ability, they served as one of the key tools of social strategy and a foundation of social order to the Shang.

Chapter 8 Weapons in non-burials

As discussed at length above, weapons have been found primarily in tombs. Although they have also been recovered from non-burial contexts, these have rarely been addressed by scholars.⁵⁶⁷ The finds are comparatively small in number, but they provide evidence on the deposition of weapons from a non-mortuary perspective. A literature review shows that such weaponry deposits include *jisikeng* 祭祀坑 (sacrificial pits) and *jiaocang* 窖藏 (hoards), known at a number of Shang sites. The review also indicates that the terminology for these deposits remains inconsistent, for example, what the interpretative distinction is between a pit for sacrificial offerings and one for the discarding of waste. There is also an imbalance of data available. Among the finds, jade and bronze objects are often reported in detail, but less attention is paid to other objects (e.g. ceramics) or the wider context of deposition. In this chapter, I will first discuss the issue of terminology regarding these non-burial deposits and how a reassessment of the evidence can achieve clearer understanding. The second section will be a case study of weaponry depositions in sacrificial pits at Xibeigang, Anyang.

8.1. The interpretation of non-funeral deposits

The term *Jisikeng* 祭祀坑 (sacrificial pits) has often been used in Chinese archaeology to describe pits containing multiple layers of intentional deposits of objects with traces of ash, suggesting burning. Yet, the exact nature and intentions underlying such deposits remain unaddressed in scholars' work. One example is pit PWZH6 from the Wangjiazui 王家嘴

⁵⁶⁷ Here non-burial is used as opposed to tombs that are constructed for the deceased to be buried inside. As works on weapons have been primarily focused on typology, weapons have generally been studied detached from their archaeological contexts. E.g. Jing Zhongwei 2011; Shi Yan 2008.

locus at Panlongcheng, interpreted by the excavators as a sacrificial pit beneath a building (PWZF7).⁵⁶⁸ The contents included ceramic vessels and bronzes, and all items were uncovered within the middle layer, comprising black ash soil. While a profile drawing of the pit was provided, the stratigraphical relationship to building PWZF7 was not given, nor did the pit appear in the general layout plan of the building in the report. All bronzes were itemised in the profile drawing and described (in the finds section), but the ceramics were neither shown in the layout of the pit, nor mentioned in the finds section.⁵⁶⁹ It is uncertain then whether the ceramics in PWZH6 were buried as whole pieces or sherds. Furthermore, different names were assigned to pits sharing similar characteristics (shape, depth and black burned ash as filling) in the same report, such as the 19 pits excavated at the Lijiazui 李家嘴 locus, which were labelled ‘rubbish pits’.⁵⁷⁰ The criteria for naming pits appears to rely on the finds assemblage, as PWZH6 yielded bronze tools and weapons, while the other pits contained only ceramics. No other explanation is provided to support PWZH6’s ‘sacrificial’ nature. However, in the chapter summary, the excavators claimed that the 19 ‘rubbish pits’ could also be ‘hoards’. In the same paragraph, the excavators further admitted that most of the remains at the Lijiazui locus were deconstructed in the past and it was rather difficult to determine the exact nature of the pits.⁵⁷¹ Such contradictory statements are not helpful in shedding light on the attributes of those pits and enabling future study of them. The designation (hoards, or rubbish / sacrificial pits) of those pits may have a direct impact on scholars’ research. Because the 19 pits from the Lijiazui locus were considered to be rubbish

⁵⁶⁸ Hubeisheng wenwu kaogu yanjiusuo 2001, 125-126.

⁵⁶⁹ *Ibid*, 128-135.

⁵⁷⁰ *Ibid*, 147-213.

⁵⁷¹ *Ibid*, 214.

pits, many other characteristics, such as the spatial relationship between them and their wider landscape context, would have been overlooked. For example, three of the pits (PLZH10, PLZH16 and PLZH17), containing various types of ceramic vessels, animal bones and ashes, were close to each other in a triangular layout and situated by the Panlong 盤龍 lake.⁵⁷² It is possible that those pits were intended as offerings related to the spirits of the lake, acting as negotiators between the people at Panlongcheng and natural forces. Unfortunately, the datasets are not large enough to deduce patterns on the choices of weapons and other objects in those pits in contrast to those found in burials. In addition, there may be other pits containing object depositions as offering, but their labelling, as either ‘rubbish pits’, ‘sacrificial pits’ or ‘hoards’ in the report, has restricted further investigation.

8.2 A case study: weapons in Xibeigang sacrificial pits

In the Xibeigang royal cemetery, surrounding 11 large tombs were over 2,000 sacrificial pits.⁵⁷³ Among them, about 80 pits were known as ‘*daofuzang*’ ‘刀斧葬’ (‘knife and axe burials’). They were rectangular vertical pits containing multiple headless human skeletons together with a number of bronze knives and axes, and grinding stones (see Figure 8.1).⁵⁷⁴ They have generated scholarly discussions regarding the identity of the victims and the functions of the knives and axes. It has been proposed that the victims might be war captives

⁵⁷² *Ibid.*, 212-213. Remains in relation to the landscape have been under-explored in Chinese archaeology. One issue is that geophysical coordination information is rarely recorded. The tomb-oriented approach in archaeological excavation practice, derived from the historiographic tradition (Chapter 5.1.2), also has an impact. I will not, however, discuss this further, as it is out of the scope of this thesis.

⁵⁷³ Zhongguo shehui kexueyuan kaogu yanjiusuo 1994. Those pits can be divided into three types based on their contents: pits for sacrificial human victims; pits for sacrificial animals; pits for objects offering.

⁵⁷⁴ These pits were uncovered during excavations between 1934-1935 among over 1,000 sacrificial pits, see Gao Quxun 1967.

employed by the Shang as craft slaves, with the knives and axes being the tools they used.⁵⁷⁵ Others have suggested that they came from non-Shang groups and were fighting forces or chariot managers hired by the Shang, the knives and axes being copies of steppe-type weapons made at Anyang.⁵⁷⁶ These interpretations are certainly plausible, but I propose that the knives and axes were sacrificed with human victims, who were war captives from the northern areas, for the glorification of Shang victory as well as a display of Shang hegemony to the living, ancestors and spirits. I will demonstrate this through a contextual analysis of the pits, together with a biographical study of the knives and axes in combination with evidence from the latest research into the skeletons from sacrificial pits.

First of all, the style of weapons deposited provides a clue. The shapes and forms of those knives (curved spines with rings at the terminal of the handle) and axes (socketed) in the sacrificial pits indicate they are of non-Shang origin and belong to the so-called '*beifangshi qingtong*' 北方式青銅器 (northern style bronzes).⁵⁷⁷ They were native to neighbouring groups to the north of Anyang. The repetitive occurrence of grinding stones, axes and knives indicate that they may have been in sets. The combination resembles weapon/tool sets found in chariot boxes at Anyang, proposed by Wu Hsiao-yun as routine items for chariot drivers, representing driving and fighting skills.⁵⁷⁸ For example, horse and chariot pit M40 at Anyang was buried with a whip handle, a bow-shaped object, a grinding stone, a knife, a dagger-axe,

⁵⁷⁵ Zhu Fengxian 2013.

⁵⁷⁶ Rawson 2015.

⁵⁷⁷ On definitions, characteristics and distribution of northern style bronzes, see Lin Yun 1986.

⁵⁷⁸ Wu Hsiao-yun 2013.

a group of arrowheads and an awl.⁵⁷⁹ We could speculate that the combination of knives, axes and grinding stones in the sacrificial pits could also be tool/weapon sets and might be personal kits for those victims. This is supported by Gao Quxun's 高去尋 observations on the quantities of skeletons and objects in the pits.⁵⁸⁰ Due to preservation conditions, the exact numbers of victims can be identified only in 26 out of 80 burials. Among them, eight pits had matching numbers of skeletons and sets of knives, axes and grinding stones (n=10). Another three pits (M1104, M1105 and M1106) had equal numbers of skeletons, knives and axes but without any grinding stones.

Although these pits are uniformly named 'knife and axe burials', they were unlikely to represent a single group deposited in a single act. Only 80 pits of this type have been found among over 1,000 sacrificial pits.⁵⁸¹ The burials are rectangular vertical pits that are similar to other sacrificial pits that only contained multiple numbers of beheaded human sacrifices. No distribution patterns have been identified regarding their relative locations to other pits. This suggests that those pits were not intentionally selected to include knives, axes and grinding stones, but represent a consequence of accumulations. If we consider the human victims to have been war captives, it is logical to deduce that those sacrificial events took place after one or a series of campaigns. As the chronological dating of the large tombs in the cemetery spans the whole late Shang period (about 200 years),⁵⁸² the pits may equally take a similarly long time period to form.

⁵⁷⁹ Shi Zhangru 1968.

⁵⁸⁰ Gao Quxun 1967, 357-359.

⁵⁸¹ *Ibid.*

⁵⁸² Zhongguo shehui kexueyuan kaogu yanjiusuo 1994.

Biographical studies of knives from the pits also shed light on the complexities of ‘knife and axe burials’. Many of them did not just vary in form, but also underwent different production and life stages. Among a total of 570 knives, 494 were made using bi-valve moulds, and the rest were produced in one-sided moulds.⁵⁸³ It has been suggested that this demonstrates the advancement of bronze casting technology at Anyang from one-sided to bi-valve moulds.⁵⁸⁴ However, bronze objects found at Anyang were rarely made in one-sided moulds.⁵⁸⁵ The only examples were those found in ‘knife and axe burials’. Their absence otherwise suggests that they were unlikely to have been produced by the Shang at Anyang. In addition, signs of wear and marks on knife surfaces imply they had different use-lives. Studying a small number of knives that are preserved in good condition, Gao Quxun noted that some have sharp edges and a few may have been used extensively with traces of repair and re-polishing on surfaces.⁵⁸⁶ On the other hand, some knives are small and lightweight, and appear to be fresh from their moulds without having undergone finishing processes of filing and grinding, and therefore seemingly intended as products for burials.⁵⁸⁷ Despite it being uncertain why such unfinished products would be interred with sacrificial victims in the pits,⁵⁸⁸ their presence, together with extensively used weapons, further advocates that the depositions of ‘knife and axe burials’ were not a single event, but possibly the result of multiple sacrificial activities

⁵⁸³ Gao Quxun 1967.

⁵⁸⁴ Li Chi 1949.

⁵⁸⁵ Zhongguo shehui kexueyuan kaogu yanjiusuo 1994.

⁵⁸⁶ Gao Quxun 1967.

⁵⁸⁷ J. Rawson, personal communication 18th January 2016.

⁵⁸⁸ It is tempting to interpret those unfinished products as they were made for burials. However, other evidence does not support such claim.

taking place over a period of time and connected with the multiple wars the Shang had with various groups from the neighbouring areas.

Finally, it is on the identity of those beheaded, such as whether they were slaves, criminals, and/or war captives. We should not forget, however, that although this deduction is based on our modern perceptions that beheading is a punishment and humiliation, the Shang mortuary data does support such an interpretation. Those headless victims were buried in groups without any furniture (coffins or chambers) and few or no goods. They were mostly found around large tombs in the royal cemetery or underneath building foundations. In contrast, the large majority of burials at Anyang were single occupant tombs with furniture as well as grave goods. They were clustered together and formed cemeteries.⁵⁸⁹ Moreover, recent research that combines records of human sacrifices in oracle bone inscriptions with strontium isotope analyses of skeletons from the sacrificial pits has shed new light on this puzzle.⁵⁹⁰ The preliminary results indicate that most victims came from modern Gansu and Shaanxi areas, northwest of Anyang, groups that frequently appeared in oracle bone inscriptions as being in wars with the Shang. The evidence therefore strongly suggests that those headless victims were war captives from the neighbouring areas. It is then unlikely that the Shang would produce northern style weapons and tools for those they executed.⁵⁹¹ Considering that the metals could have been easily recycled by the Shang, the burying of beheaded war captives with their personal weapon/tool sets must have been a deliberate choice. As seen

⁵⁸⁹ Tang Jigen 2004.

⁵⁹⁰ For a recent study of sacrificial records on oracle bone inscriptions, see Tang Jigen 2014. Regarding the strontium isotope analysis project, the preliminary result was recently reported in the news: http://news.xinhuanet.com/2016-07/25/c_1119277302.htm (accessed 20th August 2016).

⁵⁹¹ Cf. Zhu Fenghan 2013, 22.

from oracle bone inscriptions, wars and sacrifices both played a significant part in the construction of Shang authority and world order.⁵⁹² As those knives and axes are stylistically different from Shang pieces, they would be easily recognised and probably served as identity markers to those victims that were beheaded. If the beheading of captives indicates commemoration and trophy-taking,⁵⁹³ those weapons were then ‘sacrificed’ together with their owners, in acts that highlighted Shang military victory and strength.

8.3 Summary

The Chapter challenged the issue in interpreting non-funerary depositions and also highlighted the importance of including the materials from those contexts. The case study of ‘knife and axe burials’ provided further evidence on the diverse use of weapons.

⁵⁹² Campbell 2013.

⁵⁹³ *Ibid*, 99.

Chapter 9 Conclusion

‘Ritual and warfare are the most important state affairs.’

‘國之大事在祀與戎’

Zuozhuan 左傳⁵⁹⁴

This final chapter will first synthesise what I have found during this thesis, with evaluations of the strengths and weaknesses of my conclusions. I will then assess the theoretical framework and methodology I have employed and conclude with recommendations for future work.

9.1 Multifaceted weapons

This thesis began from a widely accepted dichotomy in material studies of Shang archaeology, and indeed other periods, that objects are divided into categories of ritual and others (e.g. weapons and tools). That the majority of weapons have been found deposited in tombs has conveniently led to debates centred on their symbolic meaning and/or social roles. Meanwhile, little has been discussed regarding their function as killing implements. In order to shift away from these paradigms, this research adopted a biographical approach with the aid of statistics, employing metric data and metalwork use analysis for the first time in a study of Shang weaponry.

⁵⁹⁴*Zuozhuan* 左傳 ‘Commentary of Zuo’, is a brief chronological history of the Lu 魯 state, in present day Shandong province in the Spring and Autumn period (770–481 B.C.), when it was probably compiled. The authorship is traditionally attributed to Zuo Qiuming 左丘明, an official historian of the Lu state. Falkenhausen plausibly criticised the excessive quotation of this saying in many scholars’ work and argued it was only ‘an emic expression of the perceived social and intellectual reality at the time’ rather than a theory that generalised the Spring and Autumn period, see Falkenhausen 2006, 22.

Having acknowledged the issues with previous research, I outlined a framework of theoretical perspectives and strategies to study weapons in a dynamic and holistic way (Chapter 3). In this thesis, I have brought archaeological evidence, contemporaneous texts (oracle bone and bronze inscriptions) and visual observation of bronze weapons from the British Museum collection together (Chapter 5) to provide narratives of weapons through their birth-life-death stages. The investigation started with the production stage, from the raw materials required, through processing, to finishing (Chapter 7), using a combination of archaeological evidence and technological study. Although weapons have been mainly recovered from burials, interactions between weapons and people started from the acquisition of raw materials and continued through the production stage, use, deposition/discard/recycling and occasionally recovery/reuse. The analysis of weaponry production revealed the ways in which characteristics of materiality and associated value were built into particular types of weapons. By combining this with observations from metalwork wear analysis on 12 bronze weapons from the British Museum collection (Chapter 6), new light is shed on finishing processes during production. Two variants of striations on weaponry surfaces (blades and bodies) were noted. A comparison with tool marks on bronze weapons from the Terracotta Army of the First Emperor suggests that those marks, observed on some of the Shang weaponry blades, could only have been produced using rotary wheels, as the lines are equally spaced and parallel. Metalwork wear analysis on those weapons has also revealed evidence regarding their practical use. A range of wear and tear marks have been noted. Some weapons showed extensive use; some had blunt edges and seemed to be in pristine condition; others had textile impressions on their surfaces. One disadvantage of using this collection at the museum is that the objects are unprovenanced. They were stylistically dated to the Shang, but the contexts of their discoveries remain unknown. They may also have received conservation, alterations or restoration treatments before they were acquired by

the museum. A further weakness is that there has been a lack of experimental archaeology carried out on Shang weapons to provide comparanda for the wear and tear observations. This pilot study has nevertheless provided first-hand information on the production processes, use of bronze weapons as killing implements and depositional treatment.

The diversity of weapons' materials and types in tomb assemblages has always been a puzzle. Instead of gathering all published data from complete and looted tombs, I believe it has been more useful to study weapons from complete tombs that also contain other variables. Benefitting from previous research into the mortuary practices of the Shang, I compiled a database of elite tombs and a database of lineage members (Guojiazhuang) to enable analysis of each social class as well as comparative studies (Chapter 5.1.4). In Chapter 8, I began by exploring the characteristics of these two databases. Bronze weapons were widely distributed among both elite and lineage members, while jade weapons were exclusive to elite tombs. The almost complete absence of bone, stone and shell weapons presented an issue. Changes in the numbers of weapons and the ratios of tombs with weapons from early to late phases indicate a shift in practice. Fewer tombs contained weapons, but they had larger quantities than earlier phases. On the identity of those individuals buried with weapons, I challenged previous interpretations of professional soldiers/generals and of the military organisation of the Shang featuring a standing army. In combining archaeological evidence and oracle bone inscriptions, I argued that lineage members were called upon when campaigns were initiated, and they otherwise participated in a wide range of activities, such as farming and irrigation works. Among the elites, martial prowess was highlighted and celebrated through the inclusion of large assemblages of weapons of various types and materials of weapons in tombs. I have also argued that martial and military specialisations were developed among some people, both elites and lineage members, in the later phases of the late Shang. However,

the study of the identity of those buried with weapons was restricted by the lack of osteological analysis of skeletons. We will be able to conduct further research if information regarding the deceased's age, gender and causes of death becomes available.

Several case studies of individual weaponry types and materials indicated the diversity of weaponry functions. Using a combination of metric data and textual and archaeological evidence, I was able to break away from the historically connoted term *yue* and drew clustering patterns from statistical applications for regrouping the materials. I identified two varieties of broad flat axes. The first group (length over 30cm and weight over 3.6kg) were execution-axes and also served to represent the power to punish. I named the second group 'battle-axes', as they were probably personal weapons that the elites fought with. Furthermore, the adaptation of spearheads was explored from an ontological perspective. There was also diverse use of dagger-axes. A statistical analysis of metric data of dagger-axes of various types indicates that lightweight and thin examples in tombs were primarily type III. Some of them also had high content of lead according to metallurgical studies. They were likely employed in martial dances as a proxy for battle formation practice. Their archaic form and possibly their colour was a deliberate choice to remind audiences of past campaigns or most likely great military glory. The diversity among an individual type suggests the complexity of weapons and their assemblages in tombs. The meaning, use and significance of weapons are indeed multifaceted. However, almost all metric data for statistical analyses were collected from reports of elite tombs with large assemblages. Although the results were fruitful, the lack of data from small tombs and non-burial contexts has restricted research. For example, whether there were any size and weight differences between weapons from various contexts.

The deposition of weapons in settlements, building foundations and sacrificial pits provided a different perspective on their use (Chapter 9). I first reviewed the paradigms existing in interpreting those non-funerary finds. A case of weapon (knives and socketed axes) depositions in sacrificial pits at Xibeigang using the biographical approach enabled me to identify characteristics of depositions and the intentions underlying them. Those weapons were sacrificed together with their owners in order to commemorate the military victory and hegemony of the Shang over other groups.

The multifaceted functions of weaponry made them mediators between the Shang people and the spiritual, political and social worlds, including sacrifices, combat, hunting, martial dance, punishment, ceremonies, tribute, and displays of authority, wealth and identity. When combined with the numerous campaigns and conflicts referenced in oracle bone inscriptions, bronze weapons can be viewed as implements of power in battles, and different types were used by both elites and lineage members. The value of an individual weapon type (broad flat axes) and its material (jade) was also increased due to its connection with earlier periods, namely the Erlitou and Neolithic. New associations and meanings were developed during the Shang. Furthermore, huge amount of resources, technology and the organisation of labour were invested in the production and consumption of weapons. The presence, quality and quantity of weapons in elite and lineage tombs indicate the significance of weapons to the Shang people and society. All of these characteristics suggest that weapons, as implements of war and punishment, ‘penetrated’ Shang society, and were institutionalised and socially

structured. Following Chang Kwang-chih's suggestion that bronzes were tools of power,⁵⁹⁵ I argue that weapons were strategic tools in pursuing and maintaining power for the Shang.

More importantly, this thesis did not just shed light on the use of weapons and martial aspects of Shang society, but explored interactions between materials and human beings. Weapons did not merely passively reflect the desires and expectations of the living and the community; the materiality of the weapons mattered. Their materials, colours, forms, decorations, inscriptions, blade effectiveness and associations all played an active part in the entwinement between weapons and people. Aspects of finished products, such as choices of material, size, form and decoration (e.g. colour, decorative patterns, lustre and inscriptions), were the result of constant negotiations between humans and materials. The materials would determine the techniques and processes applied, while humans would also place their agency in the process, reflecting individual creativity, social tradition, economic factors, and functional requirements.

9.2 Placing weapons in context: warfare seen from oracle bone inscriptions

In oracle bone inscriptions, records of warfare related activities are frequent (see Chapter 4.2) and provide evidence that is not available through material remains, as no battlefields of the Shang have been identified yet. In many records of military campaigns, numbers of men were frequently mentioned, ranging from a few hundred to many thousands. One example is:

丁酉卜，殼貞：今者王共人五千正土方，受 XX。三月。(Jiaguwenheji 6409)

⁵⁹⁵ Chang Kwang-chih 1986.

‘On the *dingyou* 丁酉 (fourth) day, Ke tested: the king (should) levy 5,000 men for an expedition against the Tu 土 polity and the king’s action will be aided. Third month’,⁵⁹⁶

The scale of such substantial operations correlated with large numbers of weapons in burial assemblages as well as wide distributions of weapons in tombs of both elite and lineage members (Chapter 7.1). This is supported from the inscriptions that campaigns were led by kings, officers and specific individuals. On the nature of such military forces, it is important to note the action words used. In the example above and many others, ‘共’ (*gong* levy), ‘征’ (*zheng* called upon) and 舉 (*ju* raise) seemed to be the most frequent. All these action words shared a commonality that forces were gathered when there were campaigns. Keightley further observed that the duty of raising forces was confined to kings and members of the royal family, while others were called upon to serve.⁵⁹⁷ Several offices, such as *she* 射 (archers) and *wangchen* 王臣 (his majesty’s servitors) repeatedly appeared, and some of them were also recorded in various other roles as well, such as ploughing, performing sacrifices and building projects. This provided further evidence that the Shang was unlikely to have a standing regular army but people were engaged in various roles and were called upon for wars (Chapter 7.2.2.1).

Wars seemed to be featured frequently between the Shang and the neighbouring groups. A survey shows that 136 polities/groups were engaged in wars against the Shang in oracle bone

⁵⁹⁶ Campbell 2007, 115.

⁵⁹⁷ Keightley 2012, 91.

inscriptions.⁵⁹⁸ Some of the polities first appeared to be allies of the Shang, but later became the opponents the Shang fought against. One example is the Zhou 周, who were based to the west of the Xi'an area during the late Shang. In early period inscriptions, the Zhou first appeared as an enemy group, then as an ally. They were not mentioned for a long time in the records, until they switched sides again,⁵⁹⁹ and subsequently conquered the Shang around the middle of the 11th century B.C. Such dynamic and shifting relationships are also a testimony of the Shang's military power. Furthermore, the blessing received in many war inscriptions indicated the legitimacy of Shang wars.⁶⁰⁰ Since the blessing came from ancestors or spirits, the sacrifices of captives served to glorify the ancestors and diminish enemies.⁶⁰¹ This displays the two facets of Shang warfare. It was not just a means to obtain resources, drive out enemies or establish hegemony, but was also instrumental to the establishment of Shang world order. It is no surprise then that weapons, as implements of war, were deposited in tombs in large quantities and various materials. They became monumentalized as implements of warfare and played a significant role in maintaining the world order in Shang society.

9.3 Directions for future research

The application of theoretical frameworks to the study of weapons should become universal. The benefits are not only reflected in viewing weapons from varied perspectives to disentangle preconceptions, but also in the organisation of evidence. To explore underlying

⁵⁹⁸ Wang Yuxin and Yang Shennan 1999, 498-499.

⁵⁹⁹ Campbell 2007, 130-132.

⁶⁰⁰ Keightley 1999, 2000.

⁶⁰¹ This is based on some rare inscriptions found on human skull fragments. The captured enemy leaders were sacrificed to named ancestors, see Campbell 2013, 99. For a more detailed discussion of Shang world order, see Campbell 2007.

characteristics of various forms of weapons, I advocate the publication of more metric data, notably from small tombs and non-funerary contexts. As the first attempt at applying metalwork wear analysis to Shang weapons, this study has yielded information never observed before and not available in other resources either, yet the results are preliminary regarding the production and use of weapons. It would be fruitful to employ empirical data from excavated materials in combination with metallurgical and metallographic studies and experimental archaeology. More attention should be paid to weapons from non-burial contexts. Their contexts (e.g. geo-coordinates in the landscape) as well as associated finds will shed further light on the practice of weapon deposition and its significance. Multiple-disciplinary studies, e.g. anthropological examination and isotope analysis, of skeletons are also needed to provide information on the gender, age, and ethnic and geographical origins of individuals, which will facilitate further discussions of the deceased's identity in relation to weapons. Another area of research interest is decorative patterns on weapons in combination with forms, types and other attributes. Further attention could also be paid to the mechanisms behind typological development and the adoption of new types. It is unlikely that they merely reflect technological development and effectiveness at killing, but could tell us more about the wider contexts of the cultural and social needs of the people.

Appendix 1: Catalogue and wear observations of Shang bronze weapons in the British Museum



British Museum Number: 1880,0802.85

Object name: dagger-axe

Materials: copper alloy

Date and period: late Shang, c.1200-1050 B.C.

Length: 15.8 cm

Weight: 250g

Description: The blade is triangular with a rounded tip and a rectangular tang. Both sides of the blade have a slightly raised median ridge with cast symmetrical decoration. The ridge has a diamond shaped motif at its apex. Either side of the diamond are symmetrical complex geometrical designs, consisting of connected lines, circles and swirls. There are three apertures- two square ones at either side of the blade's base and one circular one in the

middle of the tang. They were probably for cords to assist with binding a wooden shaft on the tang.

Provenance: donated by Sir Augustus Wollaston Franks in 1880.

Use-wear observation:

The dagger-axe's tang is partially damaged as well as missing one corner of the base of the blade. The patination of the break suggests that it is historic. It is covered with a black patina with unusual elements in white and red. The red might be cuprite, a known oxide mineral corrosion product on bronze objects.¹ The white areas may represent corrosion products on areas with high tin content. Multiple notches and nicks are observed on the blade, though the cutting edge appears dull.

¹ M. Johns, personal communication 5th July 2015.



British Museum Number: 1915,0409.100

Object name: dagger-axe

Materials: copper alloy

Date and period: late Shang, c.1200-1050 B.C.

Length: 21 cm

Weight: 783g

Description: a hafted dagger-axe with slender blade and round tip. The lower blade is slightly indented. The oval shaped socket is not located in the centre of the overall object. The protrusion behind the socket is rounded with a projection at its base. The protrusion is decorated with incised lines.

Provenance: Purchased from S M Franck & Son in 1915.

Use-wear observation:

The whole object is largely covered with green patina and small areas of red. The blade has a number of notches as well as nicks. On side A (with museum number), there is a visible

scratch near the lower part of the blade, c.1cm from the tip. As it cuts through corrosion products, it is likely to represent post-depositional damage. On side B, there is slightly less patination. Some striations can be observed. On the lower blade, two areas of dense striations were noticed on the cutting edge and body, about 1/2 and 1/3 distance from the tip. There is minor damage on the tip.



British Museum Number: 1932,1014.19

Object name: dagger-axe

Materials: copper alloy

Date and period: late Shang, c.1200-1050 B.C.

Length: 25.8 cm

Weight: 360g

Description: a hafted dagger-axe with pointed tip. The triangular blade is asymmetrical, the lower part more curved than the upper. A raised median ridge runs from the socket to the tip of the blade. The protrusion behind the socket is squared and decorated with five raised ribs.

Provenance: purchased from Karlbeck Syndicate in 1932.

Use-wear observation:

There have been two major repairs to this dagger-axe. One is 1/3 distance from the tip; the other is on the shaft hole. Conservation records in the British Museum suggests lead solder and green paint was applied to the object before it became part of the museum collection.² The conservation project in 2002 removed the paint and treated the bronze disease with black silver oxide in a slurry of industrial methylated spirits.

The dagger-axe is almost completely covered with green patina. There are textile imprints on both sides of the blade body, which suggest the object was either covered or wrapped with fabric when deposited. Though parts of the blade are corroded, a bevel is visible on the edge. On side B, striations are observed next to the breakage in the blade body. Multiple nicks and notches were apparent on the cutting edge.

² British Museum Merlin Collection Database (internal).



British Museum Number: 1932,1014.20

Object name: dagger-axe

Materials: copper alloy

Date and period: late Shang, c.1200-1050 B.C.

Length: 25.8 cm

Weight: 400g

Description: A dagger-axe with tang and a round tip. The blade is triangular. The lower blade is more curved than the upper part. There is a median ridge from the tip to the base, either side of which run two inlaid strips containing a serial of swirls. There are three apertures near the blade's base. Two squares ones at the either side of the base and a circular one in the

middle. The tang is long and rectangular in shape. On the end of the tang, on both sides, is an inlaid image of a mythical creature in a square box, considered to be a lineage insignia.³

Provenance: purchased from Karlbeck Syndicate in 1932.

Use-wear observation:

Traces of the haft remain. Possible turquoise inlay in the motif at the end of the tang.

³ He Jingcheng 2009.



British Museum Number: 1933,0413.11

Object name: dagger-axe

Materials: copper alloy

Date and period: late Shang, c.1200-1050 B.C.

Length: 24.8 cm

Weight: 400g

Description: a dagger-axe with tang and a pointed tip. The blade is slender and the lower part is more curved than the upper. There is a banister separating the blade and tang. The tang is not located in the centre of the banister. A circular aperture is in the front half of the tang. The end part of the tang is decorated on both sides. On side A, inlays depict a figure of a man holding two large knives with curved spines. The other side shows a disc with swirling patterns flanked by two similar knives to those depicted on side A.

Provenance: purchased from Karlbeck Syndicate in 1933. In the museum record, it was found/acquired in Zhangde Fu, northern Henan province, an old administrative area that includes modern Anyang and the adjacent area.

Use-wear observations:

Both corners of the tang are missing. On side A, there is a 0.8cm long crack on the surface from the cutting edge to the blade body which is not visible on side B. The majority of the object is covered with red and green patina. In areas with little corrosion product, dense striations are observed. On the blade body, they appear to be horizontally oriented. Striations on the bevel are at a diagonal angle. The cutting edge is sharp with multiple notches and nicks. Trace of shaft remains is visible on the front half of the tang. The decoration at the end of the tang was likely to have been inlaid with turquoise.



British Museum Number: 1936,1118.36

Object name: dagger-axe

Materials: copper alloy and turquoise

Date and period: late Shang, c.1200-1050 BC

Length: 21.5 cm

Weight: 430g

Description: a dagger-axe with pointed tip and tang. The blade is broad and triangular with a median ridge. The upper blade is slightly longer than the lower part and with the tip pointed slightly downwards. The tang is not located in the centre of the overall object but at the top

half. There are four apertures. A large circular one is across the ridge and close to the base. A rectangular one and a small circular one are at the corners of the base of the blade. There is a small circular one in the front half of the tang, almost in line with the large aperture. The tang is quite short and the back half is decorated with inlaid turquoise in the design of an animal facial motif.

Provenance: purchased from: George Eumorfopoulos in 1936.

Use-wear observations:

The object is almost completely covered with green patina with one small patch of blue corrosion product. Large areas of the blade body have mineralized textile preserved in the corrosion product. Though the blade is blunt, multiple notches are observed. On side A, there is a crack, about 5.5cm from the tip and to the right side of the applied writing 'B.M.', but which is not visible on the other side. On side B, there is a small area with little corrosion product (in the middle of the lower blade body). A number of scratches have penetrated the surface of the patina and possibly represent post-depositional change.



British Museum Number: 1945,1017.189

Object name: Curved-spine knife

Description: large knife with curved spine and upward-turned dull tip. It has alternating 90 degree protrusions on the back of the blade, and a short handle. A band of cast goat heads with geometric patterns runs along the upper part of the blade body.

Date and period: late Shang, c.1200-1050 BC

Length: 48.3 cm

Weight: 650g

Provenance: collected by Edgar Gutmann; bequeathed by Oscar Charles Raphael in 1945.

Use-wear observations:

The object is completely covered with green and blue patination. Some parts show historic bronze disease. On side A, there are two cracks near the blade. Intense striation marks are observed on blade and handle surfaces (including areas with decoration). The cutting edge is

sharp with two notches and many small nicks. The upward tip is dull and slightly damaged with the middle part having a notch. A break occurred a third of the way down the blade from the tang, the cause of which is unknown. It has been repaired by the Conservation Department at the British Museum.⁴

⁴ Little is known regarding the breakage. According to the British Museum's conservation record, the crack was previously treated, and then re-repaired with adhesive and backed with fiberglass tissue in 1991. The previous repair with soft solder took place at an unknown date. Because the crack had been soldered, it is impossible to tell the circumstance that caused the breakage (M. Hockey, personal communication 2nd March 2015).



British Museum Number: 1947,0712.413

Object name: broad flat axe

Materials: copper alloy

Date and period: late Shang, c.1200-1050 BC

Length: 36.4 cm

Weight: 4700g

Description: a large flat axe with a monstrous face (serrated teeth, two fangs and large ears) on both sides of the blade body. The rectangular tang decorated with a coiled dragon is not located in the centre of the overall object but at the lower half, which probably would provide more stability to bind the organic shaft.

Provenance: bequeathed by Henry J Oppenheim in 1947.

Use-wear observations:

The object is mostly covered with green patina. Some parts show historic bronze disease. Traces of shaft remains are visible on the front half of the tang. Due to the surface oxidation on the blade, no striations of tool marks visible and the cutting edge looks rather blunt, except far right corner of side A has less patination which reveals a sharp edge. A series of small nicks were observed on the blade.



British Museum Number: 1948,0716.40

Object name: dagger-axe

Date and period: late Shang, c.1200-1050 BC

Length: 30.4 cm

Weight: 310g

Description: a dagger-axe with curved tang. The blade is slender with a moderately rounded tip. The lower blade is slightly longer than the upper part. There is a banister between the blade and tang. The tang is not centred to the overall object. On the front half of the tang, there are thinly incised character-like lines on side A and one circular aperture. The latter half of the tang is decorated with inlaid bird motif.

Provenance: collected by Cranmore Ethnographical Museum; bequeathed by Harry Geoffrey Beasley.

Use-wear observations:

The object is covered entirely with green patina with red discolouration. The cutting edge is blunt with one small notch on the upper part, 2.5 cm from the tip. There are inscription-like incised lines on the tang.



British Museum Number: 1953,1215.2

Object name: spearhead

Materials: copper alloy

Date and period: late Shang, c.1200-1050 B.C.

Length: 26 cm

Weight: 380g

Description: a spearhead with pointed tip and socket. The blade is in the shape of a leaf with a slight raised median ridge. There is a triangular shaped incised motif in the latter part of the ridge. Two circular apertures are at the end of the base of the blade to assist with attaching the shaft. The socket is decorated with cast taotie and cicada motifs. The haft is circular in section.

Provenance: collected by Dr E Cassirer; donated by P T Brooke Sewell, Esq.

Use-wear observations:

The spearhead is partially covered with green patina with red discolouration. In several places, the corrosion products have flaked off. On the blade body there are horizontal striations. On the cutting edge, which is quite sharp and with few corrosion products, are diagonally oriented striations. There are multiple notches and nicks on the blade. One notch on the lower blade (about 1.3 cm from the tip) appears to cut through the green patination and probably happened in modern times.



British Museum Number: 1953,1215.1

Object name: 'Kuaifu' dagger-axe

Description: a dagger-axe with inscriptions. The blade is slender with a median ridge. The upper part is more curved than the lower. The tip is pointed slightly downward. The latter part of the tang is elaborately decorated with a hollowed bird decoration. On side B, there is an inscription 'Kuaifu' 夸父 (father Kua) cast in the centre of the bird motif. On the other, there are squares shaped motif.

Date and period: late Shang, c.1200-1050 BC

Length: 36.4 cm

Weight: 350g

Provenance: collected by Dr E Cassirer; donated by: P T Brooke Sewell, Esq in 1953.

Use-wear observation:

The object is partially covered with green patina. The tip is slightly damaged. There are remains of the shaft on the front part of the tang. The bird motif, including the inscriptions, on the tang, are probably inlaid with turquoise. Bevels on the blade show the edges are shape. Multiple nicks and notches are observed on the cutting edge.



British Museum Number: 1981,1117.1

Object name: hooked-head knife

Date and period: late Shang, c.1200-1050 BC

Length: 47.2 cm

Weight: 550g

Description: a large knife with hooked head. The tang is narrow and extends slightly further than the base. There is a raised banister between the blade body and the tang. Only one aperture is on the tang, about one third distance from the handle.

Provenance: purchased from Brooke Sewell Permanent Fund in 1981.

Use-wear observation:

The object is largely covered with green patina with blue discolouration. The cutting edge is quite sharp and several areas on the blade show diagonal striations. There are multiple nicks on the blade, but no apparent notches.

Appendix 2: An Inventory of M5, M54, M160 and M1004

2.1 Xiaotun M5, Anyang.

Date: 2nd period of late Shang.

Tomb occupant: Fuhao, one of the three royal consorts of king Wuding.

Size and structure: 3.92m*5.6m-7.5m, rectangular vertical pit, 2 niches, ledged platform, 1 wait pit, 1 wooden chamber, 1 wooden coffin, 6 dogs, 16 human victims.

Contents:

Total: 1887 (not including 109 bronze buttons and 6883 cowrie shells)

- a. Bronzes: 425. Comprised of 210 vessels; 111 weapons; 7 weapon ornaments (1 terminal, 6 bow-shaped objects); 5 musical instruments; 31 tools (including small knives); 2 chariot and horse ornaments, 59 miscellaneous items
- b. Ceramics: 11
- c. Jade: 757 (53 weapons)
- d. Stones: 63
- e. Gems: 47
- f. Bones: 564 (including 29 arrowheads)
- g. Ivory: 5
- h. Shells: 15

Location of objects: Some weapons were found in the 4th layer of filling; jade and cowrie shells were mostly placed inside the coffin.

Weapons:

Total 168

- a. 111 bronze weapons: 6 bunches of arrowheads (57 in total), 4 broad flat axes, 91 dagger-axes, 10 curved-spine knives (4 large and 6 medium sized).
- b. 53 jade weapons: 39 dagger-axes, 3 spearheads, 2 broad flat axes, 1 hooked-head knife, 6 small curved-spine knives (imitating bronze examples). 2 jade dagger-axes with bronze handles
- c. 3 bone weapons: 3 bunches of arrowheads (29 in total)
- d. 1 stone weapon: 1 dagger-axe

Reference: Zhonguo shehui kexueyuan kaogu yanjiusuo 1980.

2.2 Huayuanzhuang M54, Anyang

Date: late 2nd period of late Shang.

Tomb occupant: male, approximately 35 years old, blade injuries on bones; excavators suggested that his name was ‘*yachang*’, a military leader and lineage head.

Size and structure: 6.03m*4.27m-6.2m, rectangular vertical pit, 1 wooden chamber, 1 wooden coffin, ledged platform, 1 waist pit, 15 human victims, 15 dogs.

Content:

Total: 612 items (not including bronze *pao*- buttons and gold leaves)

- a. Bronzes: 336. Comprised of 40 vessels; 249 weapons; 8 weapon ornaments (2 terminals, 6 bow-shaped objects, 2 *ce*- whip handles, not including 149 buttons); 16 tools (including knives); 23 bells
- b. Ceramics: 21
- c. Jade: 222, including 18 weapons
- d. Jade+ bronze composite: 5
- e. Stone: 6, including 2 weapons
- f. Bone: 22, including 4 bunches of arrowheads (43)
- g. Miscellaneous: gold leaves, bamboo items, ivory, wood and cowrie shells

Location of objects: weapons were placed inside the chamber and outside the coffin. Some weapons have remains of wooden shafts (a few wooden shafts have traces of lacquer); some weapons have remains of textile wrappings. Inside the coffin they were mostly jade.

Weapons:

Total 277

- a. 249 bronze weapons: 88 bunches of arrowheads (881), 7 broad flat axes, 78 spearheads (36 with the inscription ‘*yachang*’), 73 dagger-axes, 3 hooked-head knives (all with the inscription ‘*yachang*’)
- b. 18 jade weapons: 9 broad flat axes, 2 jade spearheads, 8 jade dagger-axes, 1 curved-spine knife, 3 arrowheads
- c. 5 jade weapons with bronze handles: 2 jade spear heads with bronze handles, 3 jade dagger-axes with bronze handles
- d. 1 stone weapon: 1 broad flat axe
- e. 4 bone weapons: 4 bunches of arrowheads (43)

Reference: Zhonguo shehui kexueyuan kaogu yanjiusuo 2007.

2.3 M160, Guojiazhuang, Anyang

Date: late phase of 3rd period of late Shang.

Tomb occupant: excavators suggested that he was head or elite of the ‘zhi’ lineage and a military leader.

Size and structure: bottom 4.56m*2.84m-5.7m, rectangular vertical pit, 1 wooden chamber, 1 wooden coffin, ledged platform, 1 wait pit, 4 human victims, 3 dogs.

Content:

Total: 435 items

- a. Bronzes: 373. Comprised of 44 vessels; 312 weapons; 2 weapon ornaments (1 terminal, 1 *gongxingqi*); 7 tools (including knives); 8 miscellaneous items
- b. Pottery: 16
- c. Jade: 33, including 6 weapons
- d. Bamboo: 1
- e. Stones: 6
- f. Bones: 4
- g. Ivory: 1
- h. Lacquer: 1

Location of objects: most bronze weapons (different types mixed together) were placed inside the *guo* and outside of the coffin; spear heads and arrow heads were mostly in groups; 12 bronze dagger-axes were on the northeast corner of the *ercengtai*. Jades were inside the coffin.

Weapons:

Total 318

- 312 bronze weapons: 91 bunches of arrow heads (906 arrow heads), 3 broad flat axes, 2 hooked-head knives, 119 dagger-axes, 97 spear heads.
 - In particular, 16 dagger-axes with curved tang are all light-weight, thin and fragile, except object no. 7 (incomplete, broken into five pieces, 0.85kg?)
- 6 jade weapons: 1 broad flat axe, 5 dagger-axes.

Reference: Zhonguo shehui kexueyuan kaogu yanjiusuo 1998.

2.4 Houjiazhuang M1004

Date: early phase of the 3rd period of late Shang.

Tomb occupant: possibly a Shang king.

Size and structure: central pit 17.9m*15.9m-12m, with four ramps, 1 *yaokeng*, 1 *guan* 1 *guo*, 4 human victims, 3 dogs.

Condition: it has been looted many times, but one corner of the tomb remains intact and revealed many objects.

Content:

Total: 947

- a. Bronzes: 945. Comprised of 4 vessels; 941 weapons
- b. Jade: 1
- c. Stone: 1

Location of objects:

South part of the vertical pit and the north end of south ramp: 4 layers of objects: weapons in lower 3 layers; top layer stone musical instruments and ritual vessels.

1st layer (bottom): remains of impressions in soil, which excavators suggested were probably leather armour and shields.

2nd layer: 1 human skull, about 141 bronze helmets (not arranged but scattered around), about 370 spearheads (scattered around in the east corner, one with 0.2m of wooden shaft remaining) and 70 dagger-axes mostly on top of helmets in roughly three rows (some have wooden shaft remains with length of 1metre)

3rd layer: 36 bundles of bronze spearheads (10 in a bundle; heads only, all pointed down, no traces of wooden shafts remains- excavators defined these as 'new' weapons), 360 in total.

4th layer: 1 stone musical instrument, 1 jade stick and 4 bronze *ding*-vessels.

Weapons:

Total 941

- 141 bronze helmets
- 730 bronze spears
- 70 bronze dagger-axes

Reference: Shi Zhangru and Gao Quxun 1971.

Appendix 6: Chariots with bronze or/and bone weapons

1. Liangangchang Xinan M3¹

- One of a row of five chariots (M1-M5)
- Inside the chariot box: 30 bronze arrowheads with remains of quivers and shafts; one bronze short sword, northern style (handle-end with open work and incised lines on the handle), the earliest sword in the central plains.²

2. Xiaotun M20-1³

- One stone dagger-axe, 10 stone arrowheads, one bronze dagger-axe, 10 bronze arrowheads (remains of an organic quiver)
- Two grinding stones
- Two bow-shaped object, one bronze knife, one stone tube, one jade tube, one jade loop
- One jade whip handle, some gold foils

3. Xiaotun M20-2⁴

- One group of 10 bronze arrowheads (in a tight group), one group of 10 bronze arrowheads (remains of an organic quiver), one bronze dagger-axe
- One bow-shaped object, two bronze knives,
- 3 jade tubes, some jade ornaments, two grinding stones
- One jade whip handle

¹ Guojia wenwuju 2006, 59-62; Anyangshi wenwu kaogu yanjiusuo 2011.

² Anyangshi wenwu kaogu yanjiusuo 2011, 129.

³ Shi Zhangru 1947, 1970.

⁴ *Ibid.*

4. Xiaotun M40⁵

- 20 bronze arrowheads (in two separate groups), 10 bone arrowheads (in a tight group)
- One grinding stone
- One bronze knife, one bow-shaped object
- A few bone items, one jade loop
- One jade whip handle
- Many bronze horse and chariot ornaments

5. Dasikongcun M175⁶

- One stone dagger-axe, 10 bone arrowheads, 22 bronze arrowheads
- One bronze axe, two bow-shaped object, one bronze knife, one stone adze, one stone awl

6. Baijiafen Xibei M43⁷

- Two bronze dagger-axes, 10 bronze arrowheads in a quiver
- One bow-shaped object, one bronze hammer, one knife, one chisel, one whip handle

7. Dasikongcun M292⁸

- One bronze dagger-axe, 10 arrowheads
- One bow-shaped object, one bronze knife, one adze, one whip handle

⁵ *Ibid.*

⁶ Ma Dezhi et. al 1955.

⁷ Zhongguo shehui kexueyuan kaogu yanjiusuo Anyang gongzuodui 1979.

⁸ Yang Baocheng 2004.

8. Meiyuanzhuang Dongnan M41⁹

- Late phase of late Shang
- 16 bronze arrowheads
- One bronze bow-shaped object, one bronze knife, two bronze adzes, one bronze spade, one bronze chisel, one whip handle
- One bone awl, one bone tube, one animal teeth piece
- One stone hammer
- One shell loop, 1 shell button (ornaments)

9. Guojiazhuang Xinan M146¹⁰

- One bronze arrowhead, one bronze dagger-axe (with shaft, length 25 cm, light and thin- thickness 0.1cm, no weight given, M146:14)
- Many horse and chariot ornaments
- 5 shell loops, one bone tube

10. Guojiazhuang Xinan M147¹¹

- 12 bronze arrowheads, two bronze dagger-axes (with shafts, similar to dagger-axes from M146, thin and light- both thickness 0.2 cm, M147:13 & 14)
- One bow-shaped object, four bone tubes, eight shell loops
- Meiyuanzhuang Dongnan M112
- Two bronze arrowheads

⁹ Zhongguo shehui kexueyuan kaogu yanjiusuo Anyang gongzuodui 1998.

¹⁰ Zhongguo shehui kexueyuan kaogu yanjiusuo 1998.

¹¹ *Ibid.*

¹² Anyangshi wenwu gongzuodui 1997.

- One bone plate, one bone loop, one gold foil, two bone items

11. 2006 Saigejindi CK1¹³

- One chariot and two horses
- Wheel width 1.8m; chariot box 1.22m*0.92
- 23 cowries, 18 bronze arrowheads and 1 bone ring and 1 bronze tube were found inside the box
- 11 bone and 22 bronze arrowheads were found outside the front of the box.

12. Anyang 120 Zhuanlu Fushu Gongdi M3¹⁴

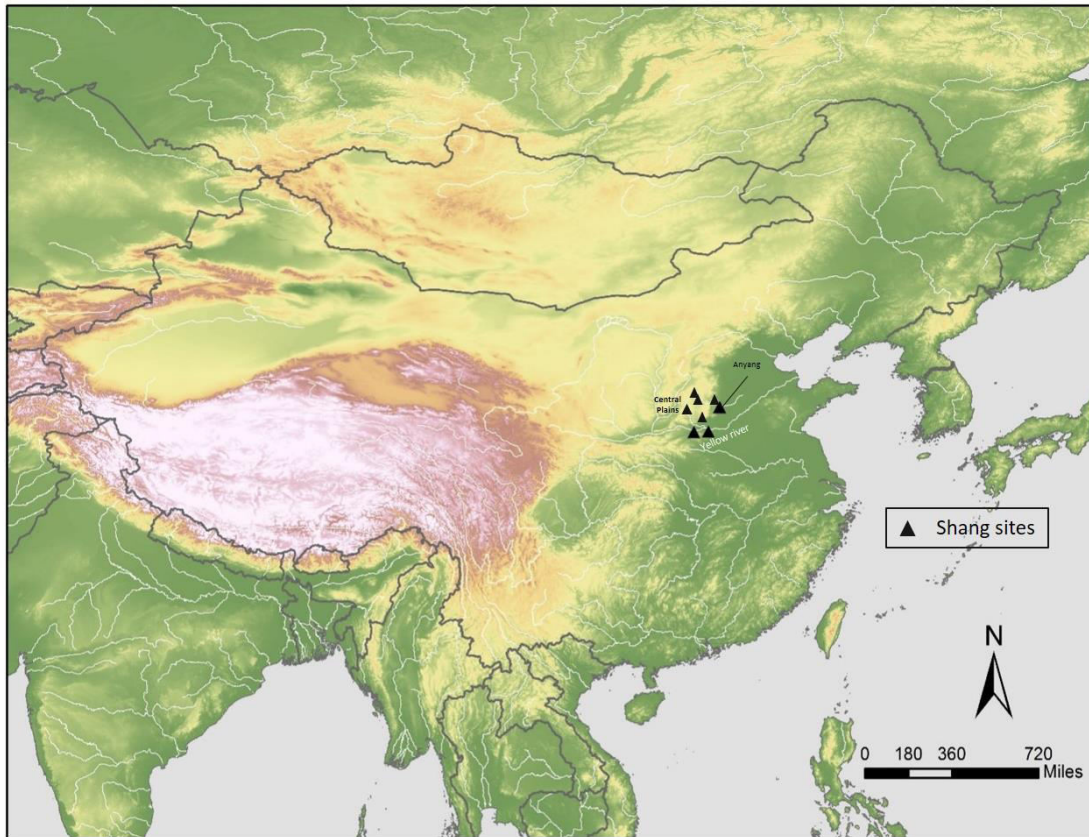
- One of a row of 5 chariots
- Inside the chariot box: 30 bronze arrowheads with remains of quivers and shafts; one bronze short sword, the earliest sword in the central plains.¹⁵

¹³ Anyangshi wenwu kaogu yanjiusuo 2011.

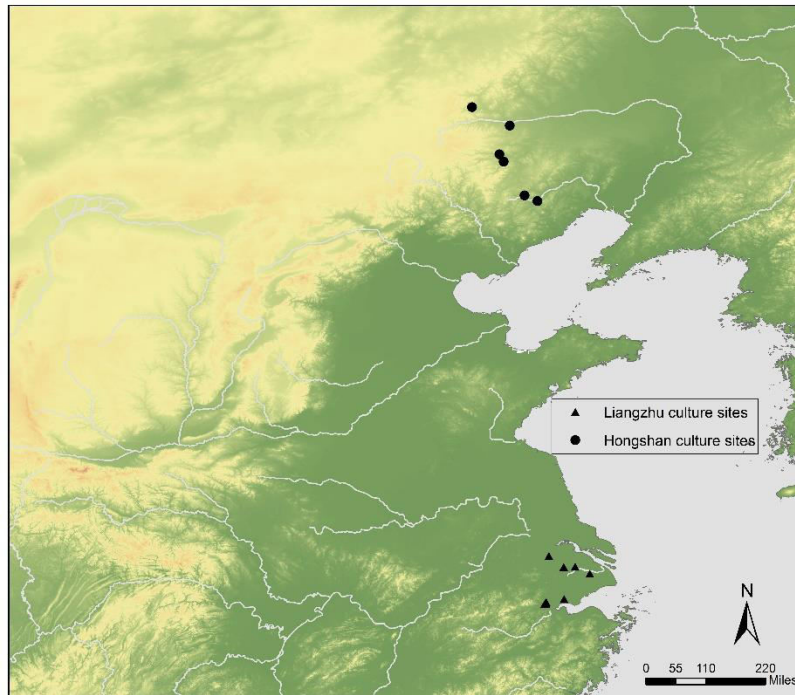
¹⁴ *Ibid.*

¹⁵ *Ibid*, 129.

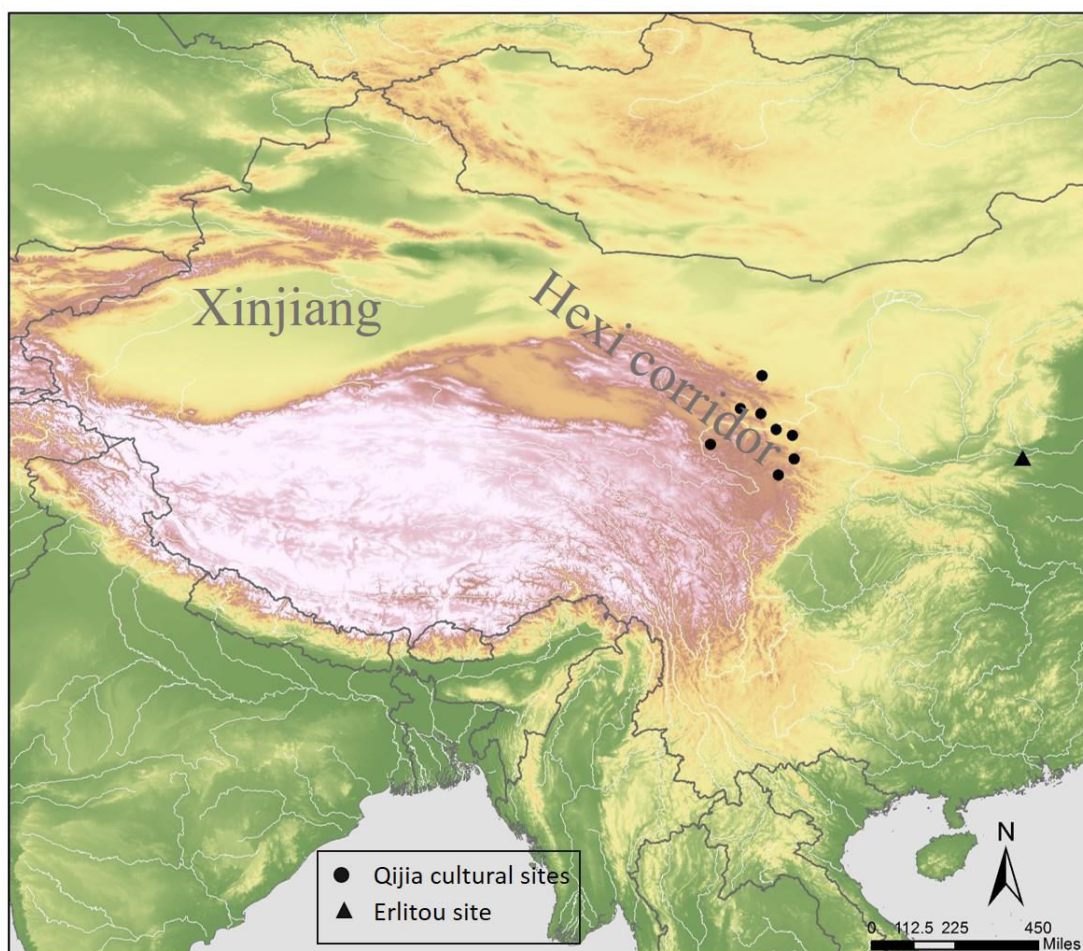
Maps



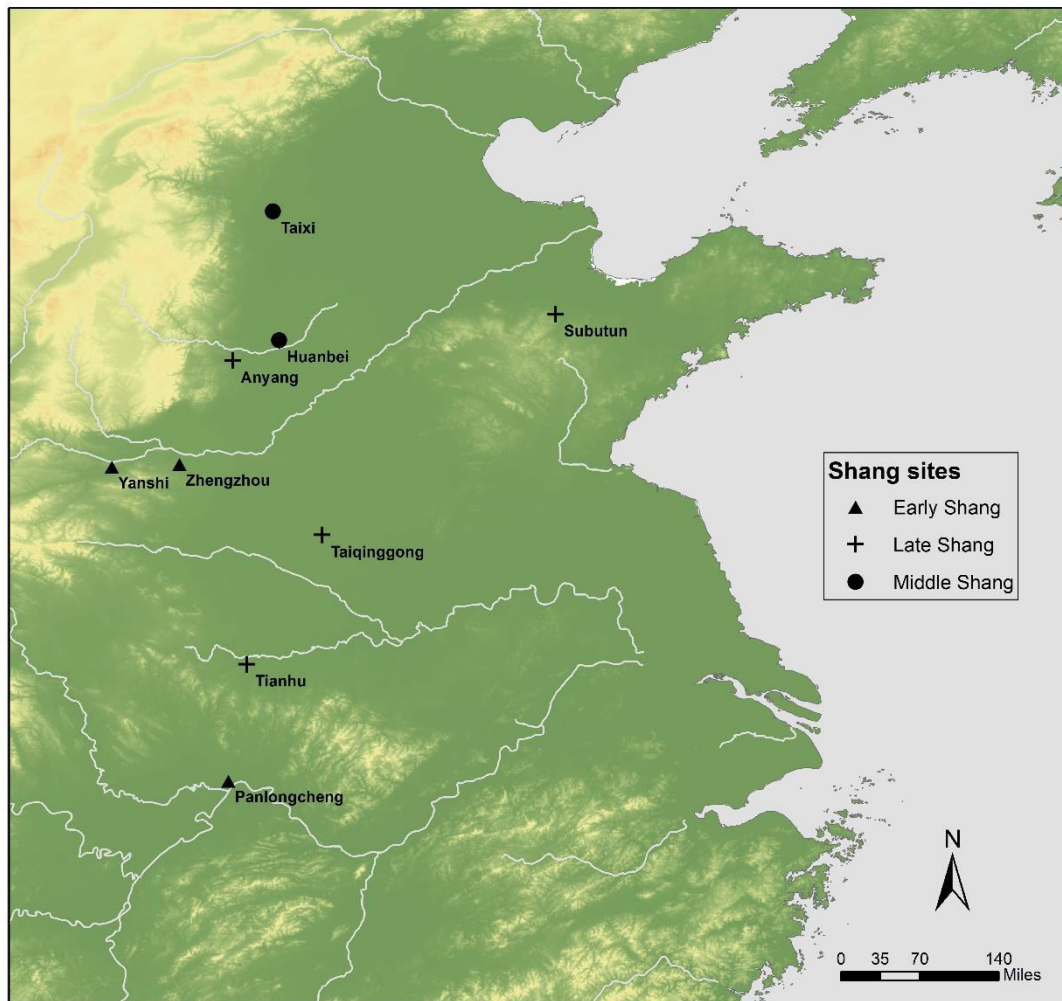
Map 1 The Central Plains and Anyang



Map 2 Distribution areas of Hongshan and Liangzhu sites



Map 3 Qijia and Erlitou sites



Map 4 Shang sites

Tables

Neolithic	early		c. 7000-5000 B.C.
	middle		c. 5000- 3000 B.C.
	late		c. 3000-2000 B.C.
Erlitou 二里头	type site: Yanshi 偃师, Henan 河南 province		c.1750-1530 B.C.
Shang 商	early Shang (type site: Zhengzhou 郑州, Henan province)		c.1600-1300 B.C.
	middle Shang (type site: Huanbei 洹北, Henan province)		c.1300-1200 B.C
	late Shang (type site: Anyang 安阳, Henan province)		c.1200-1050 B.C.
Zhou 周	Western Zhou 西周		c.1050-771 B.C.
	Eastern Zhou 东周	Spring and Autumn	770-481 B.C.
		Warring States	480-220 B.C.

Table 1.1 Chronology of Neolithic to Eastern Zhou (after Liu Li and Chen Xingcan 2012, x, 216, 222; Zhang Xuelian et al. 2005; Li Feng 2006, xvii)

	bronze	jade	bone	shell	stone	leather
dagger-axes (<i>ge</i> 戈)	√	√	√	√	√	
spearheads (<i>mao</i> 矛)	√	√				
broad flat axes (<i>yue</i> 鉞)	√	√			√	
hooked-head knives	√					
curved-spine knives	√	√				
arrowheads (<i>zu</i> 鏃)	√	√	√		√	

Table 1.2 Weapons and military equipment of various types and materials

Approaches	Artefact studies		Archaeometallurgy and archaeometry			Experimental archaeology		
	typology	macro or micro metalwork wear analysis	compositional analysis (XRF, EPMA, EDX, AGLAE or NRCA)	metallography (SEM)	radiography (X-ray and 3D-CT)	re-production	re-enactment (re-enactor or Rosand test machine)	hardness test
Bridgford 2000	√	√	√	√		√	√	√
Davis 2006	√					√	√	
Modlinger 2011	√	√		√	√			
Colquhoun 2011	√	√						
Boulud-Gazo 2011	√		√		√			
Roberts and Ottaway 2003		√				√	√	
Postama et al. 2011			√					
O’Flaherty et al. 2011		√				√	√	
Picardo and Temelkoski 2011		√	√	√				

Table 2.1 A list of methods on weaponry studies in Europe

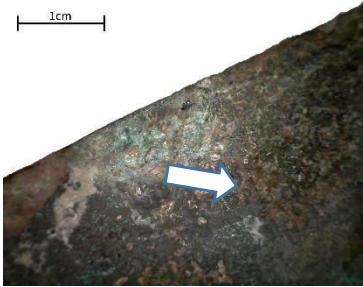
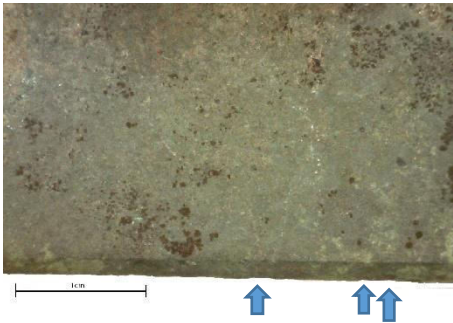
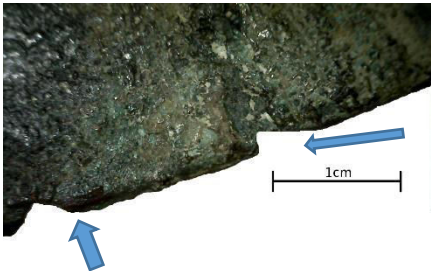
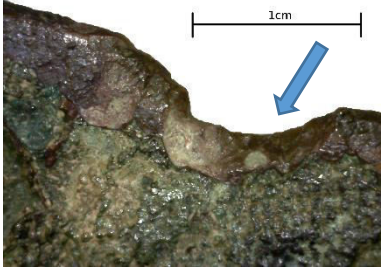
Terms	Images
Scratch: a shallow long mark on the surface (e.g. #2)	
Nick: a very small cut which usually takes u-shaped forms. It involves a small amount of material loss on the edge (e.g. #4).	
V-shaped notch: a clearly defined v-shaped cut, with a moderate amount of metal loss (e.g. #6).	
U-shaped notch: a clearly defined U-shaped cut, with a moderate amount of metal loss (e.g. #6).	
Crack: a line that penetrates the surface but does not cut through to the other side (e.g. #7).	

Table 5.1 Terminology with photographs of the marks described

Object name and number	Manufacture	Wear and tear	Depositional treatment	Post-excavation changes
dagger-axe 1880,0802.85		√		
dagger-axe 1915,0409.100	√	√		√
dagger-axe 1932,1014.19	√	√	√	√
dagger-axe 1932,1014.20	√	√		
dagger-axe 1933,0413.11	√	√		
dagger-axe 1936,1118.36		√	√	
curved-spine knife 1945,1017.189	√	√		√
Broad flat axe 1947,0712.413		√		
dagger-axe 1948,0716.40				√
spearhead 1953,1215.2	√	√		√
dagger-axe 1953,1215.1 shaft, turquoise	√	√		
hooked-head knife 1981,1117.1	√	√		

Table 5.2 Observations of various types of marks on weapons in the British Museum collection

Types of moulds	Tools	Weapons	Vessels	Unknown
Quantity	50	7	8	60
Percentage	40%	5.6%	6.4%	48%

Table 6.1 An overview of clay moulds found at the Nanguanwai workshop during the 1st phase of the early Shang (Henansheng wenwu kaogu yanjiusuo 2001, Table 10, 346)

Type IVA	N=	Mean	SD	CV
Length	72	24.8861	0.42734	0.02
Weight	72	303.61	26.153	0.09

Table 6.2 Average (in cm), standard deviation (SD) and coefficients of variation (CV, %) for length and weight of 72 IVA type dagger-axes

Type IVB	N=	Mean	SD	CV
Length	27	24.9556	0.46767	0.02
Weight	27	465.1852	27.50809	0.09

Table 6.3 Average (in cm), standard deviation (SD) and coefficients of variation (CV, %) for length and weight of 27 IVB type dagger-axes

Type IVC	N=	Mean	SD	CV
Length	9	24.9889	1.0080	0.04
Weight	9	402.222	35.62926	0.09

Table 6.4 Average (in cm), standard deviation (SD) and coefficients of variation (CV, %) for length and weight of 9 IVC type dagger-axes

Phases	Elite tombs	Guojiazhuang cemetery
1 st phase	7	0
2 nd phase	29	11
3 rd phase	46	35
4 th phase	37	40
Uncertain	2	5
Total	121	91

Table 7.1 Chronological phases of elite and Guojiazhuang lineage tombs in the databases

phases	volumes	human victims	dogs	total goods	ceramics	bronzes	bronze vessels	jade
2 nd	17.35	1	1.26	20.85	3.93	12.93	4.85	2.07
3 rd	15.55	0.11	0.96	16.64	2.91	11	4.07	1.16
4 th	17.41	0.46	1.19	38.57	6.78	21.16	6.32	1.97

Table 7.2 Elite tombs: mean numbers of other variables from phase 2 to 4

Phases	volumes	dogs	total goods	ceramics	bronze vessels	jade
2 nd	6.86	0.82	5	2.27	0.36	0.09
3 rd	6.38	0.76	5.1	2.85	0.29	0.21
4 th	6.48	0.48	8.03	3.83	0.58	0.4

Table 7.3 Guojiazhuang cemetery: mean numbers of other variables from phase 2 to 4

Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Weapons	.391	121	.000	.284	121	.000

a. Lilliefors Significance Correction

Table 7.4 Elite tombs: normality test of quantities of weapons

Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Weapons	.459	91	.000	.100	91	.000

a. Lilliefors Significance Correction

Table 7.5 Guojiazhuang lineage tombs: normality test of quantities of weapons

Correlations										
			Volume	HumanVic	Dogs	BVessels	Sets	Jade	BWeapons	JWeapons
Spearman's rho	Volume	Correlation Coefficient	1.000	.245**	.228*	.415**	.357**	.177	.464**	.151
		Sig. (2-tailed)	.	.007	.013	.000	.000	.055	.000	.104
		N	118	118	118	118	118	118	118	118
	HumanVic	Correlation Coefficient	.245**	1.000	.392**	.505**	.509**	.406**	.365**	.222*
		Sig. (2-tailed)	.007	.	.000	.000	.000	.000	.000	.016
		N	118	118	118	118	118	118	118	118
	Dogs	Correlation Coefficient	.228*	.392**	1.000	.333**	.278**	.370**	.225*	.337**
		Sig. (2-tailed)	.013	.000	.	.000	.002	.000	.014	.000
		N	118	118	118	118	118	118	118	118
	BVessels	Correlation Coefficient	.415**	.505**	.333**	1.000	.716**	.421**	.498**	.255**
		Sig. (2-tailed)	.000	.000	.000	.	.000	.000	.000	.005
		N	118	118	118	118	118	118	118	118
	Sets	Correlation Coefficient	.357**	.509**	.278**	.716**	1.000	.372**	.434**	.273**
		Sig. (2-tailed)	.000	.000	.002	.000	.	.000	.000	.003
		N	118	118	118	118	118	118	118	118
	Jade	Correlation Coefficient	.177	.406**	.370**	.421**	.372**	1.000	.362**	.624**
		Sig. (2-tailed)	.055	.000	.000	.000	.000	.	.000	.000
		N	118	118	118	118	118	118	118	118
	BWeapons	Correlation Coefficient	.464**	.365**	.225*	.498**	.434**	.362**	1.000	.214*
		Sig. (2-tailed)	.000	.000	.014	.000	.000	.000	.	.020
		N	118	118	118	118	118	118	118	118
	JWeapons	Correlation Coefficient	.151	.222*	.337**	.255**	.273**	.624**	.214*	1.000
		Sig. (2-tailed)	.104	.016	.000	.005	.003	.000	.020	.
		N	118	118	118	118	118	118	118	118

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 7.6 Correlation tests between weapons and other variables in 118 elite tombs

Correlations			Volume	Dogs	BVessels	Sets	Jade	BWeapons
Spearman's rho	Volume	Correlation Coefficient	1.000	.337**	.293**	.286**	.259*	.257*
		Sig. (2-tailed)	.	.001	.005	.006	.014	.014
		N	90	90	90	90	90	90
	Dogs	Correlation Coefficient	.337**	1.000	.255*	.250*	.111	.292**
		Sig. (2-tailed)	.001	.	.015	.018	.298	.005
		N	90	90	90	90	90	90
	BVessels	Correlation Coefficient	.293**	.255*	1.000	.999**	.441**	.487**
		Sig. (2-tailed)	.005	.015	.	.000	.000	.000
		N	90	90	90	90	90	90
	Sets	Correlation Coefficient	.286**	.250*	.999**	1.000	.434**	.479**
		Sig. (2-tailed)	.006	.018	.000	.	.000	.000
		N	90	90	90	90	90	90
	Jade	Correlation Coefficient	.259*	.111	.441**	.434**	1.000	.346**
		Sig. (2-tailed)	.014	.298	.000	.000	.	.001
		N	90	90	90	90	90	90
	BWeapons	Correlation Coefficient	.257*	.292**	.487**	.479**	.346**	1.000
		Sig. (2-tailed)	.014	.005	.000	.000	.001	.
		N	90	90	90	90	90	90

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Table 7.7 Correlation tests between weapons and other variables in Guojiashuang tombs

Tomb	Locations of weapons
59 Wuguan M1	Dagger axes and one knife placed around deceased's head
80 Sikong M539	Exact location of weapons unknown due to the perishing and collapse of coffin and chamber. Generally placed around upper body
83 Sikong M663	A few weapons were placed around the body: one dagger-axe near the shoulder, one spearhead near the chest, one dagger-axe and spearhead near the arm and flat axe-blade near the waist. Most are outside the coffin, inside the chamber.
86 Sikong M25	All dagger-axes were placed around the head of the deceased. Broad flat axe found together with bronze vessels near waist
86 Sikong M29	One dagger-axe near the foot of the deceased, one near the leg, and one near the chest. Other three on the ledge
80-82 Miaobei M80	One dagger-axe near the chest of the deceased

80-82 Miaobei M54	One dagger-axe and one spearhead on either side of the deceased's head
83 Guonan M1	One dagger-axe and one spearhead were placed next to right side of the deceased's head
83 Xuedongnan M3	All dagger-axes except one were placed around the upper body of the deceased: head, shoulders, chest, waist and arms; one was on the ledge
91 Hougang M33	Two bronze dagger-axes on the deceased's waist; two near the head; bronze and bone arrowheads near the left leg.
85 Tijiakou M3	One bronze dagger-axe near the deceased's right arm
85 Liunan M59	One bronze dagger-axe on the top of the face, probably fell from coffin lid. One bronze dagger-axe has traces of shaft, and is positioned on the left arm as if being held
85 Liunan M14	One bronze dagger-axe was placed near the left arm; bronze arrowheads were near the feet; bone arrowheads were placed between the legs
95 Huayuanzhuang M42	Dagger-axes on either sides of the shoulder and near the head
Xiqu M269	bronze dagger-axes and arrowheads were near the shoulder; stone dagger-axe near the head
80 Sanjiazhuang M1	One broad flat axe and 1 dagger-axe were around the head; bone arrowheads were near the feet.
Wenyuanlüdao M45	Two bronze dagger-axes near the deceased's shoulder; one near the right leg; 1 stone dagger-axe inside the wait pit and one inside chamber outside coffin
Wenyuanlüdao M79	Two bronze dagger-axes near the deceased's waist; one outside coffin and inside chamber
Saigejindi M13	Weapons were around the deceased's right arm and near the head

Table 7.8 Distributions of weapons in coffins

Periods	Object number	Length (cm)	Width (cm)	Weight (kg)
Early Shang	PLZM2:15	41.4	26.7	3.85
Late Shang	Huayuanzhuang M54:86	40.5	29.8	5.96
Late Shang	Guojiazhuang M160:110	33.2	28	3.6
Late Shang	Fuhao M5:799	39.5	37.3	9
Late Shang	Fuhao M5:800	39.3	38.5	8.5
Late Shang	Huayuanzhuang M54:86	40.5	29.8	5.96
Late Shang	Subutun M1	34.5	23.3	n/a
Late Shang	Guojiazhuang Dongnan M26:15	33.4	25	n/a

Table 7.9 Execution-axes: metric data

Tomb	Condition	Bronze cymbals	Bronze weapons	Reference
Xiqu M699	looted	3	11	Zhongguo shehui kexueyuan kaogu yanjiusuo Anyang gongzuodui 1979
58 Sikong M51	complete	3	12	Ma Dezhi et al. 1951
Dasikong M312	looted	3	11	Ma Dezhi et al. 1951
Dasikong M663	complete	3	20	Zhongguo shehui kexueyuan kaogu yanjiusuo Anyang gongzuodui 1988
04 Dasikong M303	complete	3	76	Zhongguo shehui kexueyuan kaogu yanjiusuo Anyang gongzuodui 2008
Gaolouzhuang M8	complete	3	11	Zhou Dao and Liu Dongya 1963
Guojiazhuang M160	complete	3	312	Zhongguo shehui kexueyuan kaogu yanjiusuo 1998
95 Guojiazhuang Dongnan M26	complete	3	24	Zhongguo shehui kexueyuan kaogu yanjiusuo Anyang gongzuodui 1998

Huayuanzhuang M54	complete	3	249	Zhongguo shehui kexueyuan kaogu yanjiusuo 2007
84 Qijiazhuang Dongnan M269	complete	3	29	Anyangshi wenwu gongzuodui 1991
Xiaotun M5	complete	5	111	Zhongguo shehui kexueyuan kaogu yanjiusuo 1980

Table 7.10 Late Shang tombs with cymbals (n=12)



Figure 1.1 Simuwu caldron¹

¹ Available from the National Museum of China website
<http://www.chnmuseum.cn/Default.aspx?TabId=212&AntiqueLanguageID=845&AspxAutoDetectCookieSupport=1> (accessed 29th July 2016). © National Museum of China.

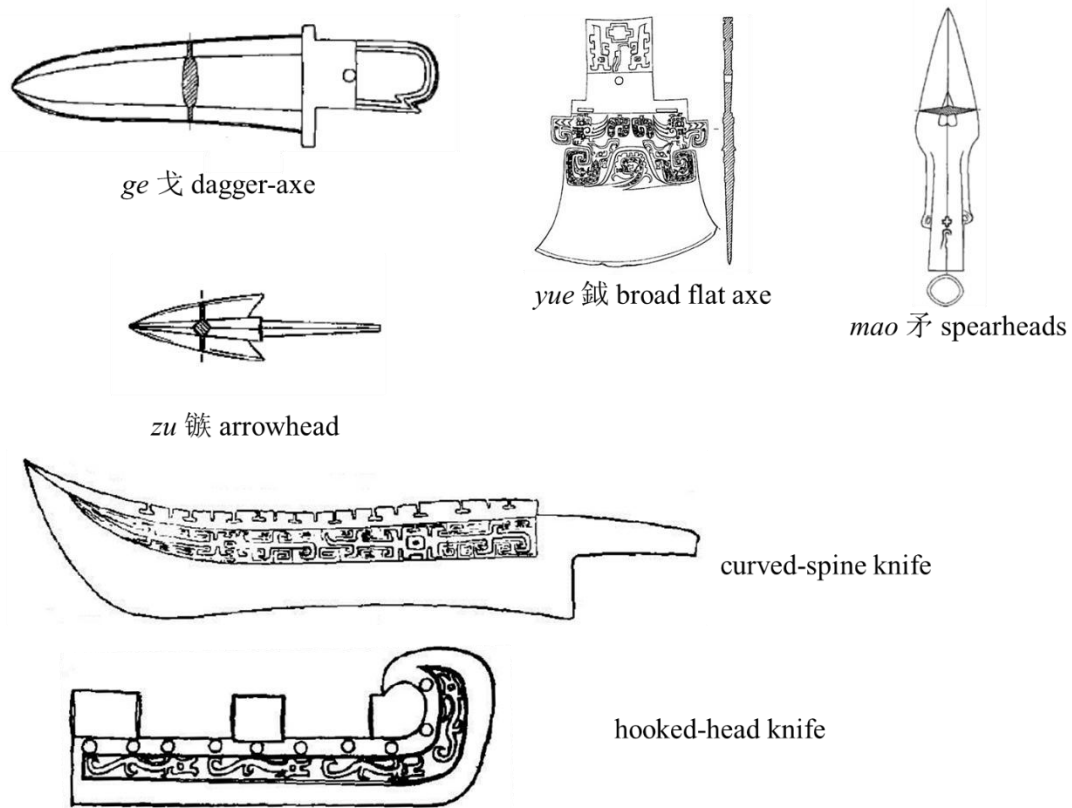


Figure 1.2 An illustration of bronze weapons by types (dagger-axe, see Zhongguo shehui kexueyuan kaogu yanjiusuo 2007, Figure 111.2, 145; spearhead, see Zhongguo shehui kexueyuan kaogu yanjiusuo 2007, Figure 106.1, 140; arrowhead, see Zhongguo shehui kexueyuan kaogu yanjiusuo 2007, Figure 119.3, 157; broad flat axe, see Zhongguo shehui kexueyuan kaogu yanjiusuo 2007, Figure 103.2, 137; curved-spine knife, see Liu Yiman 1993, Figure 5.2, 153; hooked-head knife, see Liu Yiman 1993, Figure 7.3, 154)



Figure 2.1 Jade *yue*-axe with small jade beads (after Zhejiangsheng wenwu kaogu yanjiusuo Fanshan kaogudui 2005, Figure 83, 102)

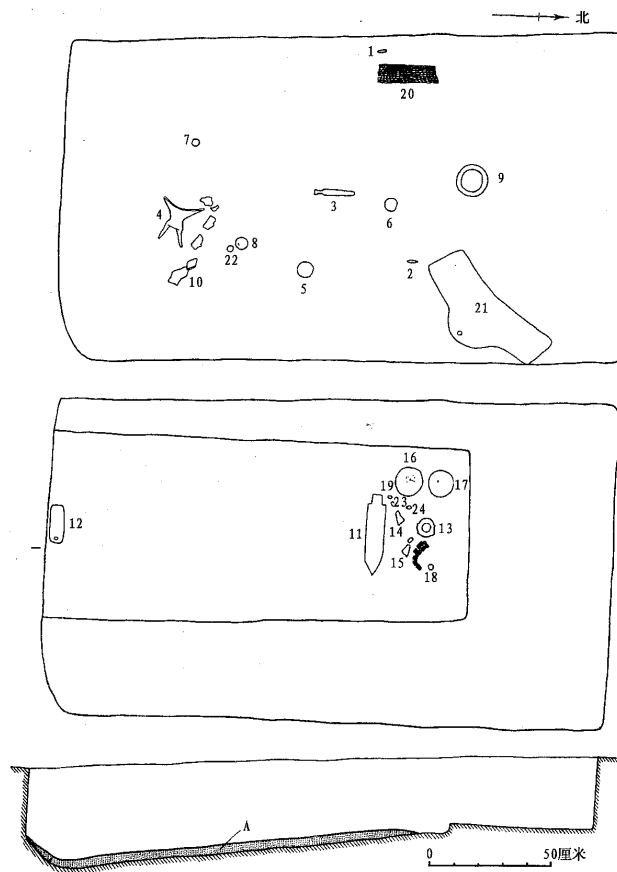


Figure 2.2 Layout of VIKM3 with content at Erlitou site, Henan province (Zhongguo shehui kexueyuan kaogu yanjiusuo 1999, 242)

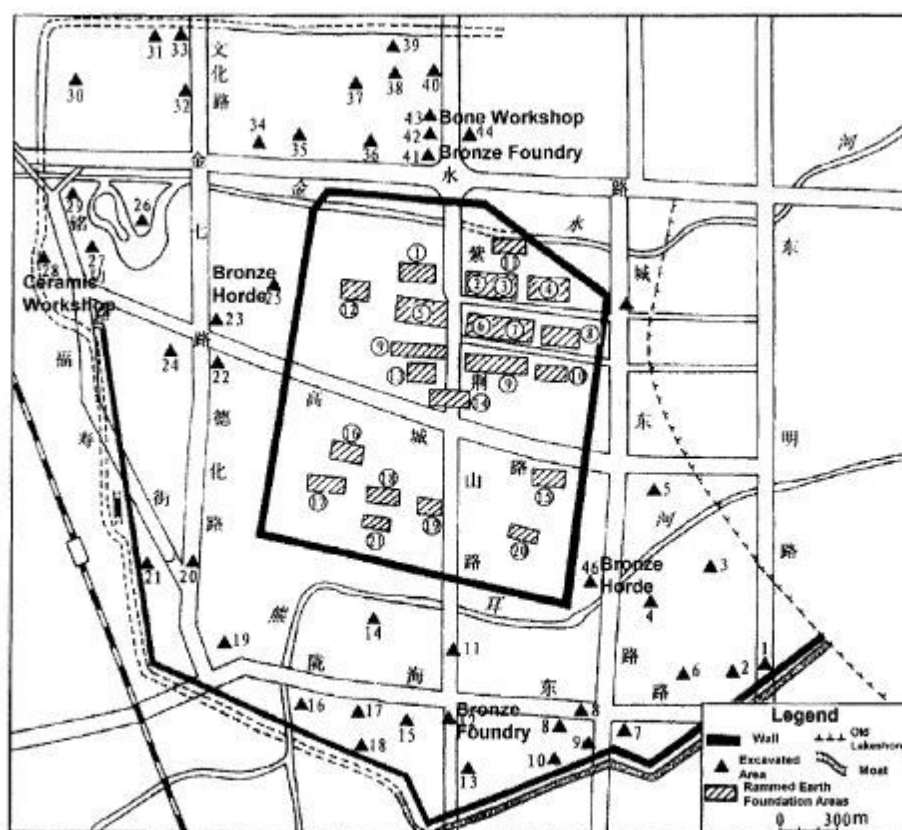


Figure 2.3 Zhengzhou site (Yuan and Zeng 2004, Figure 1, 60; quoted from Campbell 2007,

325)

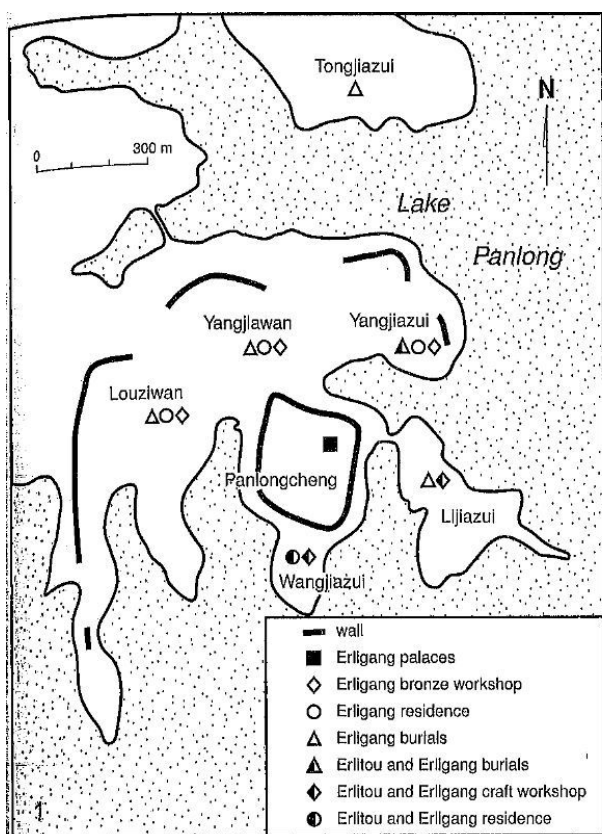


Figure 2.4 Panlongcheng site

(Liu Li and Chen Xingcan 2012, 287)

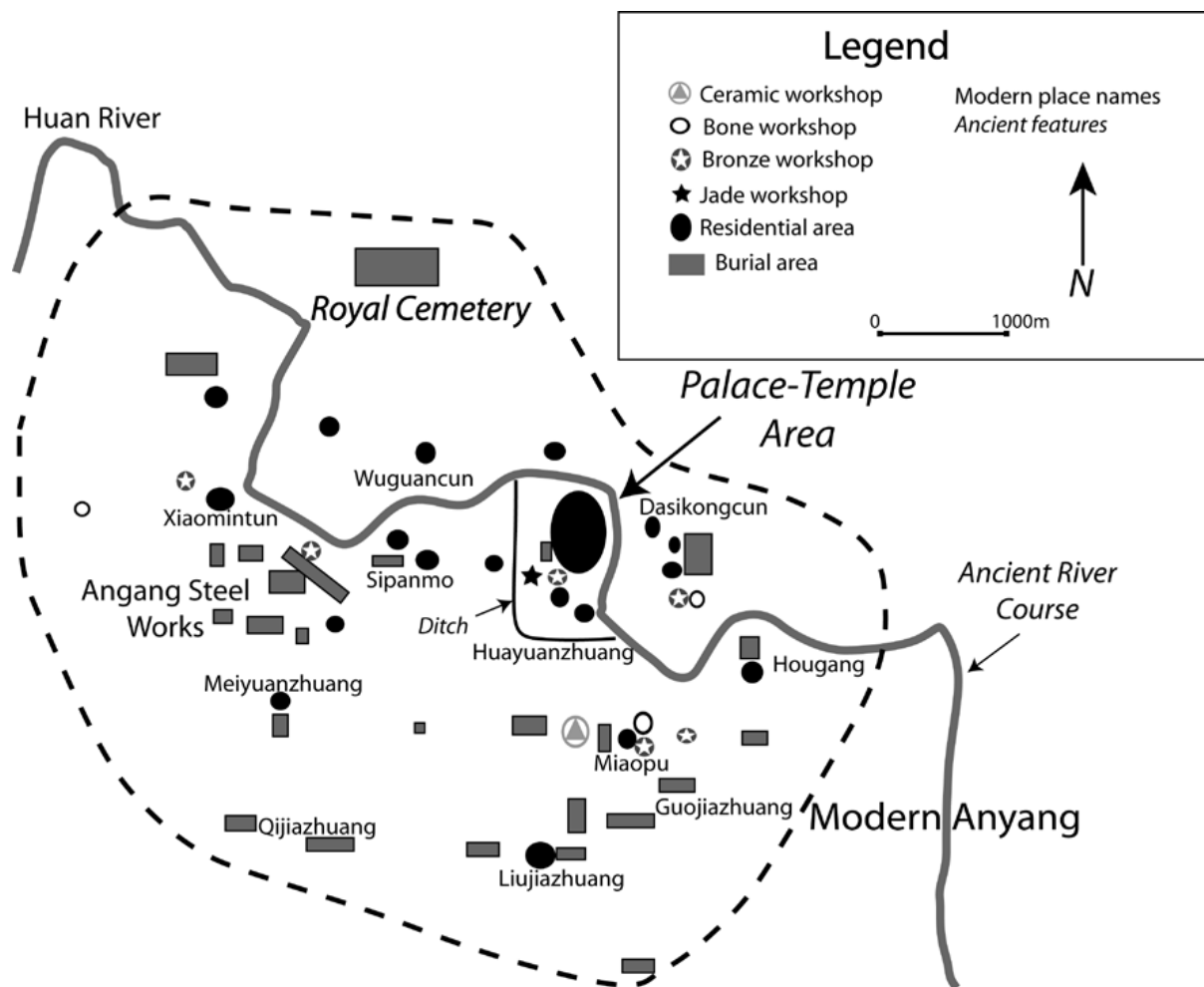


Figure 2.5 Anyang site (Campbell 2014, Figure 5.2, 131)

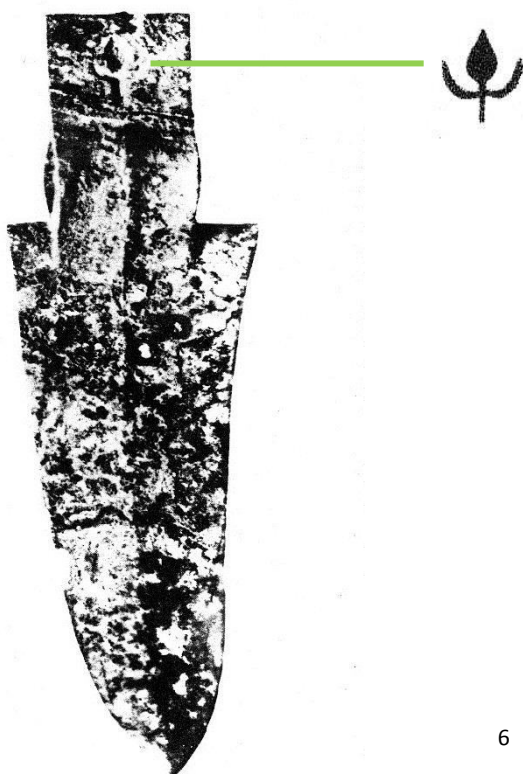


Figure 2.6 A dagger-axe with terminal presented as part of inscriptions of a Shang bronze from the Shanghai Museum collection (Yinzhong Jinwen Jicheng 1984-1994, vol. 6, no. 10729.1, 285).

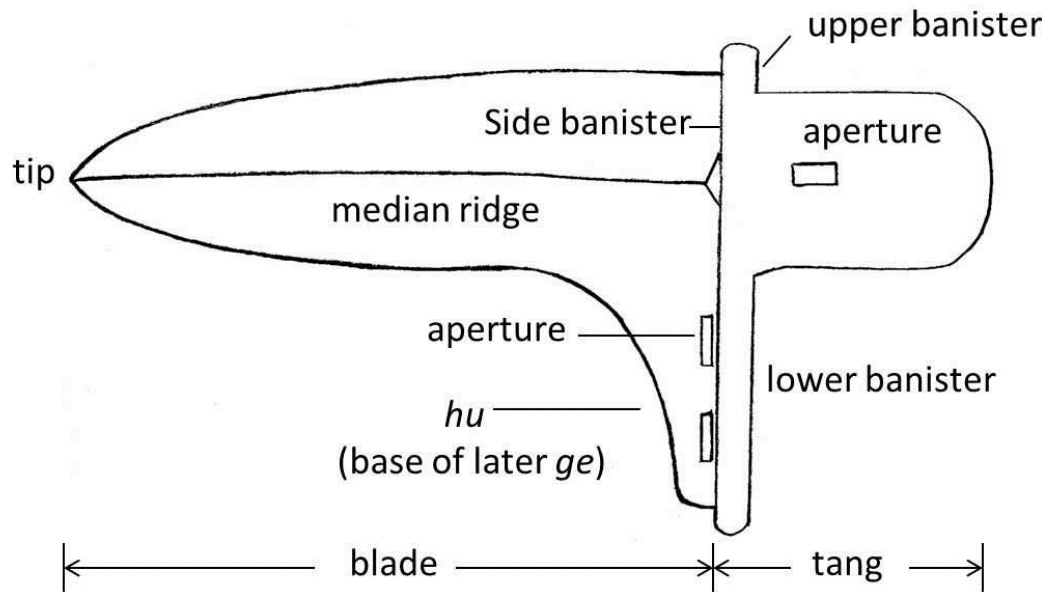


Figure 2.7 Dagger-axe illustration (adapted from Guo Baojun 1961, Figure 1, 111)

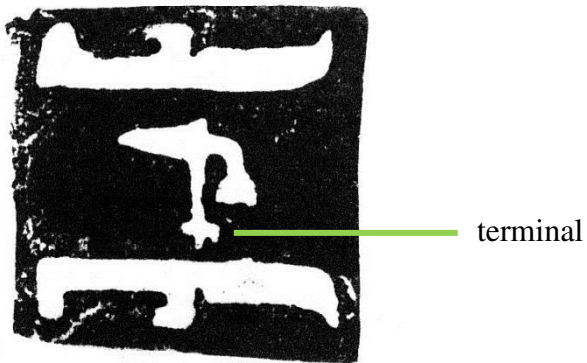


Figure 2.8 An inscribed *ge* 戈 from M1004, Houjiazhuang, Anyang (Yinzhou Jinwen Jicheng 1984-1994, vol.17, no. 10604).

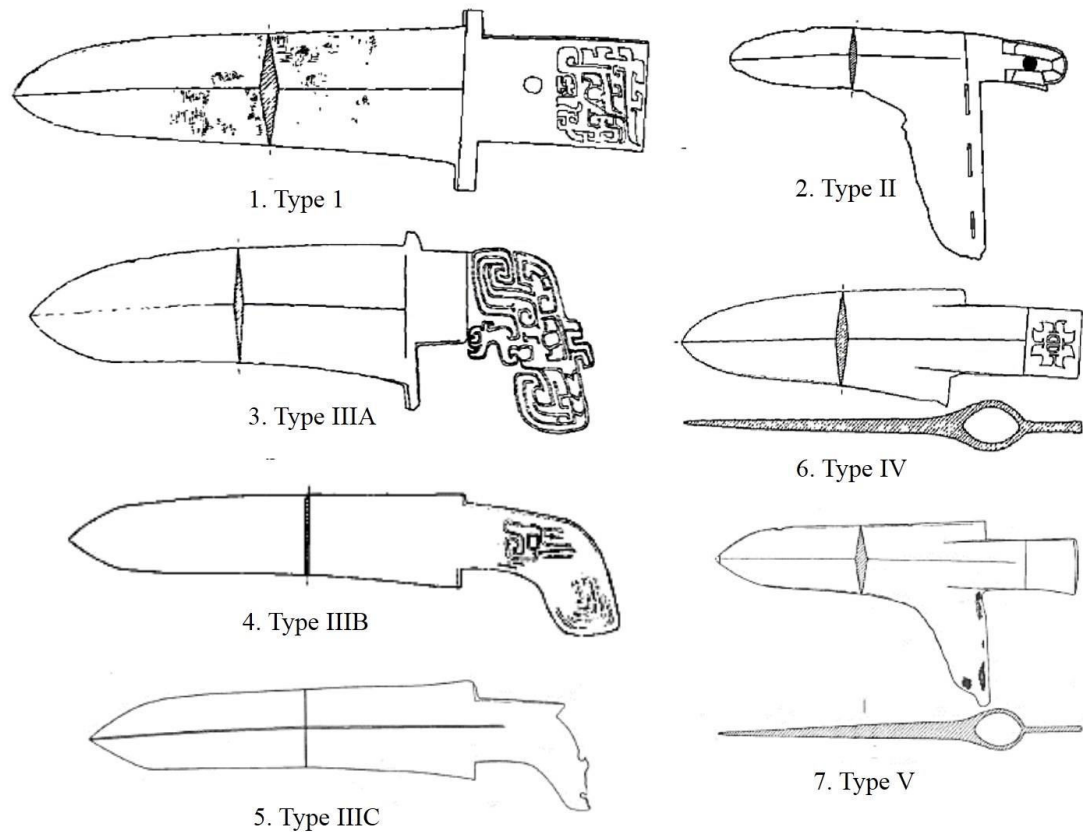


Figure 2.9 Five types of dagger-axes (1. M26:3, after Zhongguo shehui kexueyuan kaogu yanjiusuo Anyang gongzuodui 1998, Figure 20.2, 45; 2. M54:197, Zhongguo shehui kexueyuan kaogu yanjiusuo Anyang gongzuodui 2004, Figure 12.2, 16; 3. M26:58, after Zhongguo shehui kexueyuan kaogu yanjiusuo Anyang gongzuodui 1998, Figure 20.3, 45; 4. M160:42, after Zhongguo shehui kexueyuan kaogu yanjiusuo 1998, Figure 83.3, 107; 5. M303:27, after Zhongguo shehui kexueyuan kaogu yanjiusuo Anyang gongzuodui 2008, Figure 30.9, 379; 6. M26:3, after Zhongguo shehui kexueyuan kaogu yanjiusuo Anyang gongzuodui 1998, Figure 20.2, 55; 7. M303:103, after Zhongguo shehui kexueyuan kaogu yanjiusuo Anyang gongzuodui 2008, Figure 30.1, 379)

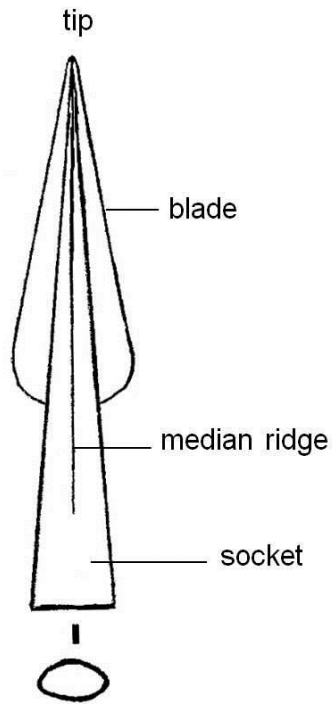


Figure 2.10 An illustration of a spearhead (adapted from Guo Baojun 1961, Figure 13, 112).

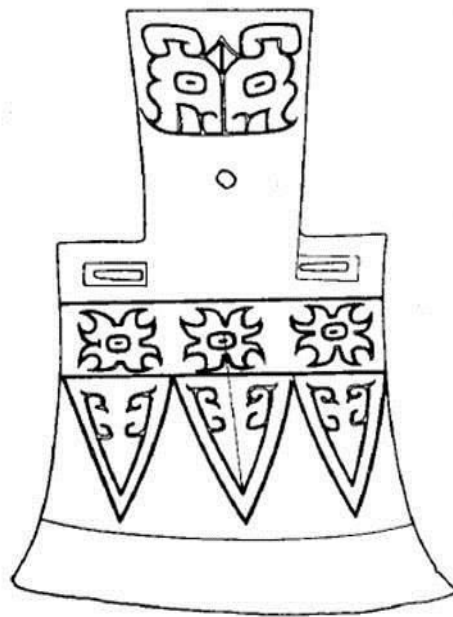


Figure 2.11 Bronze broad flat axe from M160, Guojiazhuang, Anyang, late Shang (Zhongguo Shehui Kexueyuan Kaogu Yanjiusuo 1998, Figure 82.1, 106)



Figure 3.1 Tang dynasty tomb figures, British Museum²

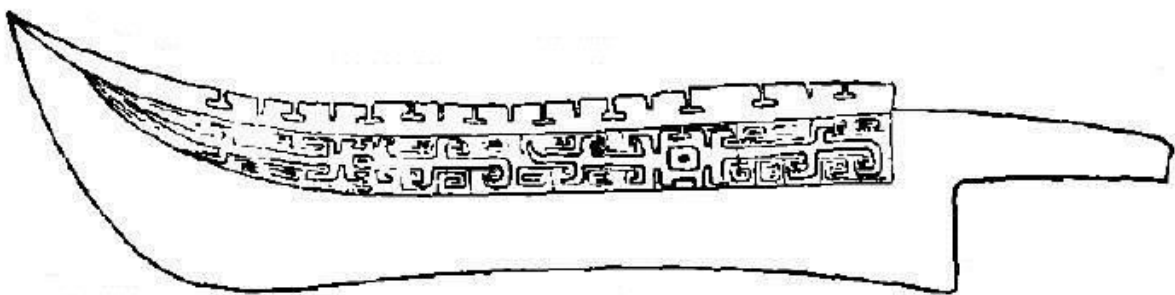


Figure 3.2 Drawing of M5:1169 (Liu Yiman 1993, Figure 7.3, 154)

² Available from the British Museum website
http://www.britishmuseum.org/collectionimages/AN00035/AN00035356_001_l.jpg (accessed 29th May 2015).
© The Trustees of the British Museum.



Figure 5.1 A section of 1915,0409.100 showing sharp cutting edge and striations (author's photo)

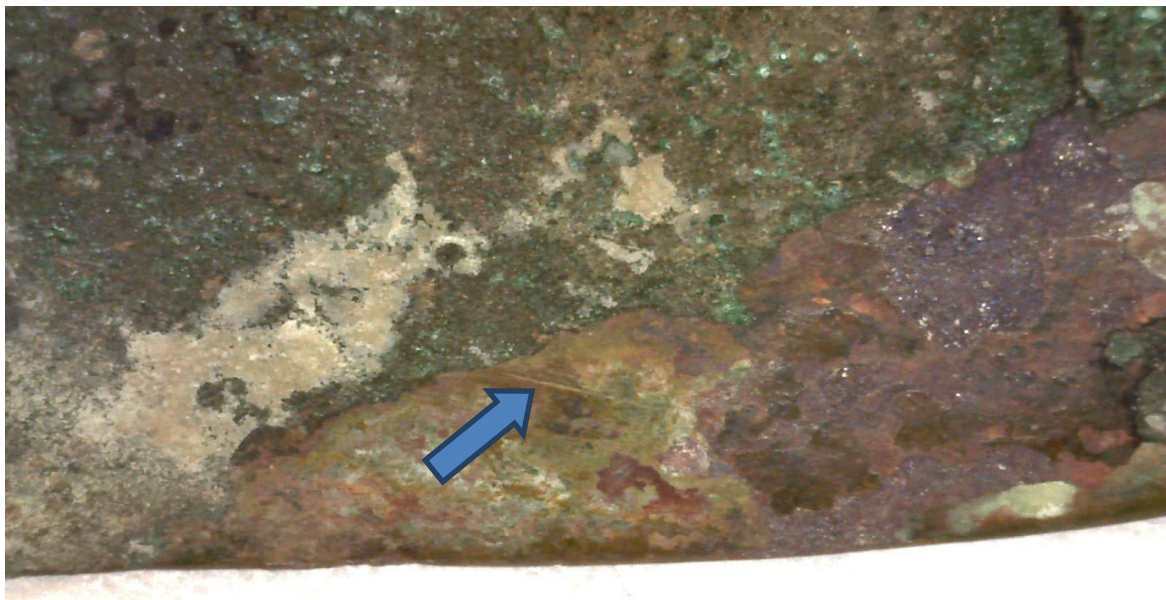


Figure 5.2 A scratch on the blade body of 1915,0409.100 (author's photo)



Figure 5.3 Incised inscriptions on dagger-axe 1948,0716.40 (author's photo)



Figure 5.4 Arrows pointing at possible penetration of incised line over corrosion products (author's photo)

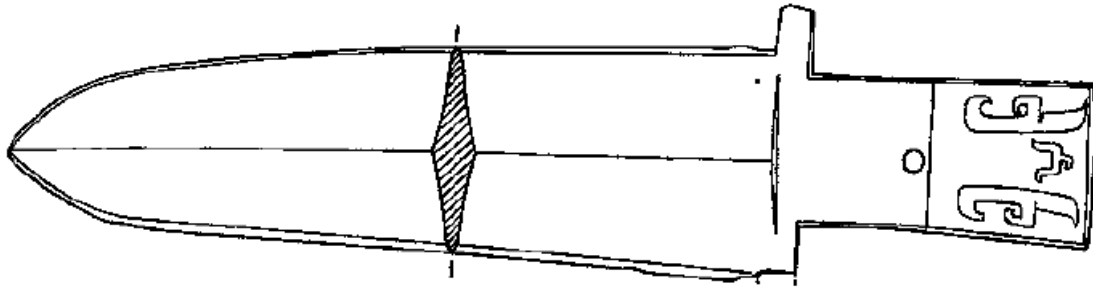


Figure 5.5 Dagger-axe M54:126 from Huayuanzhuang M54 with the inscription ‘𠄎’ (after Zhongguo shehui kexueyuan kaogu yanjiusuo 2007, Figure 111.1, 145)

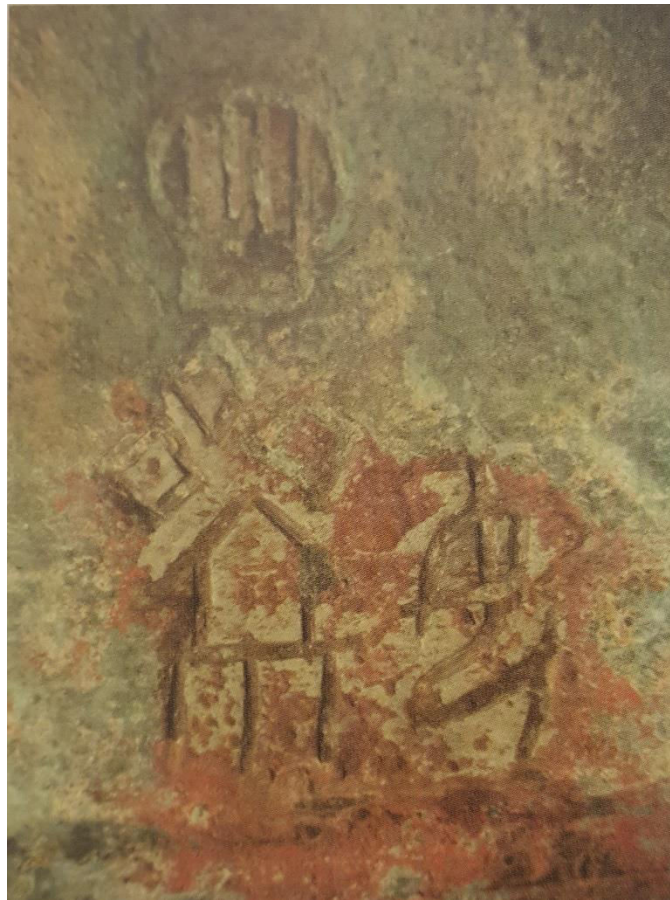


Figure 5.6 Incised inscription in the foot ring of a *zun* (Strahan and Fenn 2007, Figure 6, 28)

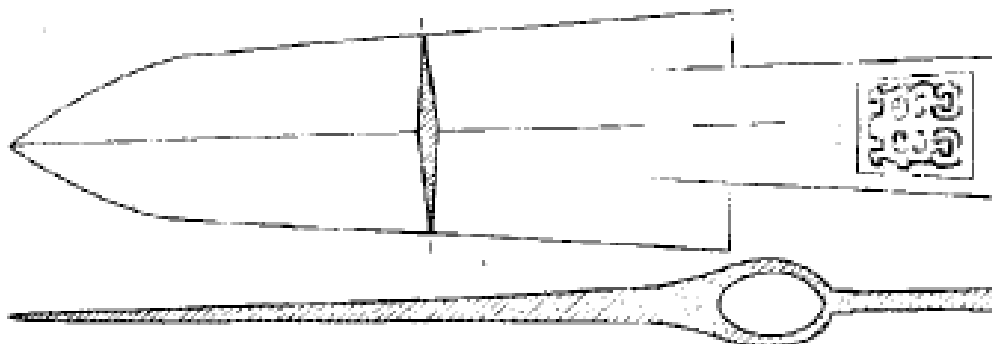


Figure 6.1 Dagger-axe type IVA from Guojiazhuang M160 (Zhongguo shehui kexueyuan kaogu yanjiusuo 1998, Figure 84.7, 108)

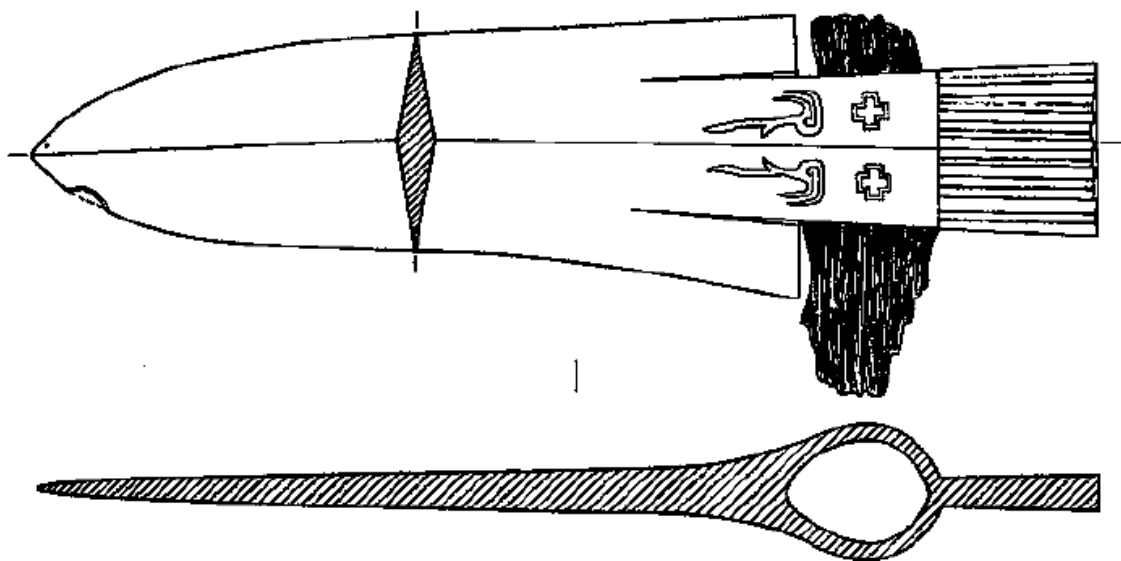


Figure 6.2 Dagger-axe type IVB from Huayuanzhuang M54 (Zhongguo shehui kexueyuan kaogu yanjiusuo 2007, Figure 114.1, 149)

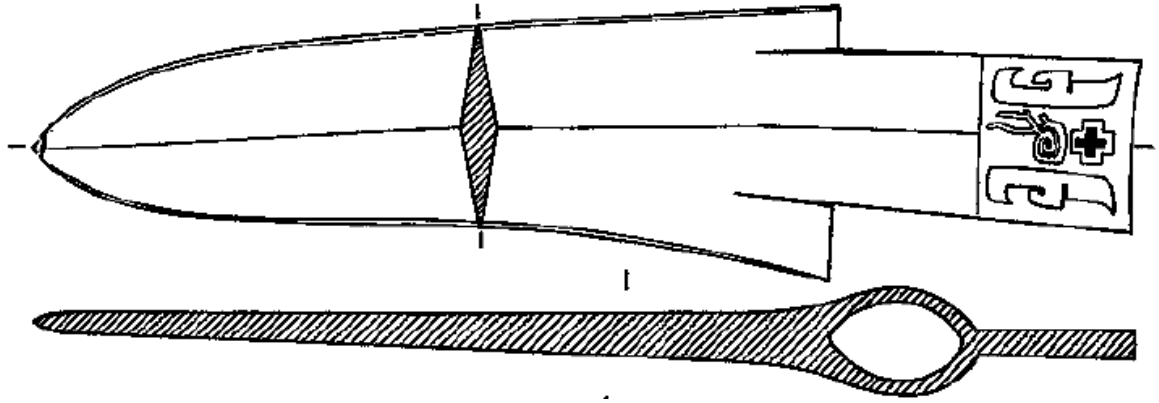


Figure 6.3 Dagger-axe type IVB from Huayuanzhuang M54 (Zhongguo shehui kexueyuan kaogu yanjiusuo 2007, Figure 116.1, 151)

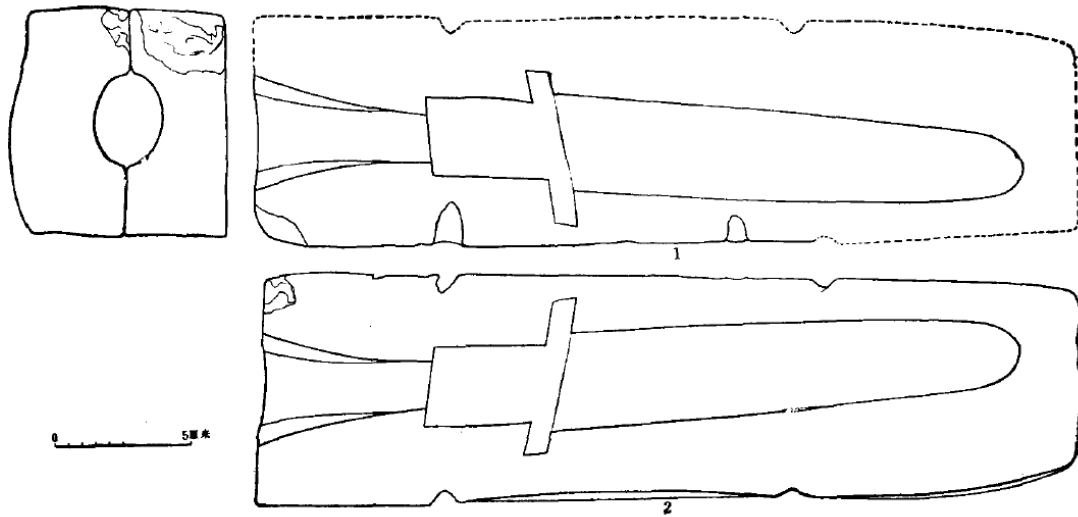


Figure 6.4 Clay dagger-axe mould (after Zhongguo shehui kexueyuan kaogu yanjiusuo 1994, Figure 139, 265)



Figure 6.5 A section of a curved-spine knife (1945,1017.189) under direct lamp light using Panasonic DMC-LX7 digital camera (author's photo)



Figure 6.6 A section of curved-spine knife (1945,1017.189) under digital microscope (author's photo)



Figure 6.7 Striations on the bevel of a hooked-head knife (1981,1117.1) (author's photo)

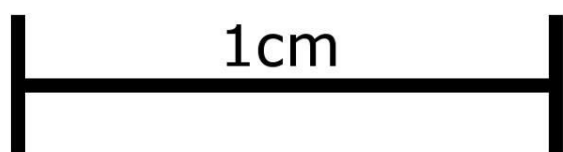
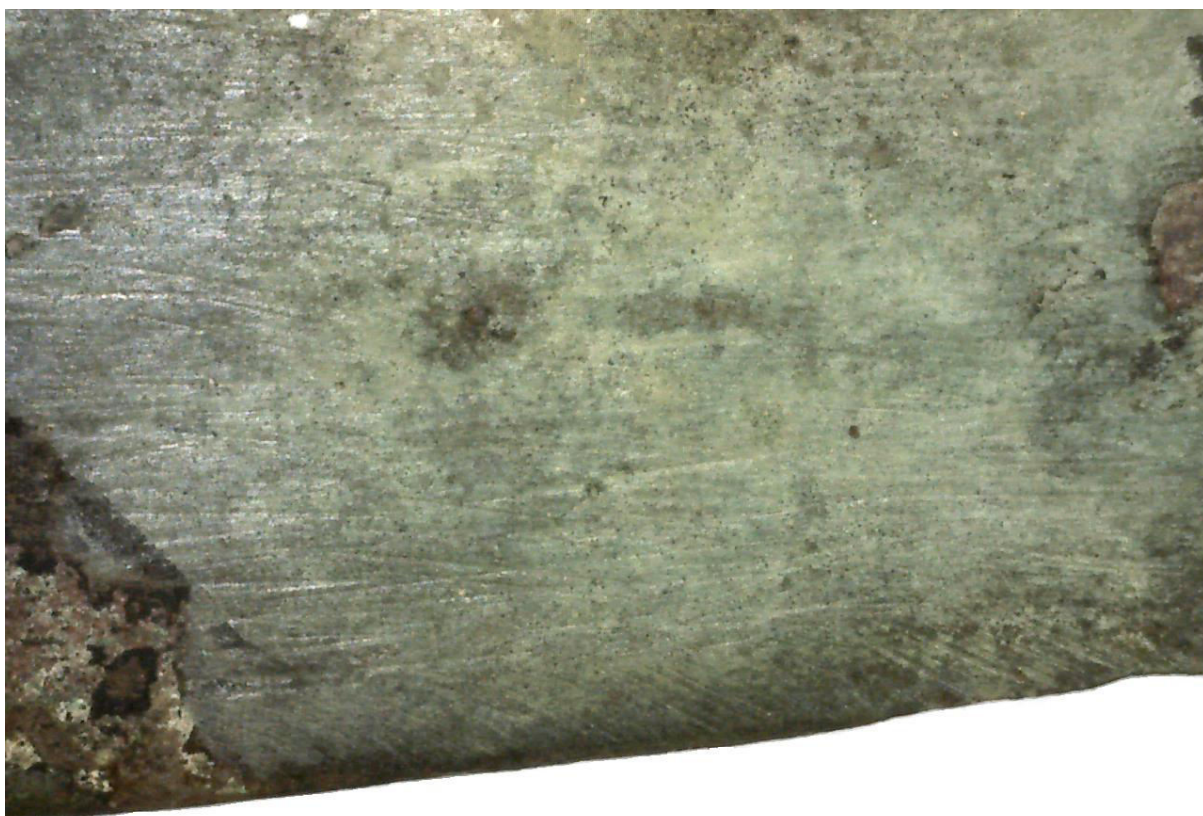


Figure 6.8 Two variants of striations on blade body and bevel (curved-spine knife 1945,1017.189) (author' photos)

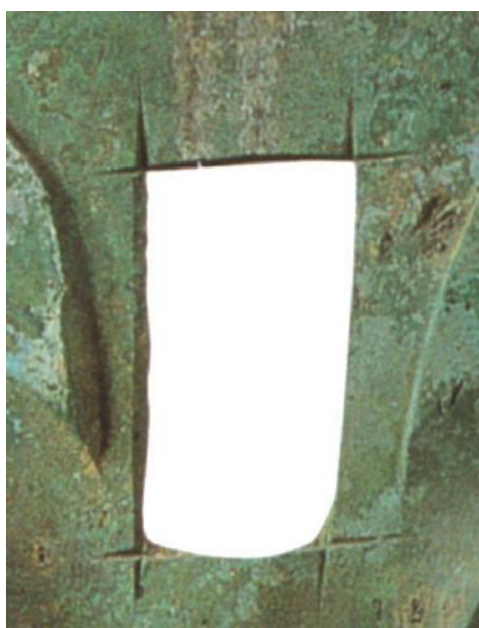


Figure 6.9 Cutting marks shown on a mask from the Sanxingdui site (Dong Yawei 2006, Figure 23, 32)

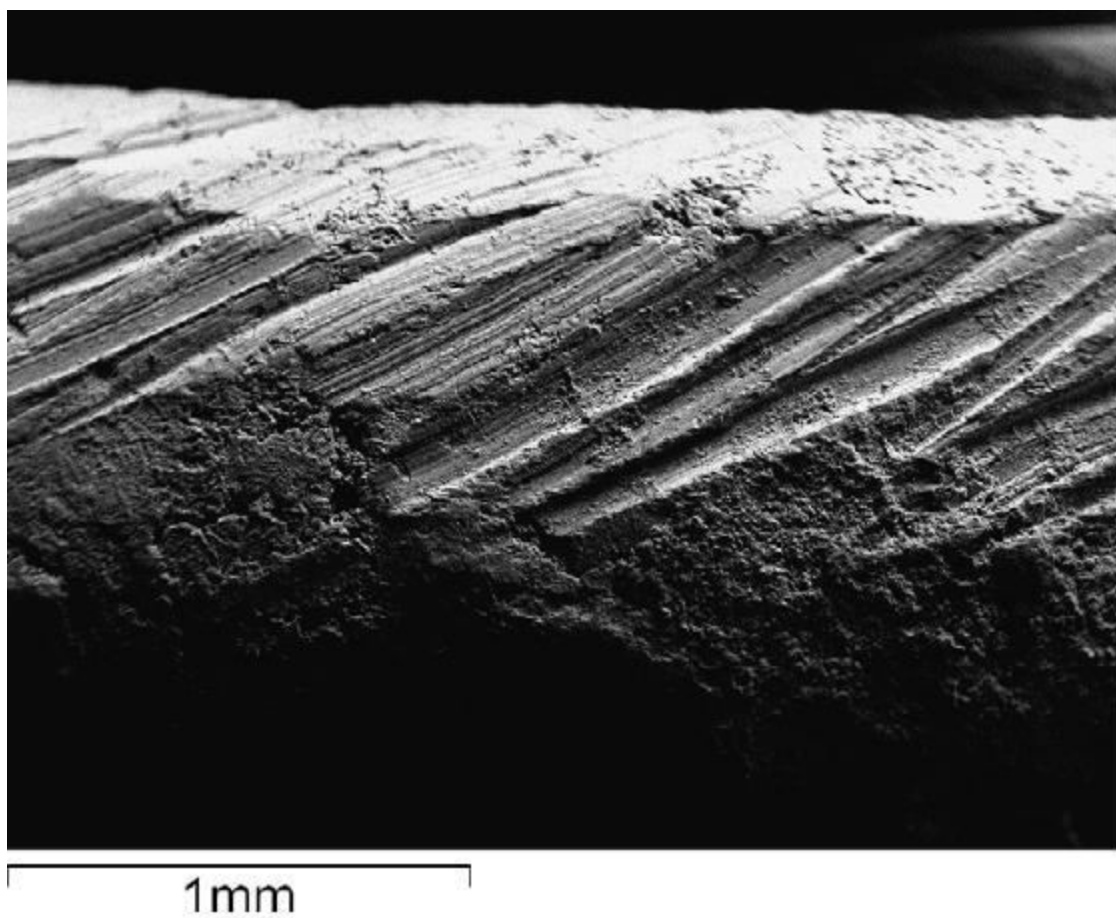


Figure 6.10 SEM micrograph of filing marks on the tang of an arrowhead (Li Xiuzhen et al. 2011, Figure 10, 498)

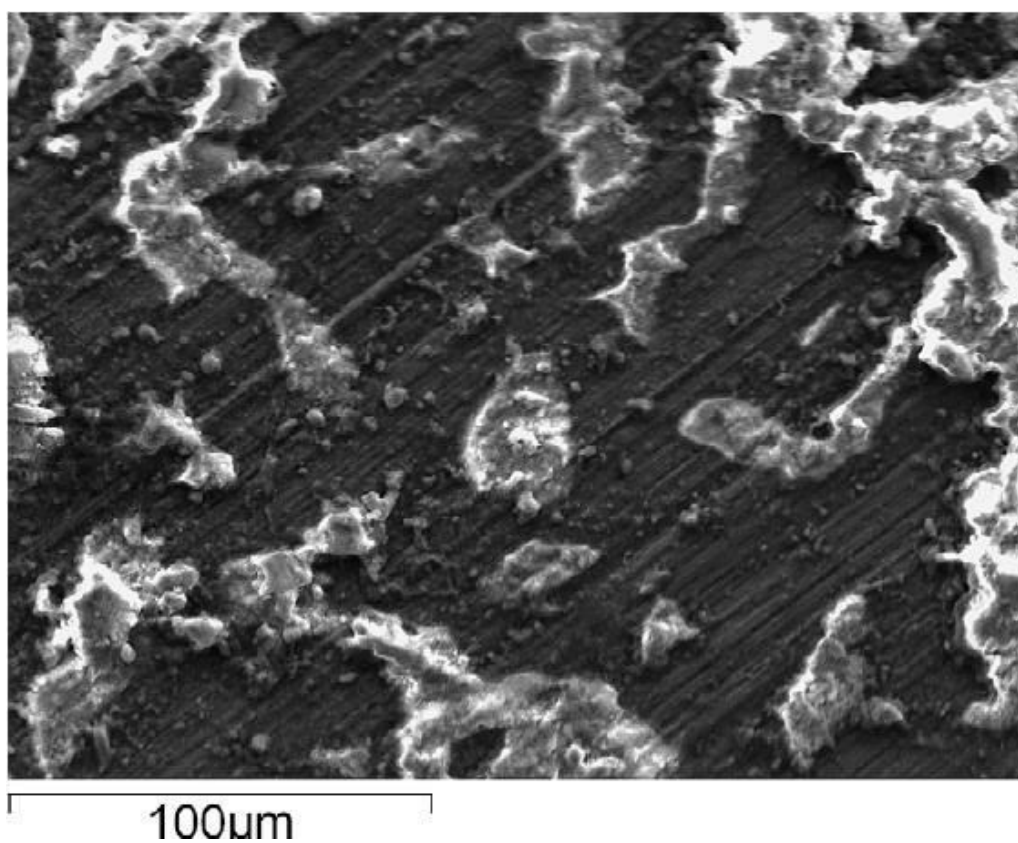


Figure 6.11 SEM micrograph of grinding marks on the surface of a sword (Li Xiuzhen et al. 2011, Figure 13, 499)



Figure 6.12 Tool marks on the bevel of dagger-axe 1933,0413.11 (author's photo)

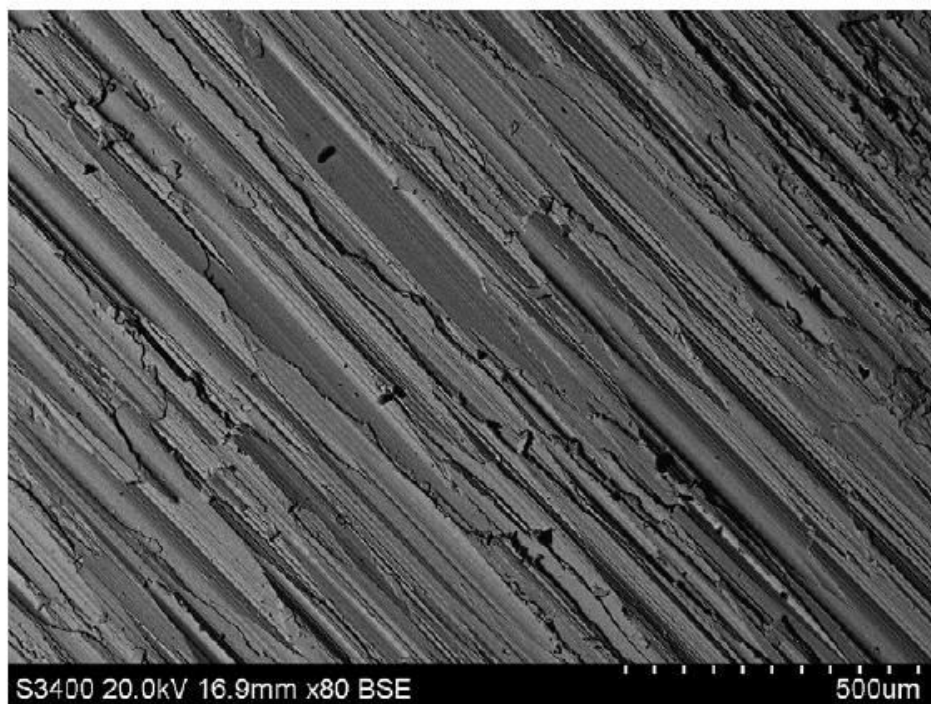


Figure 6.13 SEM micrograph of grinding marks on a brass surface using a stone rotary wheel- experimental replications (Li Xiuzhen et al. 2011, Figure 14, 499)

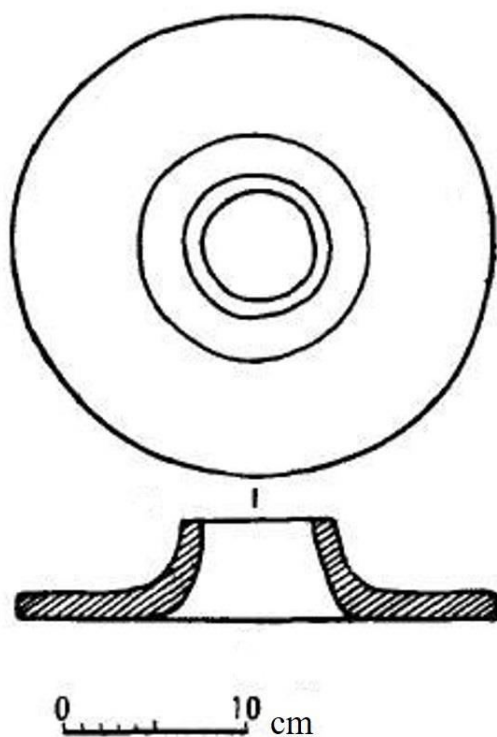


Figure 6.14 Ceramic rotary wheel (87XTH1:13) found at Anyang (Zhongguo shehui kexueyuan kaogu yanjiusuo 1994, Figure 118.2, 241)



Figure 6.15 Striation marks partially covered by corrosion products (curved-spine knife 1945,1017.189) (author' photos)

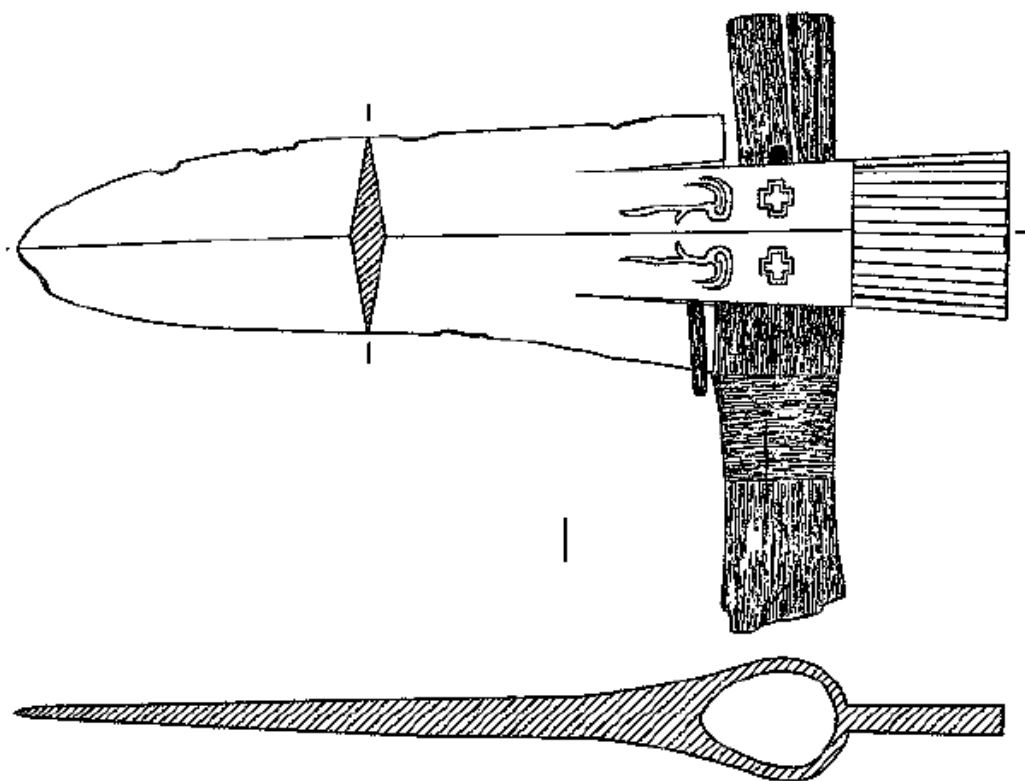


Figure 6.16 Bronze dagger-axe (M54:93), Huayuanzhuang M54, Anyang (Zhongguo shehui kexueyuan kaogu yanjiusuo Anyang gongzuodui 2007, Figure 115.1, 150)



Figure 6.17 Blunt edge of dagger-axe 1948,0716.40 (author's photo)

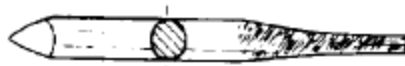


Figure 7.1 Non-barb bone arrowhead (M53:34) from Guojiazhuang M53 (Zhongguo shehui kexueyuan kaogu yanjiusuo 1998, Figure 48.9, 63)

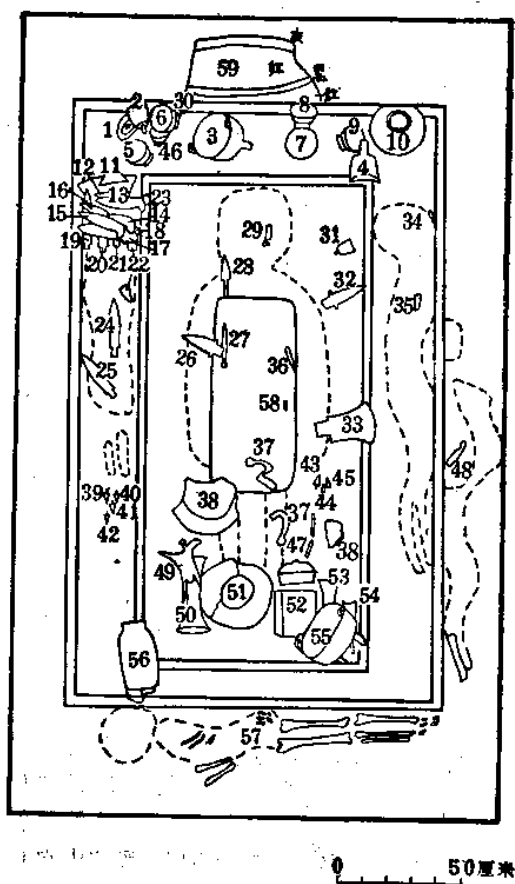


Figure 7.2 Layout of M663 (Zhongguo shehui kexueyuan kaogu yanjiusuo Anyang gongzuodui 1988, Figure 2, 866)

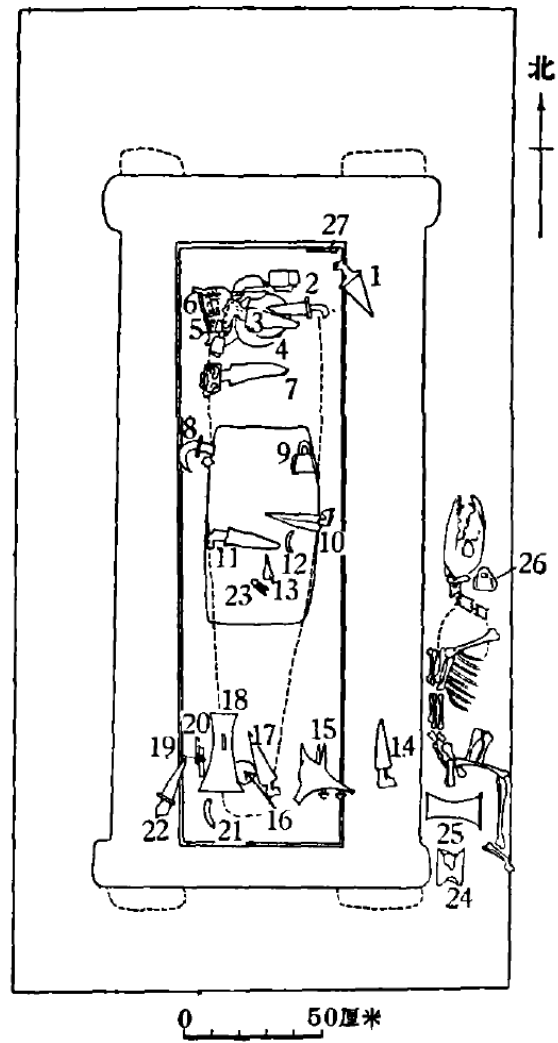


Figure 7.3 Layout of M613(Zhongguo shehui kexueyuan kaogu yanjiusuo Anyang gongzuodui 1979, Figure 38, 52)

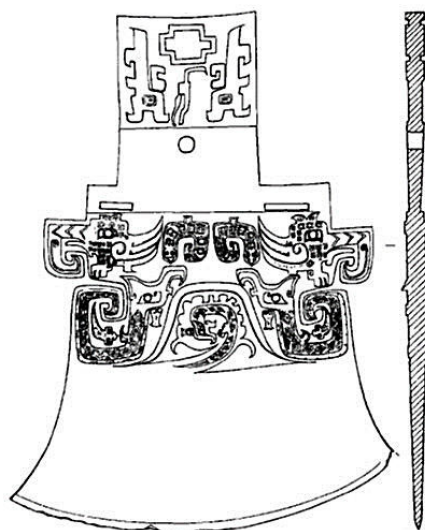


Figure 7.4 Broad flat axe (M54:86) from Huayuanzhuang M54 (Zhongguo shehui kexueyuan kaogu yanjiusuo 2007, Figure 103.2, 137)

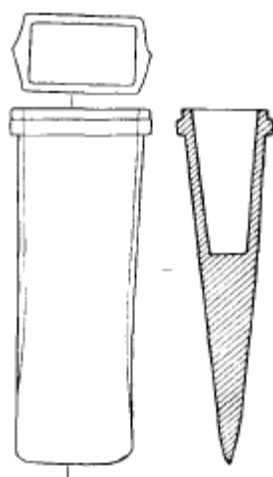


Figure 7.5 Bronze axe-tool from Guojiazhuang M160 (M160:253) (Zhongguo shehui kexueyuan kaogu yanjiusuo 1998, Figure 88.3, 112)

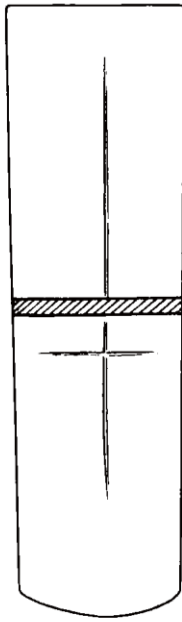


Figure 7.6 *Yue*-shaped object from Zhengzhou site (Henansheng wenwu kaogu yanjiusuo 2001, Figure 617.1, 923)

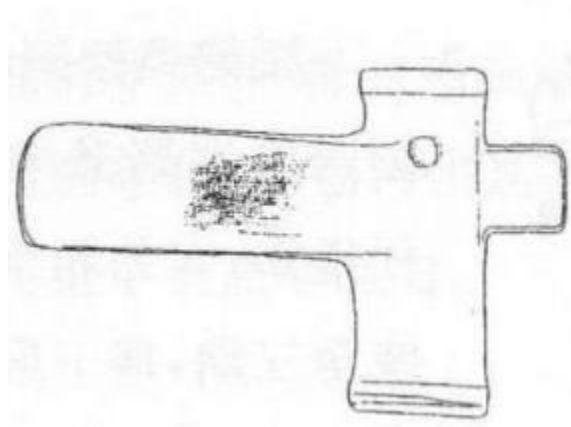


Figure 7.7 Northern style socketed axe (Zhu Fenghan 2013, Figure 4.2, 9)

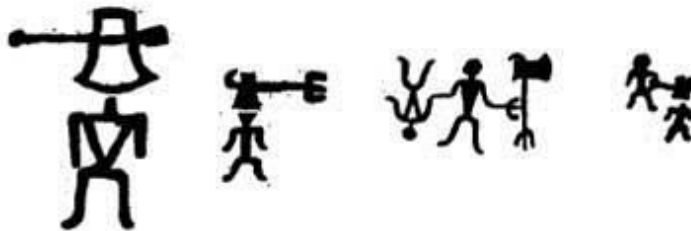


Figure 7.8 Bronze inscriptions that feature battle axes (Yang Xizhang and Yang Baicheng 1986, Figure 3, 134)



Figure 7.9 Depiction of execution using a broad flat axe on a late Shang bronze cauldron
(Zhongguo shehui kexueyuan kaogu yanjiusuo 1984-1994, 5204)



作父乙

Figure 7.10 Bronze vessel *you* with its inscription (broad flax with an ancestor name)
(Institute of History and Philology Academia Sinica 2009)

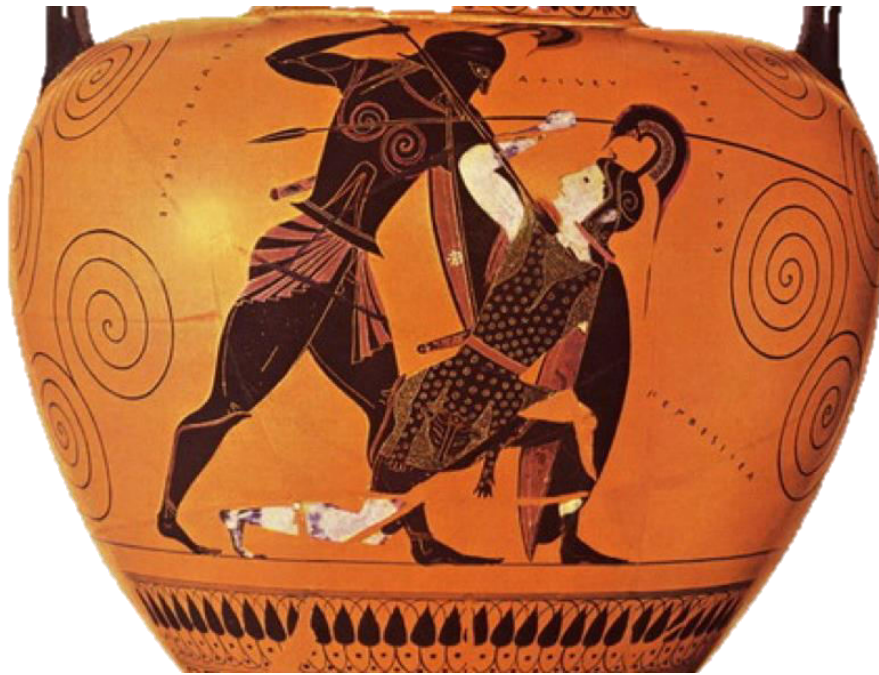


Figure 7.11 A depiction of Achilles striking down Penthesilea³

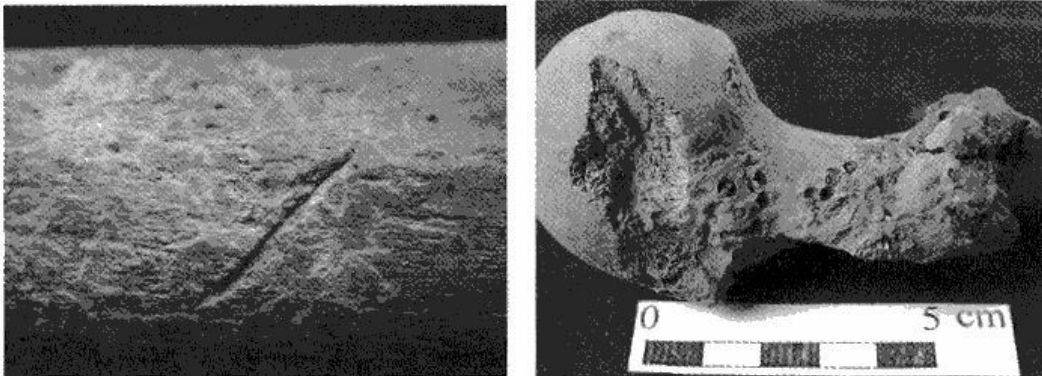


Figure 7.12 Trauma on bones of the M54 occupant (left: left humerus; right: left thighbone)
(Zhongguo shehui kexueyuan kaogu yanjiusuo 2007, Figure 1 & 2, 283)

³ Available from: <https://www.tumblr.com/search/aim:%20penthesilea> (accessed 5th December 2015)

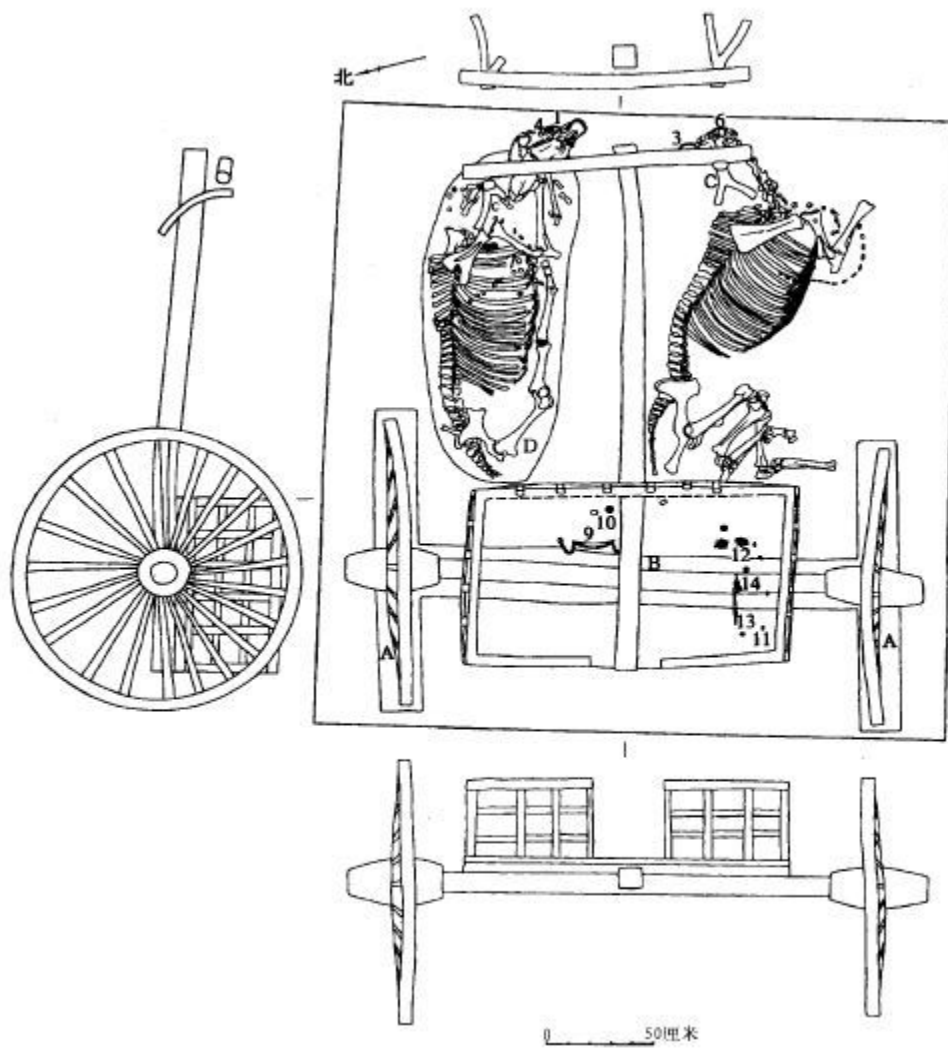


Figure 7.13 An illustration of a Shang chariot in pit M147 (Zhongguo shehui kexueyuan kaogu yanjiusuo 1998, Figure 109, 144)

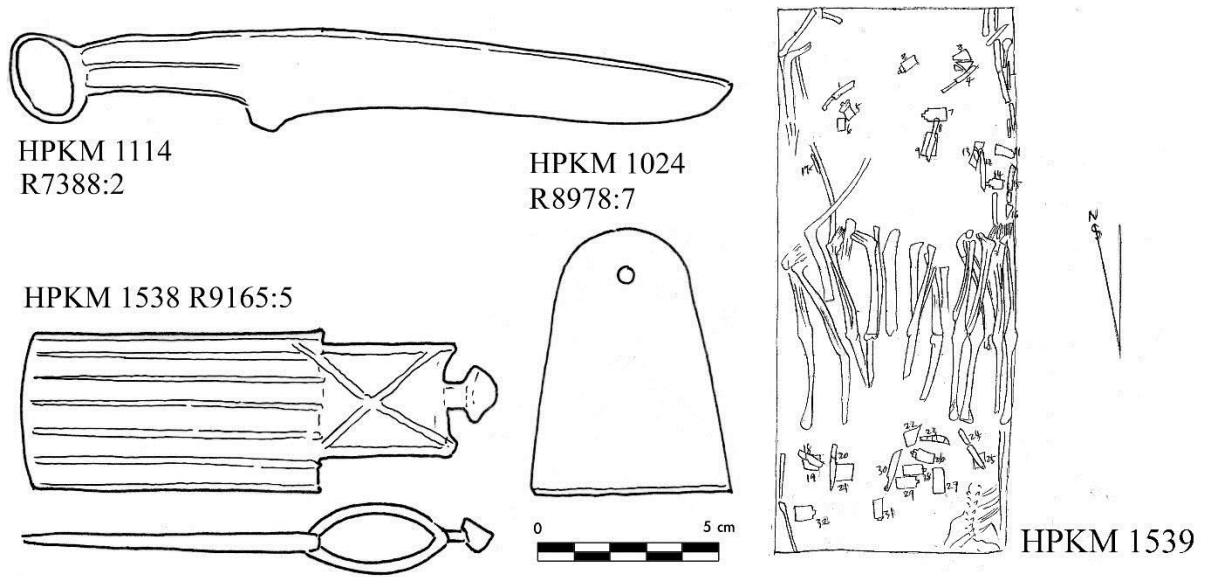


Figure 8.1 'Knife and axe burial', Xibeigang, Anyang (Hwang Ming-chorng 2015, Figure 12)

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