State Emergence in Early China

Li Liu

Archaeology Program, School of Historical and European Studies, La Trobe University, Melbourne VIC 3086, Australia; email: l.liu@latrobe.edu.au

Annu. Rev. Anthropol. 2009. 38:217–32

First published online as a Review in Advance on June 19, 2009

The *Annual Review of Anthropology* is online at anthro.annualreviews.org

This article's doi:
10.1146/annurev-anthro-091908-164513

0084-6570/09/1021-0217$20.00

Key Words

Chinese civilization, Longshan culture, Xia dynasty, Erlitou

Abstract

Questions relating to state emergence in China are often intertwined with the origins of early dynasties. This subject involves many disciplines, including archaeology, history, and anthropology, and scholars from these fields often employ different definitions for states/civilization, use various approaches, and address diverse issues. This article intends to provide an overview of major archaeological findings, approaches, interpretations, and debates on certain issues. Controversial questions include whether some of late Neolithic polities can be considered early states, and whether ancient textual accounts can be used to guide archaeological interpretations. It may not be possible in the near future to alter the historiographically determined approach, which pervades Chinese archaeology, but social-archaeology methods for investigating the political-economic system on regional and interregional scales have proven productive.

INTRODUCTION

China is one of the oldest civilizations in the world and also has a long historical record, which provides rich information concerning China's cultural origins. Questions relating to state emergence are often intertwined with the development of early dynasties. This subject involves many disciplines, including archaeology, history, and anthropology, and scholars from these fields often employ different approaches and address different issues. This article provides an overview of major archaeological findings, different approaches, diverse interpretations, and debates on certain issues. Because this review is written for English readers, I use primarily English sources when available. The chronology and location of major archaeological cultures and sites relevant to this study are shown in **Table 1** and **Figure 1**.

BACKGROUND

Modern archaeology conducted by Chinese archaeologists began in the 1920s and was the result of interplay among the Chinese traditions of historiography, the introduction of Western scientific methodology, and rising nationalism. The primary objective was to reconstruct national history, particularly to reveal the origins of early dynasties: the Xia, Shang, and Zhou, which emerged in the Central Plains of the Middle Yellow River valley (Falkenhausen 1993, Liu & Chen 2001a). The first site excavated by a Chinese-led archaeology team was Yinxu (the ruins of Yin/Shang) in Anyang, Henan, which has been confirmed as a capital of the late Shang dynasty (Li 1977). This project was the first time that archaeologists proved legends to be real history, i.e., verifiable by material evidence. The success of the Anyang excavations heightened archaeologists' confidence that more remains of early dynasties, especially the Xia and early Shang, could also be found.

Archaeological investigations of the prehistoric period have been significantly influenced by legendary accounts in ancient texts, an approach resulting from the strong historiographical tradition (Falkenhausen 1993) coupled with a research tendency toward the reconstruction of national history (Liu & Xu 2007). In addition, theoretical orientations employed in Chinese archaeology during the second half of the twentieth century were defined primarily by classical evolutionary models derived from Morgan (1963 [1877]), Engels (1972 [1884]), and Childe (1950), which regard social change as a unilineal process (Tong 1995). Such a complex of native and imported intellectual influences has helped to shape the research questions and interpretations relating to the trajectories of early states (Liu 2004, pp. 1–10).

Chinese archaeology has been a fast-developing field in recent decades owing to the rapid economic growth in the country. Several large urban sites, such as Erlitou, Yanshi,

Table 1 Chronology of archaeological cultures concerned

Time (B.C.)	Liao River	Middle Yellow River	Lower Yellow River	Middle Yangzi River	Lower Yangzi River
4000–3000	Hongshan	Yangshao	Dawenkou	Qujialing	Hemudu-Majiabang
3000–2600/2500	Xiaoheyan	Early Longshan			Liangzhu
2600/2500–2000/1900	?	Late Longshan	Longshan	Shijiahe	
1900/1800–1600/1500	Lower Xiajiadian	Erlitou	Yueshi	Lower Zaoshi	Maqiao
1600–1400	?	Erligang	Yueshi-Erligang	Panlongcheng-Baota	
1400–1300		Middle Shang	Yueshi-Shang		
1300–1026		Late Shang			Hushu

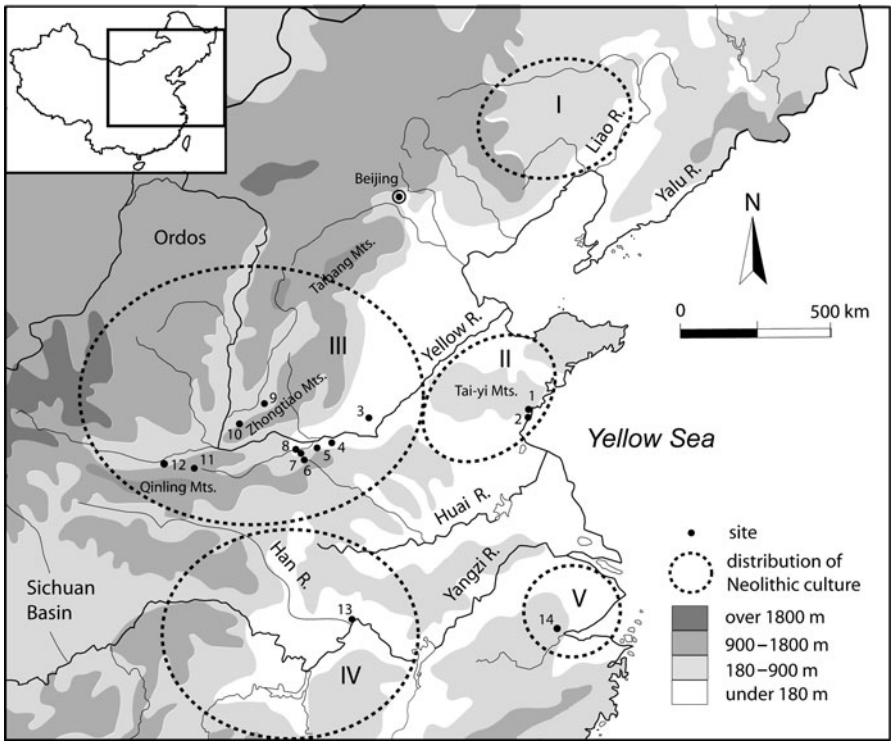

Figure 1

Distribution of cultures and sites mentioned in the text. Cultures: I, Hongshan; II, Dawenkou-Shandong Longshan; III, Yangshao-Longshan; IV, Qujialing; V, Liangzhu. Sites: 1, Liangchengzhen; 2, Yaowangcheng; 3, Anyang/Yinxuj; 4, Zhengzhou; 5, Wangchenggang; 6, Nanwa; 7, Huizui; 8, Erlitou, Yanshi; 9, Taosi; 10, Dongxiafeng; 11, Donglongshan; 12, Laoniupo; 13, Panlongcheng; 14, Mojiaoshan.

Zhengzhou, and Anyang, have been found in the Central Plains where the Xia and Shang dynasties are believed to have emerged. Excavations at these sites have indeed testified to the development of early states there. Many astonishing discoveries have also been made in regions outside the Central Plains, revealing some highly developed Neolithic and Bronze Age cultures with local characteristics. These new findings in the latter category have challenged the traditional view that the most advanced civilization centers first emerged in the Central Plains and then diffused to the surrounding regions. As a result, Chang (1986) and Su (Su & Yin 1981, Wang 1997) developed new interpretations, emphasizing the importance of regional interactions prior to the rise of early states/civilizations.

Su's *quxi leixing* (regional systems and local cultural series) model describes regional variations of archaeological culture and diverse trajectories toward civilization in different parts of China (Su 1999, Su & Yin 1981, Wang 1997). This model is then coupled with Su's three-part evolutionary hierarchy: *guguo—fangguo—diguo* (archaic state—regional state—empire), which outlines the sociopolitical transformation from the Neolithic to the dynastic periods (Su 1999, pp. 129–67). Despite some strong criticism on the vagueness of these generalizations (An 1993), Su's two models together have become an influential methodological framework in China, encouraging many archaeologists to pursue regional developmental trajectories and to classify their findings into seemingly appropriate evolutionary stages.

Since the 1990s, an increasing number of Sino-foreign collaborative projects have been carried out in China, many focusing on regional settlement patterns in relation to the process of social change and state formation. These projects have covered many regions, including southeast Shandong (Underhill et al. 1998, 2002, 2008), the Huan River valley in northern Henan (Sino-Am. Huan 1998), the Yiluo River in western Henan (Liu & Chen 2007, Liu et al. 2002–2004), and the Liao River in the Northeast (Linduff et al. 2002–2004, Chifeng 2003). These projects have employed more up-to-date methods and theory from Western anthropological archaeology traditions aiming to provide systematic data for the study of social evolution in China. Based on the data generated from these projects, fluctuations in three variables of settlement pattern—site number, size of the largest site, and settlement hierarchy—that are indicative of the degree of social complexity are present in all regions, but each appears to have its unique cycles of social development and decline. The most striking difference among these regions occurred during the first half of the second millennium B.C. when the Central Plains experienced political solidarity and integration, as indicated by the emergence of a large urbanized and state-level political center at Erlitou in the Yiluo basin. In contrast, all other regions witnessed either a perceivable reduction in population density with no observable settlement hierarchy (southeast Shandong and the Huan River region) or decentralized intergroup conflict (the Liao River valley) (Liu & Chen 2001c). These investigations have made significant contributions to our understanding of social change from a cross-regional comparative perspective.

RESEARCH PROBLEMS

There is a lack of consensus about where, when, and how the first state emerged in China. Two problems are primarily responsible for causing confusion. First, the term "state" has been used interchangeably with the word "civilization" in Chinese archaeology literature; "civilization" occurs more frequently than "state." Because civilization is often used in a more general way than state, and different scholars usually employ different definitions for these two concepts, many interpretations are ambiguous. Nevertheless, two recent studies have attempted to clarify the relationship between these concepts. Allan (2007) argues that a common elite culture, which was associated with a particular set of religious practices, was first crystallized in the region centered at Erlitou. Erlitou thus represents the highest form of political organization (a state) at the early part of the second millennum B.C., whereas the common elite culture associated with Erlitou may be called a civilization. A similar treatment to the two concepts is also given by Yoffee & Li (2009), who suggest that early states as the governmental center of a society were created in cities, whereas a set of cultural values as a civilization was shared by several early microstates. Although the terminology remains a problem, in this review article I do not impose a rigid distinction between the two terms when they were used interchangeably in the original literature.

Second, diverse scholarly traditions exist regarding the relationships between archaeological site/culture and early dynasties mentioned in textual records. This situation also leads to disputes over the nature of early states.

Definitions and Approaches

Investigators use three general approaches to study state formation, which may be traced back to different preferences toward defining the state, as held by particular scholarly traditions.

Xia Nai's approach. The interchangeable usage of civilization/state was first explicitly employed by Xia Nai (1985, p. 81), who wrote that "civilization refers to a society in which the clan system has disintegrated and a state organization with class differentiation has formed." Influenced by Gordon Childe's concept of urban revolution, Xia identified four essential and archaeologically detectable criteria for defining civilization/state: (*a*) state-level political organization (characterized by class differentiation),

(*b*) urban center of political, economic, and cultural/religious activity, (*c*) writing, and (*d*) metallurgy. He further suggested that civilization in China had emerged in the Erlitou culture (1900/1800–1500 B.C.) in Henan, at least in its late phase (Xia 1985, pp. 79–106).

Xia (1985, p. 96) regarded himself as a conservative archaeologist. When Xia published his article on the origins of Chinese civilization in the 1980s, Erlitou was the only site revealing archaeological evidence that met his criteria for a state. The current archaeological record shows that the level of social complexity observable at Erlitou has not been surpassed by any archaeological cultures prior to or contemporary with it (more discussion below). This approach, which emphasizes hard archaeological evidence with less concern for textual information, has not been very popular in China. Most publications relating to the Erlitou culture attempt to provide it with dynastic affiliations (see Du & Xu 2006, Inst. Archaeol. 2003). However, some new research has shown that Xia's principle needs to be reconsidered; archaeological information and historical records relating to prehistoric societies should be dealt with independently before they can be considered together (Liu 2004, pp. 9–10; Liu & Chen 2003; Liu & Xu 2007).

Su Bingqi's approach. Su Bingqi (1999) took a more radical approach than Xia Nai, using the term civilization loosely and without a clear definition. He traced the early development of some cultural traits to the Neolithic period more than 5000 years ago and described these traits as signifying the dawn of civilization, manifest in archaic states. These characteristics include walled settlements, jade objects with dragon designs, large public architecture, and burial differentiation. Because such traits could be found in many regions, Su (1999) described this situation as *mantian xingdou* ("the sky full of stars") at the dawn of civilization. He further suggested that there were many regional trajectories toward civilization and that such processes started more than 5000 years ago. He also proposed three pathways to early states in different regions: fission, clash, and amalgamation (pp. 119–27). The examples he used highlight changes in artifactual styles and archaeological features found in different sites over several thousand years; therefore, Su's models seem to be related more to general cultural evolution than to the process of state formation.

Su's view has been shared by many archaeologists and historians in China, who believe that the origins of civilization/state should be traced back to Neolithic times (e.g., Li 1997, Yan 2000, Zhang 2000). Examples of these early civilizations include many archaeological cultures, such as Late Yangshao, Hongshan, Dawenkou, Qujialing, Liangzhu, and Longshan, dating to the fifth through third millennia B.C. (Zhang 2000). In these studies, the presence of hierarchical society and construction of public buildings and settlement fortifications are most frequently cited as marking the emergence of early states (e.g., Li 1997, pp. 7–10). Although opposing views have appeared (e.g., An 1993, Chen 1987), this approach seems to have gained more momentum in recent years, as new discoveries from several late Neolithic cultures have shown construction of large-scale public architecture, such as rammed-earth enclosure, and evolution of rather advanced social organization during the third millennium B.C. These discoveries of complex Neolithic societies are particularly exemplified by Taosi in southern Shanxi, Wangchenggang in central Henan, and the Liangzhu site cluster in Yuhang, Zhejiang. They all show large rammed-earth enclosures (more discussion below).

Social archaeological approach. Two Sino-foreign collaborative and interdisciplinary projects in southeast Shandong and the Yiluo basin (Henan) are also concerned with issues of state formation. These projects, involving full-coverage regional survey and excavation, employ the methodology of settlement archaeology to study social change from a regional perspective (e.g., Adams & Jones 1981, Feinman 1995, Fish & Kowalewski 1990, Kowalewski 1989, Wilson 1988, Wright 1984). For this approach, a state is defined as

a society with a minimum of two social strata: a professional ruling class and a commoner class. The ruling class is characterized by a centralized decision-making process, which is both externally specialized, with regard to the local processes it regulates, and internally specialized in that the central process is divisible into separate activities, which can be performed in different places at different times (Marcus & Feinman 1998, p. 4; Wright 1977, p. 383). Furthermore, a state-level social organization often develops at minimum a four-tiered regional settlement hierarchy, equivalent to three or more levels of political hierarchy (Earle 1991, p. 3; Flannery 1998, pp. 16–21; Wright 1977, p. 389; Wright & Johnson 1975).

In southeastern Shandong, settlement patterns show a long period of population development and decline from the Neolithic to the Han dynasty (~3000 B.C.–A.D. 200). During the late Neolithic Longshan culture (2600–2000 B.C.) the research region (1120 km^2) witnessed the rise of two very large centers at Liangchengzhen (272.5 ha) and Yaowangcheng (367.5 ha), each dominating a settlement system with three tiers of political hierarchy (Underhill et al. 2008). Extensive excavations at Liangchengzhen show that this settlement was densely populated, was enclosed by ditches (Sino-Am. Collab. 2004), and functioned as a center of craft production for making stone tools (Bennett 2008, Cunnar 2007) and possibly jade objects (Liu 1988). All these findings seem to suggest a state-level social organization, although the project team hesitates to claim that these developments amount to state formation before investigators can carry out further excavations (Underhill et al. 2008).

In the Yiluo region, settlement patterns show a rapid process of population nucleation during the Erlitou period, when a large urban center developed at the Erlitou site (300 ha) and the settlement system in the survey region (860 km^2) shows three tiers of political hierarchy (Erlitou 2005, Liu et al. 2002–2004). On the basis of archaeological information from regional surveys and excavations performed at Erlitou and other sites within and beyond the Yiluo basin, there is little doubt that Erlitou developed into a state-level society (Lee 2004, Liu 2006, Liu et al. 2007, Liu & Chen 2003) (more discussion below).

Archaeology versus Textual Record

China's long historical record provides rich information concerning its cultural origins, which often refer to the Three Sovereigns, Five Emperors, and Three Dynasties (Xia, Shang and Zhou; ~2100–200 B.C.). In archaeology, although the discovery of Yinxu was an encouraging success, it has proven difficult and controversial to match archaeological sites with prehistoric cities or places mentioned in historical accounts, which may be treated as legends and oral history (Liu & Xu 2007). Nevertheless, many Chinese archaeologists are determined to search for the cultural remains of early dynasties, particularly the Xia, and the final goal is to reconstruct a dynastic history by integrating archaeological data with the received historical record, including legendary traditions (Inst. Archaeol. 2003, pp. 21–23). This approach has been heightened by several state-organized projects, namely the Xia-Shang-Zhou Chronology Project in the 1990s and the subsequently developed Searching for the Origins of Chinese Civilization Project. Both projects have employed interdisciplinary approaches. The former aimed to provide the traditional historiographic accounts a firmer chronological base (Lee 2002), whereas the latter attempts to determine dynastic origins and the earliest civilizations in the Neolithic times and early Bronze Age (Yuan & Campbell 2008).

During recent decades several ancient urban sites have been unearthed in the Central Plains, and some of them indeed roughly coincide in time and space with early dynastic capitals recorded in ancient texts. Much of the discussion has been focused on the site of Erlitou, but judgments about it are controversial. Many archaeologists have been concerned primarily with the correlation between this site and early dynasties, either Xia or Shang (see summary in Liu & Xu 2007), and the majority

of them believe that Erlitou represents the material remains of a capital city of the late Xia dynasty (e.g., Chang 1999, Childs-Johnson 1995, Du 1991, Gao et al. 1998, Li 1997, Zou 1980). Furthermore, the efforts to identify the Xia dynasty have been extended to the Late Neolithic period in recent years, as some large Neolithic sites enclosed with walls or ditches have been found at Wangchenggang and Xinzhai, both in central Henan (Cent. Stud. Anc. Civiliz. 2004, Sch. Archaeol. Museol. Peking Univ. 2007).

However, not all researchers in China agree to connect archaeological sites with prehistoric polities mentioned in ancient textual accounts (e.g., Wang 2006), and some are reluctant to affirm a direct link between Erlitou and early dynasties, owing to insufficient evidence (Liu & Chen 2003, Liu & Xu 2007, Xia 1985). Many sinologists in the West are particularly skeptical about the reliability of textual information—and thus about the claimed historical connection between Erlitou and Xia (e.g., Allan 1991; Bagley 1999, pp. 130–31; Keightley 1983; Linduff 1998, p. 629; Thorp 1991, 2006). These debates are likely to continue for some time, but it should be noted that increasing numbers of sinologists have recently begun to accept that Erlitou shows a high degree of cultural-political sophistication, which can be seen as indicating a civilization or state-level society (e.g., Allan 2007).

Nature and Form of Early States

Another research topic concerning early states analyzes their general nature and form, viewed from a cross-cultural comparative perspective. Several models have been employed to describe early states in China. During the late twentieth century, discussions focused mainly on the late Shang dynasty, and the conclusions were controversial. The late Shang was described as city-states (Lin 1998, Yates 1997), segmentary states (Keightley 2000; Southall 1993, p. 33), territorial states (Trigger 1999), and village states (Maisels 1990, pp. 12–13, 254–61). These four models can be grouped into two types: city-states and segmentary state, on the one hand, and territorial state and village-state, on the other. Major disputes between the two camps concern the political structure and the territorial size of early states (see summary in Liu & Chen 2003). However, because scholars usually have different understandings of political territory and use different criteria to measure it, their conclusions regarding the same political entity often vary considerably. In regards to the late Shang dynasty centered in Anyang, for example, some scholars argue for a very large territorial state (Trigger 1999), whereas others suggest a rather small city-state or segmentary state (Keightley 2000, Lin 1998, Yates 1997). Chinese archaeologists often determine the Shang political boundaries using the distribution of the ceramic and bronze styles and tend to claim a relatively large territory, including the entire middle and lower Yellow River and to the north of the Yangzi River (Song 1991, p. 201). In contrast, some sinologists regard only the Shang core area as its territory, covering a small region on the middle Yellow River (Wheatley 1971, p. 97). Crucial to the resolution of this dispute is some agreed understanding of the relationship between the distribution of a material culture and the administrative territory of a polity. Recent studies have suggested that regions characterized by Shang cultural remains were by no means all under direct political control of the Shang court (Liu 2009, Xu 1998), and the late Shang territory appears to have been considerably smaller than the early Shang (Tang 2001). Notably, Xu (1998) argues that there was a cultural sphere of bronze ritual objects in the Shang period, which was much greater in area than the Shang political boundry. This observation echoes Allan's (2007) and Yoffee & Li's (2009) concept of civilization as a set of common cultural values.

In the past decade, as more archaeological data became available, researchers shifted to the Erlitou and Erligang cultures for understanding the emergence of early states. As both the Erlitou and Erligang cultures show evidence of territorial expansion, and the relationship between core and periphery was characterized by control of vital resources, these two polities

have been interpreted as territorial states (Liu & Chen 2003).

General cross-cultural comparative research is a useful approach for understanding both the level of social complexity and the nature of political organization involved in state formation. But we should not become too obsessed with classification of state types. Two recent studies by Campbell (2007) and Li (2008) attempted alternative approaches. They employed Baines & Yoffee's (1998) notion of civilization as a shared cultural order in which early states were embedded and further explored multifaceted interrelationships between the Shang and its neighboring polities. Campbell (2007) criticizes previous interpretations of early states in China as functionalist and typological and shows that the Late Shang political landscape is a picture of overlapping material, practical, and discursive networks forming concentric but distinctive spheres of authority. Likewise, Li (2008) investigates the interaction between humans and animals, using the faunal remains from a regional center, at Daxinzhuang in Shandong, which reflects the process of "becoming Shang." This process is conceptualized as reconciling ongoing tensions between the state's claim to supremacy and diverse local circumstances.

ARCHAEOLOGY OF STATE EMERGENCE IN CHINA

Although some archaeologists believe that early states emerged in many parts of China more than 5000 years ago, current archaeological data suggest that some late Neolithic cultures of the third millennium B.C. and the Erlitou culture are the best candidates for recognition as pristine states, with Erlitou showing the strongest evidence.

State Emergence in the Late Neolithic Cultures

Three Neolithic cultures/variants often assigned to the category of early states are Taosi, Wangchenggang, and Liangzhu.

Taosi (2600–2000 B.C.) was a regional center in the Linfen basin, southern Shanxi. No full-coverage regional survey has been conducted there, but nonsystematic surveys have identified some 50 late Longshan sites, forming a three-tiered site hierarchy in the basin (Liu 2004, pp. 170–76). During its heyday, Taosi was encircled by large rammed-earth walls (280 ha), its elite residences appear to have been separated from commoners by walled enclosures, and social hierarchy was clearly expressed in mortuary practice. The site was also a craft production center for stone artifacts and pottery vessels. A large, semicircular rammed-earth structure (1 ha) has been identified as an astronomical observatory (Liu 2004; Shanxi Team IACASS et al. 2003, pp. 109–13; 2005; 2007). Taosi apparently was a major political, economic, and ritual center in the region. As seasonal changes were crucial moments for Neolithic farming societies, by which to schedule their agricultural activities, the Taosi elite may have held great ritual power by possessing astronomical knowledge needed to determine the calendar. In addition, two glyphs painted in red pigment were found on a pottery vessel. They have been identified as characters for "wen yi," which are believed to have referred to a capital of the Xia dynasty (Feng 2008). This site has been interpreted not only as an early state, but also as a political center affiliated with either the Xia dynasty or predynastic kings, such as Yao and Shun; all were active in south Shanxi, according to ancient texts (Xie 2006). Nevertheless, owing to a lack of full-coverage regional survey, we are not clear about the Taosi polity's level of social complexity, considered from a regional perspective.

Wangchenggang in Dengfeng is located on a terraced area in the alluvial region of central Henan. During the late Longshan period, this region was characterized by a multicentered competitive settlement system, in which some centers were enclosed by rammed-earth fortifications (Liu 2004, pp. 182–85). Wangchenggang (~2200–1835 B.C.) was such an enclosed site and served as the settlement center for 22 unwalled sites distributed in the upper Ying River valley. At Wangchenggang, two connected small rammed-earth enclosures

(~1 ha each) were built around 2200 B.C., and a large enclosure (35 ha) was constructed by ~2100–2050 B.C. Many ash pits were unearthed at the site, some containing human sacrifices. This site was also a craft-production center, judging from stone drills and blanks, uncovered there, for making spades, axes, knives, and sickles (Henan Inst. Cult. Relics 1992, Sch. Archaeol. Museol. Peking Univ. 2007).

Wangchenggang's status as a state has to do with its location, which coincides with Yangcheng, the capital city said to have been established by Yu the Great, who founded the Xia dynasty according to textual accounts. Since the discovery, in 1977, of small internal enclosures, suggesting a segregated ruling elite, Wangchenggang has often been regarded as the ancestral place of the Xia dynasty (Henan 1992). The recent discovery of the large urban enclosure has promoted a new interpretation, that the small enclosures were built by Guan, the legendary father of Yu the Great, and the large town walls by Yu himself (Sch. Archaeol. Museol. Peking Univ. 2007). Nevertheless, such an attribution fails to explain a gap of some 100 years between the two constructions at Wangchenggang.

The Liangzhu site cluster in Yuhang. The Liangzhu culture (3100–2200 B.C.) is distributed in the Lower Yangzi River region. The site density is particularly high in the Yuhang district, Zhejiang. A group of 135 sites/locales have been identified in an area of 33.8 km^2 there. The central place is located at Mojiaoshan, which is a man-made terrace, about 10 m high and 30 ha in area. Several rammed-earth architectural foundations, up to 3 ha in size, were situated on top of this large terrace. Mojiaoshan, together with several smaller sites, was surrounded by a large rammed-earth enclosure (290 ha), which was built during the late Liangzhu period. Liangzhu sites can be categorized into several functional types: the large ritual center at Mojiaoshan, sacrificial altars, burial sites, residential sites, and jade and pottery workshops. In addition, a rammed-earth wall, 5-km long and 20–50-m wide, was built parallel to the Tianmu mountain range in the north of the site cluster; it may have been constructed for flood control (Zhejiang 2005, 2008). The Liangzhu culture is well known for its large numbers of elaborate jade items unearthed from burial sites (Huang 1992, Mou & Yun 1992). Many jade forms appear to have embodied complex symbolic meanings (Chang 1989), and some bear pictographic symbols (Keightley 2006, Yang 2000). Some elite individuals may have been involved in manufacturing these prestige items, and Liangzhu jade, together with its symbolic meanings, had great influence on many Neolithic cultures in other regions (Liu 2003).

Different from its Central Plains' counterparts, the Liangzhu culture left no trace in ancient texts, so interpretations of its material remains rely completely on archaeology. Given that enormous amounts of construction and jade working were carried out by the Liangzhu people, and social hierarchy was clearly expressed in their mortuary practice, it is possible that a state-like social organization emerged there.

These Neolithic societies appear to have declined after their heydays. While the Liangzhu culture and Taosi site disappeared from the archaeological record, Wangchenggang became an ordinary village during the succeeding Erlitou period. The causes for such declines are still matters of ongoing investigations and are probably attributable to both environmental and social factors (Liu 2000, 2004; Stanley et al. 1999).

State Emergence in the Bronze Age

During the second millennium B.C., the Central Plains witnessed the rise of the Erlitou and then Erligang cultures, centered in the Yiluo basin and Zhengzhou area, respectively. They represent the earliest Bronze Age civilization/states in China.

The Erlitou state. Settlement patterns in the Yiluo basin show a clear trend of increasing site hierarchy and nucleated population

through time. A mono-centered and highly integrated political entity emerged around 1900–1800 B.C., with Erlitou serving as the dominant central place and 190 smaller sites forming a four-tiered settlement hierarchy (Erlitou Work. Team IACASS 2005, Liu et al. 2002–2004, Qiao 2007).

The Erlitou urban center expanded rapidly from 100 ha to 300 ha within 100 years. The palatial complex, within a rammed-earth enclosure (12 ha), was located almost in the center of the site, forming a clear residential segregation between the high elite and the rest of the population. Enclosed bronze and turquoise workshops were situated immediately south of the palatial complex, suggesting a close control of the production of these prestige goods by the high elite, and the craftsmen may have been attached specialists. The bronze and turquoise artifacts have been found mainly in high elite burials, suggesting that these prestige items were distributed to form elite networks (Inst. Archaeol. CASS 1999, Liu 2006, Liu & Xu 2007). About a dozen types of pottery marks have been found, but they cannot be identified as a writing system (Qiu 1988).

Elite burials at Erlitou were normally associated with bronzes, jades, turquoise objects, and white pottery vessels. One of the high-ranking burials contained a dragon-shaped artifact, which was made of ~2000 pieces of turquoise and jade and placed on top of the skeleton (Liu & Xu 2007). Because the dragon has traditionally been regarded as a mythical animal with enormous supernatural powers, its association with a high-ranking burial seems to suggest that the Erlitou elite assumed great ritual power.

Some secondary centers in the Erlitou hinterland became specialized in manufacturing craft products. Huizui in Yanshi, for example, was a locale of stone tool production, particularly quarrying locally available dolomite for making spades (Ford 2007, Webb et al. 2007). Nanwa in Dengfeng may have been one of the sites that produced prestige white pottery with kaolinic clay (Li et al. 2008). These products appear to have been distributed to many sites in the Yiluo basin, including Erlitou. But there is no evidence that Erlitou controlled the circulation of these goods. These phenomena suggest multifaceted interactions between Erlitou and its hinterland. Whereas Erlitou elites may have assumed positions of highest political and religious authority in the region, minor elite individuals in local centers also constructed their own power networks by exchanging various utilitarian and ritual items. All these relationships formed a complex political-economic system in the core area of the state (Liu et al. 2007).

Erlitou also expanded its power to more distant areas, where important resources were found in abundance, such as salt, copper, and precious stones. Outposts may have been set up in these regions to procure and transport various local resources; such places include Dongxiafeng near the Zhongtiao Mountains, Donglongshan in the Qinling Mountains, and Panlongcheng in the middle Yangzi River (Liu & Chen 2001b, 2003). It is by no means to suggest that the Erlitou political territory is equivalent to the enormous region encircling these outposts, but Erlitou's regional expansion was unprecedented and is particularly attributable to the rulers' hunger for bronze alloys, which were used to cast weapons for warfare and ceremonial vessels for ancestor-worship ritual, both activities being intended to ensure the political legitimacy of the ruling class (Chang 1983).

It is particularly notable that the Erlitou state developed during a period of climatic deterioration. In the Yiluo basin, emerging dry and cold conditions led to severe stream incision, narrowed floodplains, and reduced wetland (Rosen 2007, 2008). In the meantime, however, population size exceeded the optimum carrying capacity (Qiao 2007), and a multicropping agricultural system was established, incorporating both local domesticates (millet, rice, and possibly soybean) and newly introduced ones (wheat and barley). Multicropping would help to increase annual yields and reduce risks of crop failure (Lee et al. 2007, Lee & Bestel 2007). In the face of these environmental challenges, the new subsistence strategies manifested human responses that may have

contributed to creating and maintaining the Erlitou state.

Zhengzhou and the Erligang state. The pattern of core-periphery interaction established by the Erlitou polity appears to have continued in the succeeding polity centered in Zhengzhou, often referred to as the Erligang culture or Early Shang (~1600–1400 B.C.), although the relationship between these two polities is still a matter of debate. Zhengzhou was enclosed by two concentric rammed-earth walls, forming an inner city (300 ha) and an outer city (13 sq. km) (Yuan & Zeng 2004). The inner city contained royal palaces and temples, whereas the outer city defined the urban areas for craft production workshops, cemeteries, and residences. These workshops manufactured bronze, ceramic, and bone objects, used for both prestige and utilitarian purposes (Henan 2001). Pottery marks and some inscriptions on bones have been found, but their meanings are unclear (Inst. Archaeol. 2003, pp. 424–25). Like Erlitou, the Erligang state also established outposts in the periphery to procure important resources, including salt, copper, and proto-porcelain. The Erligang expansion reached even broader regions in all directions. These actions are likely to have been military in nature, as many of the outposts became fortified towns (Liu & Chen 2001b, 2003).

The interactions between the core and periphery during the Erlitou and Erligang periods appear to have involved interdependent relationships, although the outlying populations were much the weaker partners, politically and militarily. The regional centers in the periphery provided raw materials and exotic elite goods as tribute to the core area to support urban growth and craft production in the major center and to contribute to the formation of hierarchical sociopolitical structures. In return, the major center may have provided ritual services and redistributed prestige items as rewards to regional elites (Liu & Chen 2001c, 2003).

It is important to note that Erlitou and Zhengzhou are the only sites where evidence for casting ritual vessels has been found during each period. Several sites in the periphery have revealed remains of bronze casting, but only of tools and weapons (Liu & Chen 2001b, 2003). This observation suggests that the early states may have monopolized the production of bronze ritual vessels. This situation did not change until the Late Shang when the power structure was altered and some regional polities (such as Laoniupo near Xi'an) began to produce their own ritual vessels (Liu 2009). Although the proposition needs to be tested in the future, this scenario is consistent with the general circumstances that bronze vessels were sacred items used in ancestral worship ritual, which was one of the most important state affairs during the early Bronze Age (Chang 1983, 1991).

CONCLUSIONS

Study of state formation, and of the emergence of civilization, has come a long way since the beginning of modern archaeology in China, but many questions remain unsolved. One problem is whether some of the late Neolithic polities can be considered early states. If so, then early states in China would have appeared as peer-polities, as defined by Renfrew (1982, 1986). The argument for the formation of early states in the late Neolithic period has been gaining momentum recently in China, particularly owing to the new discovery of large public architectures at Taosi and Mojiaoshan. Yoffee & Li (2009) also express that some characteristics of early states have been noted in the Taosi walled site. At present, however, we do not have sufficient evidence to determine typologically the nature of these polities.

Less controversial is the definition of Erlitou and Erligang as states. Many similarities exist between the Neolithic polities and these two Bronze Age states, such as social stratification, construction of large public architecture, and production of prestige ritual objects and utilitarian items in regional centers. Signs and marks have been found in many late Neolithic sites, as well as in Erlitou and Erligang. However, it is difficult and controversial to

assess their phonetic values, which by definition are required for writing (Boltz 1986, Keightley 2006, Li et al. 2003, Yang 2000). A major difference between these Neolithic and early Bronze Age polities is the scale of energy expenditure that the ruling elite was able to manipulate for creating and maintaining power. The production of prestige ritual items provides a tangible example of this contrast. On the one hand, Neolithic production of elite-goods, such as jade and fine pottery, normally involved local resources and manufacture, which would have required relatively low levels of managerial operation and energy expenditure. On the other hand, bronze production in the Erlitou and Erligang cultures, including mining, smelting, and casting, embraced much greater geographic catchments for transporting raw material and required more complex technology and management for production, as compared with Neolithic manufacturing (Franklin 1983, Liu 2003). Such extraordinary efforts invested in production of bronze weapons and ritual vessels testify to the importance of these products as sources and instruments of political legitimacy for the ruling elite. Adopting Baines & Yoffee's (1998) and Allan's (2007) concept of shared elite cultural value as civilization, it is also clear that Erlitou is markedly different from these late Neolithic cultures in terms of its much greater sphere of a common elite culture.

Based on current archaeological information, we are still unable to pinpoint the exact moment when the first state emerged. It is also less than productive to match archaeological remains with legendary places and individuals. Nevertheless, archaeological data can help us to understand general trajectories toward state formation. We need to study not only how these early states operated in urban centers, the rural hinterland, and periphery, but also how states and other polities interacted with each other. It may not be possible in the near future to alter the historiographically determined approach, which pervades Chinese archaeology, but we can develop new approaches for investigating the political-economic system on regional and interregional scales. An anthropological dimension in the study of state emergence in China certainly needs to be encouraged.

DISCLOSURE STATEMENT

The author is not aware of any affiliations, memberships, funding, or financial holdings that might be perceived as affecting the objectivity of this review.

ACKNOWLEDGMENTS

I am grateful to the constructive comments by Xingcan Chen and an anonymous reviewer. Yu Qiao helped with map drawing, and Thomas Bartlett edited the English.

LITERATURE CITED

Adams REW, Jones RC. 1981. Spatial patterns and regional growth among Classic Maya cities. *Am. Antiq.* 46:301–22

Allan S. 1991. *The Shape of the Turtle: Myth, Art and Cosmos in Early China*. Albany: State Univ. NY

Allan S. 2007. Erlitou and the formation of Chinese civilization: toward a new paradigm. *J. Asian Stud.* 66:461–96

An Z. 1993. Lun huan Bohai de shiqian wenhua—jianping "quxi" guandian. *Kaogu* 7:609–15

Bagley R. 1999. Shang archaeology. See Loewe & Shaughnessy 1999, pp. 124–231

Baines J, Yoffee N. 1998. Order, legitimacy, and wealth in Ancient Egypt and Mesopotamia. In *Archaic States*, ed. G Feinman, J Marcus, pp. 199–60. Santa Fe: Sch. Am. Res.

Bennett GP. 2008. Context and meaning in late Neolithic lithic production in China: the Longshan period in southeastern Shandong province. *Archeol. Pap. Am. Anthropol. Assoc.* 17:52–67

Boltz WG. 1986. Early Chinese writing. *World Archaeol.* 17:420–36
Campbell RB. 2007. *Blood, flesh and bones: kinship and violence in the social economy of the Late Shang*. PhD diss., Harvard Univ., Cambridge, Mass.
Cent. Stud. Anc. Civiliz., Zhengzhou Inst. Cult. Relics. 2004. Henansheng Xinmishi Xinzhai yizhi (The Xinzhai site in Xinmi city, Henan province). *Wenwu* 3:4–20
Chang K-C. 1983. *Art, Myth, and Ritual*. Cambridge, MA: Harvard Univ. Press
Chang K-C. 1986. *Archaeology of Ancient China*. New Haven, CT: Yale Univ. Press
Chang K-C. 1989. An essay on cong. *Orientations* 20:37–43
Chang K-C. 1991. Introduction: The importance of bronzes in ancient China. In *Ancient Chinese Bronze Art: Casting the Precious Sacral Vessel*, ed. WT Chase, pp. 15–18. New York: China House Gallery, China Inst. Am.
Chang K-C. 1999. China on the eve of the historical period. See Loewe & Shaughnessy 1999, pp. 37–73
Chen X. 1987. Wenming zhuyinsu de qiyuan yu wenming shidai (On the origins of the elements of civilization and the civilized era). *Kaogu* 5:437, 458–61
Chifeng Int. Collab. Archaeol. Res. Project. 2003. *Regional Archeology in Eastern Inner Mongolia: A Methodological Exploration*. Beijing: Kexue Press
Childe VG. 1950. The urban revolution. *Town Plann. Rev.* 21:3–17
Childs-Johnson E. 1995. Symbolic jades of the Erlitou period: a Xia royal tradition. *Arch. Asian Art* XLVIII:64–90
Cunnar G. 2007. *The production and use of stone tools at the Longshan Period site of Liangchengzhen, China*. PhD diss., Yale Univ., New Haven, Conn.
Du J, Xu H, eds. 2006. *Erlitou Yizhi yu Erlitou Wenhua Yanjiu (Research on the Erlitou Site and Erlitou Culture)*. Beijing: Kexue Press
Du Z. 1991. Xiadai kaogu jiqi guojia fazhan de tansuo (Archaeology of the Xia dynasty and the development of state). *Kaogu* 1:43–56
Earle TK. 1991. The evolution of chiefdom. In *Chiefdoms: Power, Economy, and Ideology*, ed. T Earle, pp. 1–15. Cambridge, UK: Cambridge Univ. Press
Engels F. 1972 [1884]. *The Origin of the Family, Private Property and the State*. New York: Int. Publ.
Erlitou Work. Team IACASS. 2005. Henan Luoyang pendi 2001–2003 nian kaogu diaocha jianbao (Report of the 2001–2003 archaeological survey in the Luoyang basin, Henan). *Kaogu* 5:18–37
Falkenhausen Lv. 1993. On the historiographical orientation of Chinese archaeology. *Antiquity* 67:839–49
Feinman G. 1995. The emergence of inequality: a focus on strategies and processes. In *Foundations of Social Inequality*, ed. DPaG Feinman, pp. 225–79. New York: Plenum
Feinman GM, Marcus J, eds. 1998. *Archaic States*. Santa Fe: Sch. Am. Res. Press
Feng S. 2008. "Wen yi" kao (On "wen yi"). *Kaogu Xuebao* 3:273–90
Fish SK, Kowalewski SA, eds. 1990. *The Archaeology of Regions: A Case for Full-Coverage Survey*. Washington, DC: Smithson. Inst. Press
Flannery KV. 1998. The ground plans of archaic states. See Feinman & Marcus 1998, pp. 15–58
Ford A. 2007. *Stone tool production-distribution systems during the Early Bronze Age at Huizui, China*. MA thesis, La Trobe Univ., Melbourne
Franklin UM. 1983. The beginnings of metallurgy in China: a comparative approach. In *The Great Bronze Age of China*, ed. G Kuwayama, pp. 94–99. Los Angeles, CA: Los Angeles County Mus.
Gao W, Yang X, Wang W, Du J. 1998. Yanshi Shangcheng yu Xia Shang wenhua fenjie (The Yanshi Shang city and the demarcation between the Xia and Shang cultures). *Kaogu* 10:66–79
Henan Inst. Cult. Relics. 1992. *Dengfeng Wangchenggang yu Yangcheng*. Beijing: Wenwu Press
Henan Inst. Cult. Relics. 2001. *Zhengzhou Shangcheng*. Beijing: Wenwu Press
Huang T-M. 1992. Liangzhu—a late Neolithic jade-yielding culture in southeastern coastal China. *Antiquity* 66:75–83
Inst. Archaeol. CASS. 1999. *Yanshi Erlitou*. Beijing: Zhongguo Dabaikequanshu Press
Inst. Archaeol. CASS. 2003. *Zhongguo Kaoguxue: Xia Shang Juan (Chinese Archaeology: The Xia and Shang Volume)*. Beijing: Zhongguo Shehui Kexue Press
Keightley DN. 1983. The late Shang state: when, where, and what? In *The Origins of Chinese Civilization*, ed. D Keightley, pp. 523–64. Berkeley: Univ. Calif. Press

Keightley DN. 2000. *The Ancestral Landscape: Time, Space, and Community in Late Shang China (ca. 1200–1045 B.C.)*. Berkeley: Inst. East Asian Stud.

Keightley DN. 2006. Marks and labels: early writing in Neolithic and Shang China. In *Archaeology of Asia*, ed. MT Stark, pp. 177–201. Malden, MA: Blackwell

Kowalewski SA. 1989. *Prehispanic Settlement Patterns in Tlacolula, Etla, and Ocotlan, the Valley of Oaxaca, Mexico*. Ann Arbor: Regents of the Univ. Mich., Mus. Anthropol.

Lee G-A, Bestel S. 2007. Contextual analysis of plant remains at the Erlitou-period Huizui site, Henan, China. *Bull. Indo-Pac. Prehist. Assoc.* 27:49–60

Lee G-A, Crawford GW, Liu L, Chen X. 2007. Plants and people from the early Neolithic to Shang periods in North China. *Proc. Natl. Acad. Sci. USA* 104:1087–92

Lee YK. 2002. Building the chronology of early Chinese history. *Asian Perspect.* 41:15–42

Lee YK. 2004. Control strategies and polity competition in the lower Yi-Luo valley, north China. *J. Anthropol. Archaeol.* 23:172–95

Li B, Liu L, Zhao J, Chen X, Feng Y, et al. 2008. Chemical fingerprinting of whitewares from Nanwa site of the Chinese Erlitou state: comparison with Gongxian and Ding kilns. *Nucl. Instrum. Methods Phys. Res. B* 266:2614–22

Li C. 1977. *Anyang*. Seattle: Univ. Wash. Press

Li M. 2008. *Conquest, concord, and consumption: becoming Shang in Eastern China*. PhD diss., Univ. Mich., Ann Arbor

Li X, ed. 1997. *Zhongguo Gudai Wenming yu Guojia Xingcheng Yanjiu (Research on Ancient Civilization and State Formation in China)*. Kunming: Yunnan Renmin Press

Li X, Harbottle G, Zhang J, Wang C. 2003. The earliest writing? Sign use in the seventh millennium BC at Jiahu, Henan Province, China. *Antiquity* 77:31–44

Lin Y. 1998. Jiaguwen zhong de Shangdai fangguo lianmeng (The confederation states of the Shang dynasty seen in oracle-bone inscriptions) (originally published in 1982 *Guwenzi yanjiu 6*). In *Lin Yun Xueshu Wenji (Collected Essays by Lin Yun)*, ed. Y Lin, pp. 69–84. Beijing: Zhongguo Dabaike Quanshu Press

Linduff K, Drennan R, Shelack G. 2002–2004. Early complex societies in NE China: the Chifeng international collaborative archaeological research project. *J. Field Archaeol.* 29:45–73

Linduff KM. 1998. The emergence and demise of bronze-producing cultures outside the Central Plain of China. In *The Bronze Age and Early Iron Age Peoples of Eastern Central Asia*, ed. VH Mair, pp. 619–46. Washington, DC: Inst. Study Man

Liu D. 1988. Youguan Rizhao Liangchengzhen yukeng yuqi de ziliao (Information on the jade objects from pits at Liangchengzhen in Rizhao). *Kaogu* 2:121–23

Liu L. 2000. The development and decline of social complexity in China: some environmental and social factors. *Indo-Pac. Prehist.: Melaka Pap. Bull. Indo-Pac. Prehist. Assoc.* 20:14–33

Liu L. 2003. "The products of minds as well as of hands": production of prestige goods in the Neolithic and early state periods of China. *Asian Perspect.* 42:1–40

Liu L. 2004. *The Chinese Neolithic: Trajectories to Early States*. Cambridge, UK: Cambridge Univ. Press

Liu L. 2006. Urbanization in China: Erlitou and its hinterland. In *Urbanism in the Preindustrial World: Cross-Cultural Approaches*, ed. G Storey, pp. 161–89. Tuscaloosa: Univ. Ala. Press

Liu L. 2009. China: state formation and urbanization. In *The Oxford Handbook of Archaeology*, ed. B Cunliffe, C Gosden, R Joyce, pp. 579–610. Oxford: Univ. Oxford Press

Liu L, Chen X. 2001a. China. In *Encyclopedia of Archaeology: History and Discoveries*, ed. T Murray, pp. 315–33. Santa Barbara: ABC-CLIO

Liu L, Chen X. 2001b. Cities and towns: the control of natural resources in early states, China. *Bull. Mus. Far East. Antiq.* 73:5–47

Liu L, Chen X. 2001c. Settlement archaeology and the study of social complexity in China. *Rev. Archaeol.* 22(2):4–21

Liu L, Chen X. 2003. *State Formation in Early China*. London: Duckworth

Liu L, Chen X. 2007. Multidisciplinary research in the Yiluo Project: after 10 years. *Bull. Indo-Pac. Prehist. Assoc.* 27:37–38

Liu L, Chen X, Lee YK, Wright H, Rosen A. 2002–2004. Settlement patterns and development of social complexity in the Yiluo region, north China. *J. Field Archaeol.* 29:75–100

Liu L, Chen X, Li B. 2007. Non-state crafts in the early Chinese state: an archaeological view from the Erlitou hinterland. *Bull. Indo-Pac. Prehist. Assoc.* 27:93–102

Liu L, Xu H. 2007. Rethinking Erlitou: legend, history and Chinese archaeology. *Antiquity* 81:886–901

Loewe M, Shaughnessy E, eds. 1999. *The Cambridge History of Ancient China: From the Origins of Civilization to 221 BC*. Cambridge, UK: Cambridge Univ. Press

Maisels C. 1990. *The Emergence of Civilization: From Hunting and Gathering to Agriculture, Cities, and the State in the Near East*. London: Routledge

Marcus J, Feinman G. 1998. Introduction. See Feinman & Marcus 1998, pp. 3–14

Morgan LH. 1963 [orig. 1877]. *Ancient Society*. New York: World Publ.

Mou Y, Yun X, eds. 1992. *Zhongguo Yuqi Quanji: Yuanshi Shehui (Selected Works on Chinese Jades: Primitive Society)*. Shijiazhuang: Hebei Meishu Press

Qiao Y. 2007. Development of complex societies in the Yiluo region: a GIS based population and agricultural area analysis. *Indo-Pac. Prehist. Assoc. Bull.* 27:61–75

Qiu X. 1988. *Wenzixue Ganyao Essentials of Philology*. Beijing: Shangwu Press

Renfrew C. 1982. Polity and power: interaction, intensification and exploitation. In *An Island Polity: The Archaeology of Exploitation in Melos*, pp. 264–90. Cambridge, UK: Cambridge Univ. Press

Renfrew C. 1986. Introduction: peer polity interaction and socio-political change. In *Peer Polity Interaction and Socio-Political Change*, ed. C Renfrew, J Cherry, pp. 1–18. Cambridge, UK: Cambridge Univ. Press

Rosen AM. 2007. The role of environmental change in the development of complex societies in China: a study from the Huizui site. *Bull. Indo-Pac. Prehist. Assoc.* 27:39–48

Rosen AM. 2008. The impact of environmental change and human land use on alluvial valleys in the Loess Plateau of China during the Middle Holocene. *Geomorphology* 101:298–307

Sch. Archaeol. Museol. Peking Univ., Henan Inst. Cult. Relics Archaeol. 2007. *Dengfeng Wangchenggang Kaogu Faxian yu Yanjiu (2002–2005) (Archaeological Discovery and Research at the Wangchenggang Site in Dengfeng [2002–2005])*. Zhengzhou: Daxiang Press

Shanxi Team IACASS, Shanxi Inst. Archaeol., Linfen Bur. Cult. Relics. 2003. Taosi chengzhi faxian Taosi wenhua zhongqi muzang (Mid-Taosi phase burials at the Taosi walled site). *Kaogu* 9:3–6

Shanxi Team IACASS, Shanxi Inst. Archaeol., Linfen Bur. Cult. Relics. 2005. Shanxi Xiangfen Taosi chengzhi 2002 nian fajue baogao (Report of 2002 excavation at the walled site at Taosi in Xiangfen, Shanxi). *Kaogu Xuebao* 3:307–46

Shanxi Team IACASS, Shanxi Inst. Archaeol., Linfen City Cult. Bur. 2007. Shanxi Xiangfenxian Taosi zhongqi chengzhi daxing jianzhu IIFJT1 jizhi 2004–2005 nian fajue jianbao (Report of 2004–2005 excavations of the large edifice IIFJT1 in the walled enclosure during the middle phase at Taosi, Xiangfen, Shanxi). *Kaogu* 4:3–25

Sino-Am. Collab. Liangcheng Archaeol. Team. 2004. Shandong Rizhao Liangchengzhen yizhi 1998–2001 nian fajue jianbao (preliminary report of the 1998–2001 excavation seasons at the Liangchengzhen site in Rizhao, Shandong). *Kaogu* 9:7–18

Sino-Am. Huan River Valley Archaeol. Team. 1998. Huanhe liuyu kaogu yanjiu chubu baogao (Preliminary report of regional archaeological research in the Huan River valley). *Kaogu* 10:13–22

Song X. 1991. *Yin Shang Wenhua Quyu Yanjiu (On the Cultural Territories of the Late Shang)*. Xi'an: Shaanxi Renmin Press

Southall A. 1993. Urban theory and the Chinese city. In *Urban Anthropology in China*, ed. GGaA Southall, pp. 19–40. Leiden: Brill

Stanley DJ, Chen Z, Song J. 1999. Inundation, sea-level rise and transition from Neolithic to Bronze Age cultures, Yangtze delta, China. *Geoarchaeology* 14:15–26

Su B. 1999. *Zhongguo Wenming Qiyuan Xintan (New Investigations on the Origins of Chinese Civilization)*. Beijing: Sanlian Press

Su B, Yin W. 1981. Guanyu kaoguxue wenhua de quxi leixing wenti (On the issue of the distribution and development of regional cultures in Chinese archaeology). *Wenwu* 5:10–17

Tang J. 2001. The construction of an archaeological chronology for the history of the Shang dynasty of early Bronze Age China. *Rev. Archaeol.* 22:35–47

Thorp RL. 1991. Erlitou and the search for the Xia. *Early China* 16:1–38

Thorp RL. 2006. *China in the Early Bronze Age: Shang Civilization*. Philadelphia: Univ. Penn. Press
Tong E. 1995. Thirty years of Chinese archaeology (1949–1979). In *Nationalism, Politics, and the Practice of Archaeology*, ed. PL Kohl, C Fawcett, pp. 177–97. Cambridge, UK: Cambridge Univ. Press
Trigger BG. 1999. Shang political organization: a comparative approach. *J. East Asian Archaeol.* 1:43–62
Underhill AP, Feinman GM, Nicholas LM, Bennett G, Cai F, et al. 1998. Systematic, regional survey in SE Shandong province, China. *J. Field Archaeol.* 25:453–74
Underhill AP, Feinman GM, Nicholas LM, Bennett G, Fang H, et al. 2002. Regional survey and the development of complex societies in southeastern Shandong, China. *Antiquity* 76:745–55
Underhill AP, Feinman GM, Nicholas LM, Fang H, Luan F, et al. 2008. Changes in regional settlement patterns and the development of complex societies in southeastern Shandong, China. *J. Anthropol. Archaeol.* 27:1–29
Wang T. 1997. The Chinese archaeological school: Su Bingqi and contemporary Chinese archaeology. *Antiquity* 71:31–39
Wang W. 2006. Guenyu zai wenming tanyuan zhong kaogu yu lishi zhenghe de sikao (Some thoughts on the integration of archaeology and history in research of the origins of civilization). *Zhongguo Shehui Kexueyuan Gudai Wenming Yanjiu Zhongxin Tongxun* 11:7–10
Webb J, Ford A, Gorton J. 2007. Influences on selection of lithic raw material sources at Huizui, a Neolithic/Early Bronze Age site in northern China. *Bull. Indo-Pac. Prehist. Assoc.* 27:76–86
Wheatley P. 1971. *The Pivot of the Four Quarters: A Preliminary Enquiry into the Origins and Character of the Ancient Chinese city*. Chicago: Aldine
Wilson D. 1988. *Prehispanic Settlement Patterns in the Lower Santa Valley, Peru*. Washington, DC: Smithson. Inst. Press
Wright HT. 1977. Recent research on the origin of the state. *Annu. Rev. Anthropol.* 6:379–97
Wright HT. 1984. Prestate political formations. In *On the Evolution of Complex Societies: Essays in Honor of Harry Hoijer*, ed. T Earle, pp. 41–77. Malibu: Undena
Wright HT, Johnson G. 1975. Population, exchange, and early state formation in southwestern Iran. *Am. Anthropol.* 77:267–89
Xia N. 1985. *Zhongguo Wenming de Qiyuan (The Origins of Chinese Civilization)*. Beijing: Wenwu Press
Xie X, ed. 2006. *Xiangfen Taosi Yizhi Yanjiu (Research on the Taosi Site in Xiangfen)*. Beijing: Kexue Press
Xu L. 1998. Wenhua yinsu dingxing fenxi yu Shangdai "qingtong liqi wenhua quan" yanjiu (An analysis of cultural elements and "cultural sphere of bronze ritual vessels"). In *Zhongguo Shang Wenhua Guoji Xueshu Taolunhui Lunwenji (Collected Papers from the International Conference on the Shang culture, China)*, ed. IACASS, pp. 227–36. Beijing: Zhongguo Dabaike Quanshu Press
Yan W. 2000. The origins of rice agriculture, pottery and cities. In *Daozuo Taoqi he Dushi de Qiyuan (The Origins of Rice Agriculture, Pottery and Cities)*, ed. W Yan, Y Yasuda, pp. 3–15. Beijing: Wenwu Press
Yang X. 2000. *Reflections of Early China: Decor, Pictographs, and Pictorial Inscriptions*. Seattle/London: Nelson-Atkins Mus. Art
Yates R. 1997. The city-state in ancient China. In *The Archaeology of City-States: Cross-Cultural Approaches*, ed. D Nichols, T Charlton, pp. 71–90. Washington, DC: Smithson. Inst. Press
Yoffee N, Li M. 2009. Wangquan, chengshi yu guojia: bijiao kaoguxue shiye zhongde zhongguo zaoqi chengshi (Kingship, city and state: China's early cities from a perspective of comparative archaeology). In *Duowei Shiyu—Shang Wangchao yu Zhongguo Zaoqi Wenming Yanjiu (Multiple Perspectives—Study of the Shang Dynasty and Early Chinese Civilizations)*, ed. Z Jing, J Tang, K Takashima, pp. 276–90. Beijing: Kexue Press
Yuan G, Zeng X. 2004. Lun Zhengzhou Shangcheng neicheng he waicheng de guanxi (Relationship between the inner walls and outer walls at the Zhengzhou Shang city). *Kaogu* 3:59–67
Yuan J, Campbell R. 2008. Recent archaeometric research on "the origins of Chinese civilization." *Antiquity* 83:96–109
Zhang Z. 2000. Zhongguo gudai wenming xingcheng de kaoguxue yanjiu (Archaeological research on the origins of ancient Chinese civilization). *Gugong Bowuyuan Yuankan* 2:5–27
Zhejiang Inst. Archaeol. 2005. *Liangzhu Yizhiqun (The Liangzhu Site Cluster)*. Beijing: Wenwu Press
Zhejiang Inst. Archaeol. 2008. Hangzhoushi Yuhangqu Liangzhu gucheng yizhi 2006–2007 nian de fajue (The 2006–2007 excavation season at the Liangzhu walled site in Yuhang district, Hangzhou city). *Kaogu* 7:3–10
Zou H. 1980. *Xia Shang Zhou Kaogu Lunwenji (Essays on the Archaeology of the Xia, Shang and Zhou Dynasties)*. Beijing: Wenwu Press

Annual Review of Anthropology
Volume 38, 2009

Contents

Prefatory Chapter

Archaeology and Anthropology: A Personal Overview of the Past Half-Century
Patty Jo Watson 1

Archaeology

Identity and Difference: Complicating Gender in Archaeology
Pamela L. Geller 65

State Emergence in Early China
Li Liu 217

Amazonian Archaeology
Michael Heckenberger and Eduardo Góes Neves 251

The Oldowan: The Tool Making of Early Hominins and Chimpanzees Compared
Nicholas Toth and Kathy Schick 289

Biological Anthropology

The Early Development of Gender Differences
Matthew H. McIntyre and Carolyn Pope Edwards 83

The Biology of Paternal Care in Human and Nonhuman Primates
Eduardo Fernandez-Duque, Claudia R. Valeggia, and Sally P. Mendoza 115

Developmental Origins of Adult Function and Health: Evolutionary Hypotheses
Christopher W. Kuzawa and Elizabeth A. Quinn 131

Interdisciplinary Translational Research in Anthropology, Nutrition, and Public Health
Stephen T. McGarvey 233

Linguistics and Communicative Practices

New Paths in the Linguistic Anthropology of Oceania
Matt Tomlinson and Miki Makihara 17

Social Reproduction in Classrooms and Schools
James Collins 33

Medical Discourse
James M. Wilce 199

International Anthropology and Regional Studies

The Ethnography of South Asian Foragers
Jana Fortier 99

Sociocultural Anthropology

The Commodification of Intimacy: Marriage, Sex, and Reproductive Labor
Nicole Constable 49

Adoption of the Unrelated Child: Some Challenges to the Anthropological Study of Kinship
Signe Howell 149

Anthropology and Global Health
Craig R. Janes and Kitty K. Corbett 167

Transitions: Pastoralists Living with Change
Kathleen A. Galvin 185

Symptom: Subjectivities, Social Ills, Technologies
João Biehl and Amy Moran-Thomas 267

Theme 1: Current Research on Gender

The Commodification of Intimacy: Marriage, Sex, and Reproductive Labor
Nicole Constable 49

Identity and Difference: Complicating Gender in Archaeology
Pamela L. Geller 65

The Early Development of Gender Differences
Matthew H. McIntyre and Carolyn Pope Edwards 83

The Biology of Paternal Care in Human and Nonhuman Primates
Eduardo Fernandez-Duque, Claudia R. Valeggia, and Sally P. Mendoza 115

Theme 2: Anthropology and Human Health

Developmental Origins of Adult Function and Health: Evolutionary Hypotheses
Christopher W. Kuzawa and Elizabeth A. Quinn 131

Anthropology and Global Health
Craig R. Janes and Kitty K. Corbett 167

Medical Discourse
James M. Wilce 199

Interdisciplinary Translational Research in Anthropology, Nutrition, and Public Health
Stephen T. McGarvey 233

Symptom: Subjectivities, Social Ills, Technologies
João Biehl and Amy Moran-Thomas 267

Indexes

Cumulative Index of Contributing Authors, Volumes 29–38 307

Cumulative Index of Chapter Titles, Volume 29–38 310

Errata

An online log of corrections to *Annual Review of Anthropology* articles may be found at http://anthro.annualreviews.org/errata.shtml