

Bronze Age China

Bronze Age China:
Style and Material

Edited by

Ying Wang

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Bronze Age China: Style and Material, Edited by Ying Wang

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INTRODUCTION

YING WANG

“Style” in studies of material culture normally refers to the formal character of visual elements. However, current research pertaining to the topic of “style” in the art and archaeology of ancient China is relatively complex, frequently encompassing discussions related to the function of objects under investigation and their context. This type of investigation helps to identify and define different individuals or cultural groups who create material goods with distinct styles, and to understand possible interactions among the people who use these items. It elucidates aspects of life-style, gender, social structure, labor division, and craft specialization in a society. In addition, it also helps explain the social strata, rituals, and technical traditions in a community.

In the past, stylistic studies of Chinese objects focused on their appearance, paying attention to decorative motifs, surface designs, and shape. These discussions frequently failed to address how the shape and design of the objects relate to their function, although function and usage certainly affect the formal characteristics of objects. This is best exemplified in the stylistic studies of architectural forms, whose spatial elements are dictated by the behavior of their users. It is the activities of human groups or individuals that help to establish the materials and structure of architectural elements, such as the open space surrounding a fire pot on a floor, or the seating arrangement at a dining table. The selection process for materials is dictated by or tied to these varied functions; material and function become intrinsic parts of the design。

The purpose of this introduction is not to critique existing literature. Mr. Guo Baojun 郭宝钧’s book: *商周青铜器群综合研究* or *A Comprehensive Study of the Distinct Groupings of Bronze Vessels from the Shang and Zhou Dynasties* (Beijing: 文物出版社 Wenwu Chubanshe, 1981) whose manuscript was originally written and revised between 1962-1970, cogently explains the interweaving of function and design. This work turned out to be a vanguard in the study of the distribution patterns of artifacts in

mortuary practices. Unfortunately, it was published long before “New Archaeology” became widespread and therefore failed to become academically influential. Although it shows excellent scholarship, it was only recognized for being unique.

On the other hand, good scholarly vision and proper timing eventually led to the acknowledgement that function, use, and materials were central to the stylistic study of Chinese art and archaeology. Recent scholarly exchanges between China and foreign institutions have helped establish training grounds for a new generation of archaeologists and art historians who regard the inclusion of stylistic issues as a prerequisite for their scholarly pursuits. Since studies of “style” in Chinese art and archaeology encompass complex meanings, the articles in this book seek different avenues through which to explore the styles of various objects. They are written by scholars who have pursued different disciplines and have studied ancient cultures and societies from his or her individual perspective.

This volume is divided into three sections. The first section, titled “Style Reconsidered,” includes two articles: “Functional Style of Ceramics from Miaopu Locus North, Anyang, and Changes in Social Relations,” by Minna Franck, and “Stone Tools and Style in Chinese Archaeology: Zhongba Lithic Artifacts and Cultural Interaction in the Yangzi River Valley,” by Gwen P. Bennett. Both writers are field archeologists using methods that have not been previously applied to Chinese archaeology.

Frank employs technological analysis in her study of the domestic pursuits at the Miaopu site of Anyang in Henan. Through an examination of the surface features of cooking and serving utensils from the site, she examines a society in which varied social classes engaged in different food-related activities. Her discussion concludes with a link between the typology and function of objects in a social context. Similarly, Bennett analyzes the context and usage of stone objects to explain the function of these items, using raw material selection, manufacturing process, context, and the provenance of objects as key elements for discussion. By examining the actual usage and symbolic meanings of stone tools, she suggests that interactions between cultural groups constitute a primary factor in the development of the class structure of centralized state societies. Both works stress the fact that manufacturing processes and technological aspects are relevant to the appearance of archaeological finds.

The second section, titled “Cultural Interactions and Media,” includes “Style and Social Boundary in Bronze Age Southeast China,” by Tianlong Jiao, and “Interpreting the Stylistic Variation of Early Drums from Yunnan,” by Tzehuey Chiou-Peng. Jiao discusses the “assemblage” of the formal aspects of a “style,” and uses it as one of the criteria to delineate cultural boundaries. Consistent with the methodology used for the articles in Section I, the author states that the manufacture, usage, and cultural context of artifacts must be examined alongside the typological classifications of traditional Chinese archaeology. He suggests that such a stylistic approach is particularly effective for studying cultural identity in a spatial sense. In the second article, Chiou-Peng incorporates metallurgical analyses of alloy materials and techniques into her discussion of the stylistic variations of Yunnan drums, as well as exploring the social contexts in which different types of drums were being used or adapted. She argues that current theories regarding the origin and possible linear evolution of the metal drums in southwest China and adjacent regions are in need of re-evaluation, because they are formulated primarily on the basis of visual examination of the stylistic features of artifacts.

The third section, titled “Power and Belief,” comprises topics of great interest to young scholars today. “The Fu of the Shang Dynasty: Women, Wives and Warriors,” by Mara A. Duckens¹, and “Style and Belief: A Study of the Discoveries of Sanxingdui,” by Shi Jinsong. Duckens examines the case of Fu Hao in a broad context. She identifies the unique position of a female warrior and political leader, and critiques current approaches used in gender studies, which has become fashionable during the past two decades in various humanistic disciplines. In her work, archaeological materials and theories are used to reinterpret Fu Hao’s social, political, domestic, and military roles, and to investigate how the Queen lived in relation to other Shang women. Jinsong Shi, the author of the second article in this section, uses his experience with historical data to review current scholarship on Sanxingdui artifacts from Sichuan. He offers a general view of the disputes in current studies of the site and its artifacts, and critiques existing interpretations of the Sichuan materials through an examination of the location and state of the discovery of these artifacts, in addition to exploring possible ritualistic implications of the final destination of these items in their archaeological context.

These studies make it abundantly clear that new terms are needed to underscore the importance of function, behavior, manufacture, usage, design, and material in the making of a “style.” The authors do not view

the stylistic aspects of objects as isolated entities, but instead examine the elements encompassed in “styles” in conjunction with the cultural context of the items.

In the endnotes, the names of the Chinese authors of Chinese language articles are placed according to Chinese custom, listing their family names first; Chinese authors of English publications are placed in the Western way, with their given names listed first.

This volume is the result of a conference panel of the Midwest Art History Society that included Mara Duckens’ paper and the works of three graduate students from the University of Wisconsin-Milwaukee (2004). I thank these authors, whose work serves as an inspiration for this book. I must also thank the students from the Department of Art History at the University of Wisconsin-Milwaukee, who participated in a colloquium on Bronze Age Art and Cultures of China in 2009. Their knowledge and interest in the subject of “style” encouraged me to pursue the compilation of this volume. My special thanks also extend to Emily Gaustad, Aisha Motlani, Bhuvan Narayan, Suzan Brookshire, Tzehuey Chiou-Peng, and Kenneth Bendiner for their assistance in preparing this manuscript. Special thanks to the cover designer, Xiaowei Zhou, senior designer and multiple national award winner of the Wenwu Cultural Relics Press of China.

Notes

¹ The Wade Gile system for romanization is used for the Chinese names and citations in this paper due to the author’s training, while all other authors use *pinyin*.

PART I.

STYLE RECONSIDERED

FUNCTIONAL STYLE OF CERAMICS FROM MIAOPU LOCUS NORTH, ANYANG, AND CHANGES IN SOCIAL RELATIONS

MINNA FRANCK

Stylistic analysis of excavated material forms the very core of archaeological practice. Artifact typologies, used in dating archaeological sites and associating them with a specific culture or cultural phase, are based on stylistic analysis. Archaeologists ground their interpretations of time and space connections between human groups and cultures on stylistic comparisons of artifacts and artifact assemblages. The amount of stylistic variation between two artifact types or two assemblages is used as the measure of the closeness of the two in time or space.

In Chinese archaeology, the spatio-temporal placement of objects has been and still remains the most important use of stylistic analysis of archaeological artifacts, especially for ceramics which are used for dating sites and assign cultural affiliation. This can be discerned from the standard format of Chinese archaeological reports. They open with a description of the excavation and the excavated site, offer an example of the stratigraphy, and then focus on the description of excavated features and artifacts. A few examples are described for each feature and artifact type. The latter are organized based on material, shape, and sometimes also function. Each individual artifact shape is further divided into types and subtypes arranged chronologically. The division into types and subtypes is based on stylistic differences between artifacts as discerned by the typologist. Despite verbal artifact descriptions and illustrations, it is often difficult to understand the reasons behind type and subtype assignments since the descriptions do not explicitly state which feature(s) of the artifact warrant its assignment into a type. At the end of the reports, these types are compared with types from surrounding sites and are used to assign the excavated site into a time period and a specific culture. Despite the subjectivity of these artifact typologies, the chronologies which are based on them are usually very trustworthy. Thus the typologies and the stylistic analyses they are based on do what they are supposed to do.¹

In Western archaeology, however, stylistic analysis is no longer confined to the assignment of date and cultural affiliation. Style and its analysis also open a window into the social and ideological realms of human groups under investigation.² Despite such an importance, style as a concept does not have a single definition upon which all archaeologists agree. Traditionally style was something that was residual, something that remained after function had been accounted for.³ Since the late 1970s, more varied definitions of style have appeared in archaeological literature.⁴ For my discussion here, definitions such as “passive style” by Sackett, and “technological style” by Lechtman, Childs and Stark are the most appropriate.⁵ For Sackett passive style is inherent in the functionally equivalent (isochrestic) but culturally determined choices that are included in the object’s manufacture.⁶ Passive style does not carry any intentional messages of the manufacturer. This, however, does not prevent the user or the observer from reading messages into the object. Childs defines technological style as the formal expression of the behavioral choices that were made during the object’s manufacture and use.⁷ This formal expression has the capacity of expressing social information. Technical style represents the sum of the technical process from material procurement to the use of the artifact.⁸ For my use of the term here, the inclusion of artifact use into the definition is crucial as I will show later on.

Dobres brings another interesting dimension to the discussion on technological style although she strictly speaking did not discuss technology in terms of style. Her understanding of the term technology can nevertheless be easily extended also to include the style of the end product of technology. In discussing technology, she emphasizes the *process* of making things and focuses on the engagement of craftspeople with their material and social world.⁹ Her discussions on technology particularly focus on technologies as socially constituted practices. These practices do not only produce material products but also personal, practical, and cultural knowledge. Technological practices also reproduce taken-for-granted social values and cultural understandings of the world. She especially points out that technologies reaffirm cultural values about the right and wrong ways of doing things, who is allowed to do what and who is given access to materials and correct practices. She considers these to be “communal values” expressed in technology.¹⁰ This comes very close to Child’s interpretation of technological style and what technological style entails and expresses.

Technological style of an artifact is thus a combination of culturally and environmentally determined choices made by the manufacturer and user of the object that are visible in the object. The object thus carries in it information concerning these choices. Although Stark in her own study uses the concept of technological style in way style has traditionally been used – to look for social boundaries – her discussion concerning stability and change in technological styles provides interesting possibilities for going beyond this traditional usage. Stark explains that technological style is often more resistant to change than decorative aspects of material culture because a change in technological style requires a change in the actual manufacturing process.¹¹ She enumerates several factors that may affect the forms of variation expressed in technological style. These include changes in subsistence practices, changing patterns of social interaction and social integration as well as changes in community structure. Ceramics and changes in their technological style are especially pertinent for investigating these social processes, because such changes are important indicators of not only social boundaries but of the social contexts of food preparation and serving.¹² Food preparation and consumption activities – foodways – of a culture, in turn, are directly connected to the overall social, political, economic, and ideological structures of that culture.¹³

A classic study using ceramics to study foodways and thereby a community's social practices is Blitz's 1993 study *Big Pots for Big shots: Feasting and storage in a Mississippian community*. In this study, Blitz compares ceramic assemblages from mound and village contexts at the prehistoric Lubbock Creek site in Alabama in order to discover whether mounds were the locations of feasting. Feasts were an important setting for social integration and status competition in small-scale societies.¹⁴ His premise was that if the mound was the location of feasting then the mound and village pottery assemblages might vary in a way reflecting this difference. What he found was that there were no significant differences in the distribution of vessel shapes or in the ratio of serving to cooking wares. However, his mound sample had a more restricted range of vessels sizes and significantly larger vessels than the village sample. The wider range of vessels in the village samples reflected the variety of domestic activities, while the narrower range in the mound reflected large-group food consumption and storage. By combining the ceramic information with information from the analysis of other artifact classes, Blitz concluded that the mound clearly was a location of a distinct social context of food consumption.

As with Blitz, in most cases ceramics are no longer the only find category used to study foodways in archaeological contexts. Paleoethnobotany and zooarchaeology have added significantly to our knowledge of food-related practices in prehistory. In China, however, both methods are still used relatively seldom and published reports are not conducive for the type of analysis Blitz presented in his article. By gaining access to and analyzing foodways through already excavated material from Chinese sites can, however, expand out knowledge of social practices in early China. In this chapter I will show how such an expansion is possible by utilizing the concept of technological style. I examine the development of the technological style of three ceramic forms during the Late Shang 商 dynasty (ca. 1300-1045 BCE) and will relate this development to changes in food preparation and serving, and ultimately to larger social factors I think influenced this development. I will focus on *li* tripods (鬲), *pen* basins (盆), and *gui* pedestaled bowls (簋) from the site of Miaopu Locus North 苗圃北地 from the Late Shang dynasty capital of Yinxu 殷墟. I chose Miaopu as the focus of my investigation because it was a large bronze manufacturing site. The central importance of bronze objects for Shang elite culture is well-known. This importance placed Miaopu and its occupants at the center of Late Shang life, which makes this site particularly interesting when studying Shang social processes. This presentation here is based on my 2005 dissertation.¹⁵

Study Period and Area

The Shang period (ca. 1600-1045 BCE) is divided into the Early, Middle, and Late Shang periods. It is named after a political entity that ruled the middle Yellow river region of China at that time. The Shang culture connected to that political entity is defined by common cultural features such as burial practices, manufacturing of bronze ritual vessels and the use of those vessels in ancestor worship rituals, as well as by the use of oracle bone divination. This culture is mainly known through a series of large archaeological sites such as the site of Erligang 二里崗 (in modern Zhengzhou 郑州 in Henan 河南 Province) of Early Shang.

At the moment, the Late Shang state is mostly known through archaeological excavations at Yinxu and through the study of oracle bone inscriptions. The use of oracle bone inscriptions is known also from the earlier periods, but in contrast with those, the kings of the Late Shang period had these bones inscribed with the charges tested, and frequently

also with prognostications and verifications related to the charges. This makes it the earliest extensive written source on Chinese history.

The Late Shang archaeological culture of Yinxu is divided into four ceramic phases, Yinxu Periods I-IV, and into five oracle bone phases, which roughly correspond to the reigns of Shang kings and to calendrical dates as shown in Table 1. In the following, I will use the ceramic phases, which I have further consolidated into two larger phases Early (Yinxu Periods I-II) and Late (Yinxu Periods III-IV) because I do not have enough pottery vessels for each phase of the four original ceramic phases to do a meaningful analysis.

Yinxu is located to the east of the Taihang 太行山 mountains on two terraces of the Huan 洹 River in the Anyang basin, which is situated at the western edge of the North China plain (see Figure I-1 and Figure I-2).¹⁶ The basin is approximately 20 km long north-south and 10 km wide east-west. The western end, where the basin joins the Taihang mountain range, is higher in elevation than the eastern end. The eastern end is on the same elevation with the North China Plain. The Huan River enters the basin from southwest and flows towards north. It then turns and flows east. Yinxu is situated to the northwest of the modern day city of Anyang 安阳 on both banks of the Huan River. Within its over 30 km² area Yinxu includes a royal palace and temple area located approximately at the center on the south side of the Huan River, a royal cemetery area on the north bank of the river, and several residential, manufacturing, and cemetery sites (See Figure I-3).

Table 1. Late Shang Periodization¹⁷

Yinxu Ceramic Periods ¹⁸	Oracle-bone phases ¹⁹	Kings	Rough Reign Dates BCE ²⁰	Rough Reign Dates BCE ²¹	Rounded C14 Dates BCE ²²	C14 dates BP ²³
Yinxu IV	Oracle-bone period V	Di Yi, Di Xin	1105-1045	1101-1046	1087-1036	2942±35, 2912±31, 2900±35, 2892±33, 2932±34
Yinxu III	Oracle-bone period IV	Wu Yi, Wen Wu Ding	1157-1106	1192-1102	1205-1080	2937±33, 2962±35, 2960±37, 2888±35, 2856±35, 2956±35, 2935±35, 2946±35, 2882±37, 2983±34, 2954±37, 2951±35, 2870±35
	Oracle-bone period III	Lin Xin, Kang Ding				
Yinxu II	Oracle-bone period II	Zu Geng, Zu Jia, Late Wu Ding	1188-1158	-1192	1255-1195	2964±33, 2994±37, 2908±32
	Oracle-bone period I	Early Wu Ding	-1189 BCE			
Yinxu I	Oracle-bone period I	Early Wu Ding	1240- (Keightley 1978, table 14 p.203)	1250-	1370-1239	3030±35, 3039±42, 2920±35
		Xiao Xin, Xiao Yi		1300-1251		

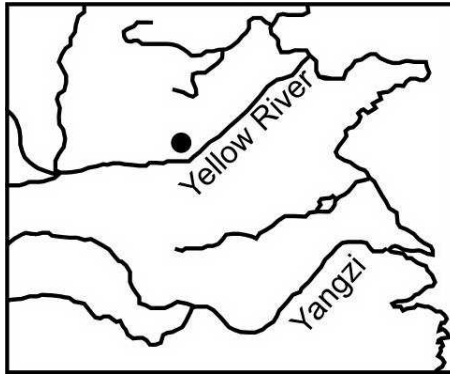


Figure I-1. Location of YinXu in the Yellow River valley

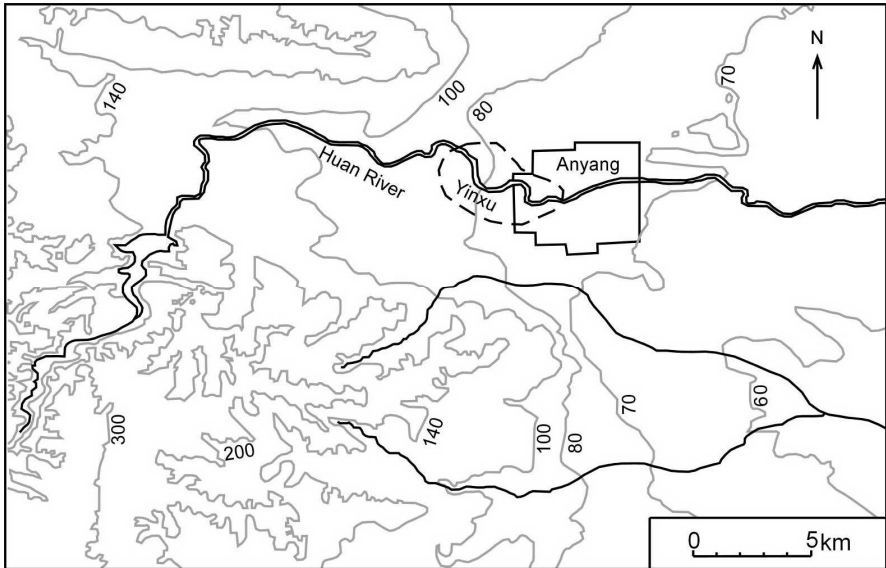


Figure I-2. Location of YinXu in the Huan River basin

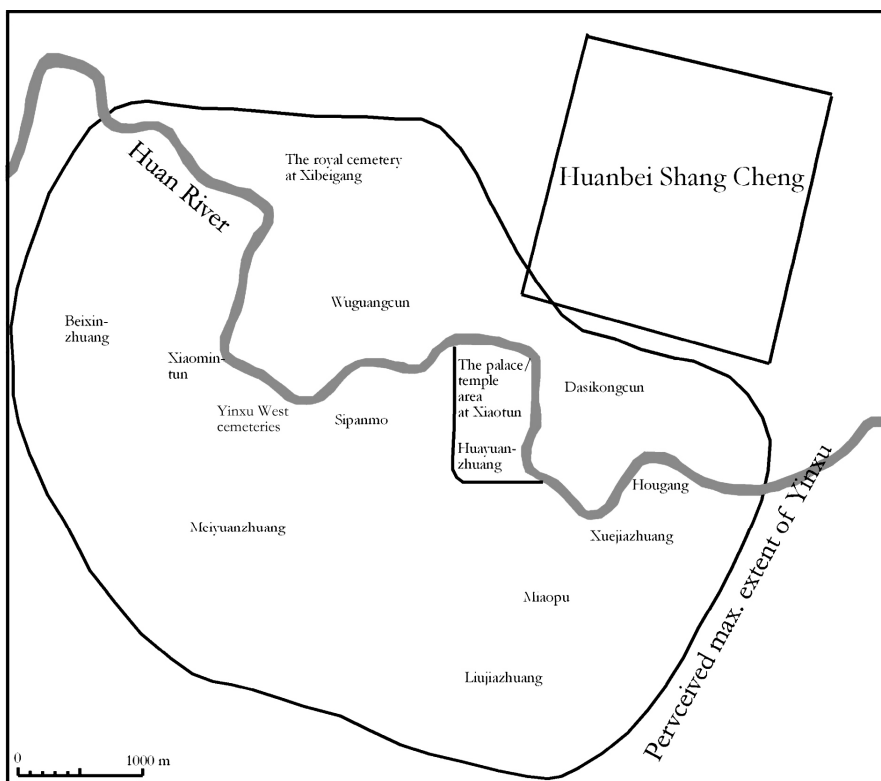


Figure I-3. Selected sites within Yinxu.

During Yinxu Period I, occupation at Yinxu concentrated at the palace and temple area, at its immediate vicinity in the west and south, Miaopu Locus North, Hougang 后岗, Dasikongcun 大司空村, Wuguangcun 武官村, and Sipanmo 四盘磨 (Figure I-3). Remains from this period consist of cultural layers, ashpits as well as house foundations. Bronze manufacturing remains have been found at Miaopu and at the palace/temple area, and traces of a pottery manufacturing area have been located near Miaopu. The largest tombs dated to this period were located at Wuguangcun. The aerial extent of Yinxu at this stage was ca. 12 km².

A ditch was dug around the western and southern edges of the palace/temple area during Yinxu Period II. Together with the Huan River this ditch separates the palace/temple area from other Yinxu sites.

Manufacturing locations dated to this period are the bronze manufacturing site of Xuejiazhuang 薛家庄 (possibly connected to Miaopu), Miaopu itself, a bronze foundry site located to the southwest and southeast of Xiaomintun, and a bone manufacturing site to the southeast of Dasikongcun. During Yinxu Period II, residential area increased dramatically and now extended in the south to Liujiazhuang 刘家庄 and Meiyuanzhuang 梅园庄, and in the west to Xiaomintun (Figure I-3). The royal burial ground at Xibeigang 西北冈 as well as cemeteries at Yinxu West 殷墟西地 located south and southeast of Xiaomintun begun to be used at this time.

During Yinxu Periods III and IV, both the royal cemetery and the palace/temple area remained in use. During this time handicraft activities at Yinxu increased and continued not only in the previously mentioned locations but also at an additional bone manufacturing area at Beixinzhuang 北辛庄 and at a jade manufacturing area to the northwest of Xiaotun (within the area demarcated by the ditch). In many cases, previously occupied settlements increased in size and spread, and the area of occupation increased to the 30 km² currently held to be the limit of Yinxu (Figure I-3).

Miaopu Locus North – a Multicomponent Bronze-manufacturing Site

The focus of my analysis here, Miaopu Locus North, is located in the southeastern part of the Yinxu protection area, ca. 1 km southeast of Xiaotun (Figure I-3). The site consists of a Western and Eastern Zone (*bu* 部).²⁴ The Western Zone comprises of an eastern section and a western section (*qu* 区) separated by 25 m. The former is a foundry area while the latter is a dwelling area that has not yet been published.²⁵ This zone was excavated between 1959 and 1964.²⁶ The excavations at the eastern section of the Western Zone located plenty of bronze-production-related materials, rectangular pit burials, urn burials as well as structures.²⁷ The Eastern Zone has been excavated on several separate occasions in 1972-1974,²⁸ 1980, 1982, 1984, and 1987. These excavations have uncovered burials, trash pits, two kilns, and a well. Foundry remains are rare, although they have been encountered.²⁹

While the first signs of occupation at Miaopu started during Yinxu Period I, both the occupation and the manufacturing activities intensified during

Yinxu Period II.³⁰ Feature and artifact finds dated to this period include structures related to bronze manufacturing, a kiln, burials, ashpits (*huikeng* 灰坑), oracle bones, agricultural tools etc. The structural remains recovered included walled structures, structures without walls, working surfaces, and furnaces.³¹ All the above structures were different in size, layout, and orientation. Li interprets this to mean that different workshop functions were performed in close proximity to one another and that a wide range of tasks was conducted in a confined area.³² In my opinion, some of the structures could have been domestic in function.³³ An example of this is the Yinxu Period II House Foundation F4 located in excavation Trenches T204, T205, T209, and T209 at the center of the excavated area (Figure I-4).³⁴ This structure was rectangular in shape. It had only a single room that was 9 m long east-west and 3.1 m wide north-south. The door of the structure seems to have been located in the middle of the southern wall as indicated by a gap in the wall and a floor or walking surface extending out from the building at this location. Two post holes and two support stones for posts found inside the structure indicate that it was roofed. No indication of dividing walls was found. Three stoves/hearths (*zao* 灶) organized in an east-west line were located near the northeastern corner of the building. The eastern-most of the stoves was associated with a pottery jar. A contemporaneous ashpit that was an integral part of the structure was found at the center of the house. The excavators thought this was a storage pit. It contained two oracle bone pieces, two grinding stones, sixteen animal bone fragments, and pottery sherds. Unfortunately the report does not specify what vessel forms were included. The enumerated remains, however, point toward domestic, ritual, and bronze-manufacturing activities. Also the clam sickle, the bone shovel, and the sherds from a *li* and a *dou* vessel found in this structure point to activities not related to bronze manufacturing. They suggest rather food production, preparation, and serving activities. The excavators discovered only one floor layer inside the structure suggesting a rather short occupation period. Surrounding this structure were four contemporaneous urn burials of children and three adult burials. Two of these adult burials were simple rectangular pit burials with only 1-2 grave goods. One was a more elaborate tomb with a second level ledge and a waist pit. The excavators did not discover grave goods in this tomb probably due to post-depositional factors.³⁵ The occupants of two of the burials were male. The sex of the third burial could not be determined. Rather than being a workshop, this building seems to relate more to domestic activities. This may also be true for a couple of the other above-ground structures located close by. Although this does not invalidate Li's general conclusions about

the organization of production during this time (since other structures present clearly relate to bronze-manufacturing activities), it highlights the often overlooked domestic aspects of the site.

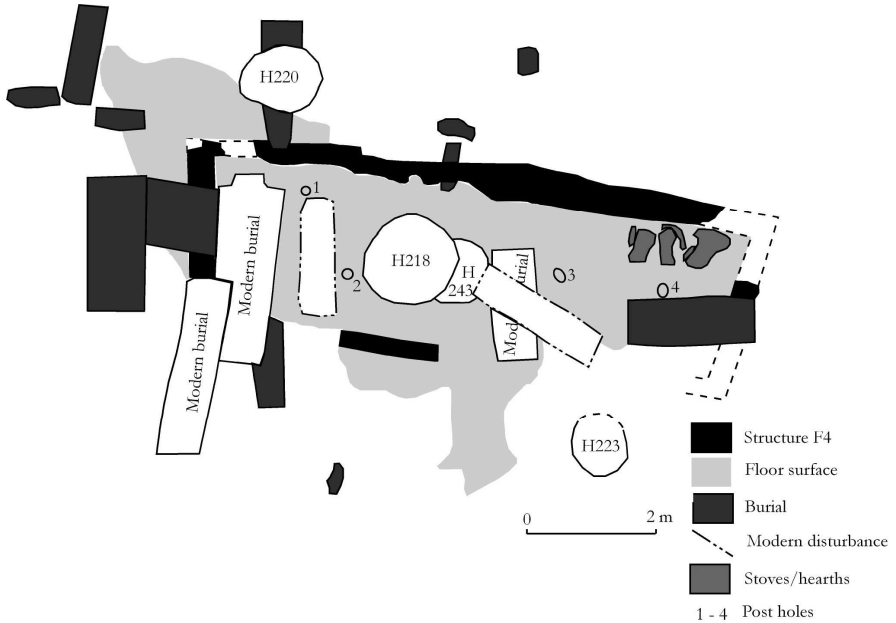


Figure I-4. Structure F4 at the bronze-manufacturing area of Miaopu

The burial and artifactual evidence suggests that men, women, and children were present at the site during the Early Phase. Evidence for the presence of children is provided by a number of urn burials which were scattered among the bronze-manufacturing remains. Shang urn burials are children's graves and they were usually placed at or near dwellings.³⁶ In most cases they are placed below the contemporaneous ground surfaces but sometimes they are also found in house floor and in between *hangtu* layers.³⁷ At Miaopu, most of the datable urn burials date to Yinxu Period II. They were concentrated at the center of the site in close proximity to structures. Some of the burials date to either Yinxu Period I or III, but no urn burials were datable to Yinxu Period IV.³⁸ In the 1987 report none of the graves were sexed, hence we do not have direct evidence for the presence of women. I would suggest, however, that the domestic features

and artifacts as well as the presence of children's burials imply that also women were present.

During Period III, the site expanded and the activities performed at the site included also bone working.³⁹ According to Li's analysis, the ash pits and workshop-related features expanded north and south during Period IV, but the urn burials disappear and only a few rectangular burials date to this period.⁴⁰ The above-ground structures at the center of the excavated area also disappeared. The excavated Late Phase walled structures are located in the southern part of the excavated area. At this time, also the link between the western section of the Western Zone and the bronze-manufacturing area seems to have ceased to exist.⁴¹ It seems then that fewer women and children were present during the Late Phase (Periods III-IV) as the disappearance of urn burials and domestic structures attests. Li suggests that the dispersal of walled structures of similar sizes and layouts, and thus perhaps similar functions, suggests that less diversified and more specialized foundry activities took place in the Late Phase.⁴²

Miaopu is justly famous in Shang archaeology for being an important bronze manufacturing site. As my dissertation shows, however, bronze manufacturing was only one of the activities that took place at the site. I argued that bone artifact, textile, and possibly also pottery manufacturing clearly took place at Miaopu as did agriculture. Agricultural tools included hoes, sickles, and reaping knives with the two latter harvesting tools forming the majority of agricultural tools found in the 1959-1961 excavations.⁴³ Bone artifact manufacturing is attested by the presence of unfinished bone tools including arrowheads, awls, and needles.⁴⁴ Other tools found in the 1959-1961 excavations at the bronze-manufacturing area of the site include textile production tools such as spindle whorls, potential ceramic production tools (paddles),⁴⁵ hunting tools (arrowheads), and spoons or ladles.⁴⁶ Spindle whorls, net weights, arrowheads, and needles were also discovered in the Eastern Zone.⁴⁷

It remains, however, impossible to say who actually was involved in all of these activities or whether some sort of division of labor was practiced. Although it is not immediately evident from the published material, I suggested in my dissertation that the burials, dwellings, and ash pits not located directly at the bronze-manufacturing site are the remains of the same individuals who were in some capacity or another involved in the production of bronzes. The similarity of the archeological remains found in individual excavation areas support this proposition. While it has never

been explicitly stated, Miaopu's usual classification as a bronze-production site has implied that only men were present at the site. I argued, however, that its residential component, domestic activities (cooking and perhaps horticulture and tending to domestic animals), presence of children's graves, and textile production⁴⁸, all suggest that women and children were an integral part of Miaopu Locus North especially during the Early Phase but less so toward the end of the site's occupation.

In his dissertation, Li studied bronze production at the Late Shang Dynasty Anyang, including Miaopu.⁴⁹ He concluded that the difference in the layout of the foundry features that occurred between the Early and Late Phases of Miaopu suggests that there was a change in production organization from a holistic to a prescriptive mode of production. Li observed this production change at other Anyang bronze foundries as well and related it to an increase in demand towards the end of the Late Shang. Li receives the terms holistic and prescriptive from Franklin.⁵⁰ In holistic technology, the manufacturing process is conducted in a single, stepwise process by one artisan. In prescriptive technology, the process is broken down to individual units that can be manufactured by different individuals. In this process, someone, for example a manager, has to have control over the entire process in order for the artifact to be finished. Such a drastic change in production technology was bound affect also the social relations of those working and living at the site.

Both the structural evidence analyzed by Li and the artifactual material I examined in my dissertation suggest that during its circa 200-year occupation the site underwent significant changes. These changes seem to have included not only the bronze-production technology used but also the social interactions and relationships of the site's occupants. Mere examination of published material does not, however, allow us to draw very detailed conclusions concerning the nature of these social changes. Analysis of the changes in the technological style of three vessels forms from Miaopu, however, is very informative in this respect.

Methodology and the Dataset

As I mentioned above, I consider use to be an important part of the technological style of an individual artifact. Use is every bit as habitual and depended on cultural conventions as are decisions made during the manufacture of the object. In the case of ceramics, the use a ceramic vessel

is put to depends on its morphological and physical properties, which in turn are determined by the “mechanical performance characteristics”⁵¹ of the vessel, i.e. how well suited the vessel is for different tasks. Thus, by analyzing and comparing the morphological and physical properties of vessel forms it is possible to identify this intended function. Vessels may not, however, always be used in the intended function, but could be used for something else, the actual function. This actual function may leave patterned marks on the vessel, which archaeologists can study. In this study, I examine both the formal aspects of *li* tripods, *pen* basins and *gui* pedestal bowls and the use-wear patterning on them as manifestations of their technological style.

I had 44 whole and reconstructed *li*, 31 *gui*, and 20 *pen* vessels excavated from Miaopu in the early years of the 1960s in my dataset. When appropriate I expanded this dataset with vessels from Dasikongcun, another Late Shang site from Anyang (Figure I-3). The Dasikongcun vessels added another 22 *li*, 7 *pen*, and *gui* into the analysis. Before combining the dataset for each vessel type, I first determined whether the vessel sets from the two sites differed in any respect.⁵² The only case where the vessel sets were different enough not to warrant grouping them together was with Late Phase *li* vessels hence in this article my dataset for the Late Phase *li* consists of vessels only from Miaopu. I collected the data at the Anyang workstation of the Institute of Archaeology of the Chinese Academy of Social Sciences during two study seasons during the 2001-2002 academic year. I did not have the complete set of vessels mentioned in the 1987 report of Miaopu and Dasikongcun report⁵³ at my disposal for several reasons relating to vessel curation.⁵⁴ I was, however, able to analyze a selection of vessels from the currently unpublished excavations of 1962-64.⁵⁵ This selection remained at my disposal throughout the whole study season and thus they formed the standard against which I was able to calibrate my verbal descriptions of use-wear patterning and frequency. Some of the vessels in my dataset were published in the 1987 report and hence I was able to assign them into a correct period using that report. I dated the non-published vessels myself by comparing them to published Anyang vessels.

For every vessel, I recorded both paste and size related information as well as use-wear information.⁵⁶ Size-related information for *li* vessels includes total height of the vessel, orifice diameter, and maximum diameter. I measured the wall thickness just under the orifice. I also measured their volume by filling the vessel with millet grains and measuring how much