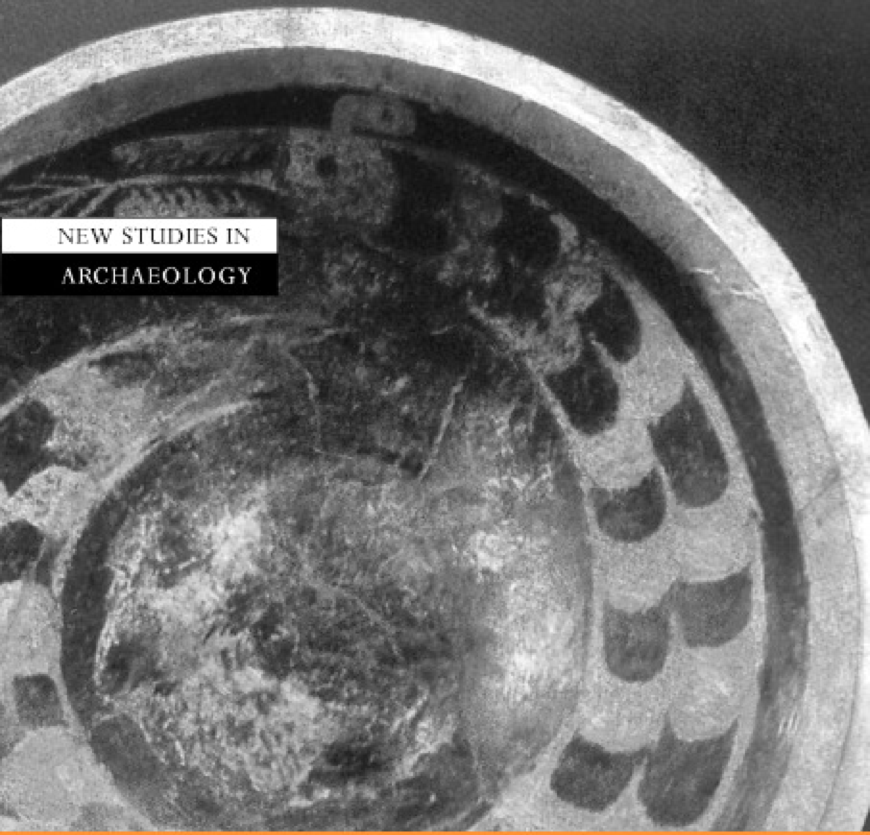

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LI LIU

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The Chinese Neolithic

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LI LIU is Senior Lecturer in Archaeology at La Trobe University. She has published various articles on the Chinese Neolithic and is the author of *State Formation in Early China* (with Xingcan Chen) (2003).

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LI LIU

The Chinese Neolithic

Trajectories to Early States

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Dedicated to
my parents, my sisters, and Tom and Vicky

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PREFACE

Chinese archaeology is a fast-growing field of study, and new information is accumulating rapidly. Such a tremendous volume of data can provide insights for our understanding of social evolution in world history. However, because of the language barrier and methodological and theoretical differences between Chinese and Western archaeologists, the Chinese data have not been so widely accessible as data from other parts of the world. Much effort has been made by archaeologists in recent years to bridge the gap between Chinese specialists and international readers, and this book is also an endeavour of this kind.

This book is based on my Ph.D. dissertation research on settlement patterns of the Longshan culture, completed in 1994, and the contents of chapters 5 and 6 were partially published in 1996. However, a large part of the book presents new data and analysis, which is the result of my research in recent years.

I would like to first express my greatest appreciation to my dissertation advisors: Kwang-chih Chang, Richard Meadow, and Rosemary Joyce of the Anthropology Department at Harvard University, who gave me tremendous help and encouragement, not only during the course of writing the thesis but also throughout the years I was studying at Harvard. I am especially grateful to the late Professor K. C. Chang, whose advice and help at every step of my academic life have been extremely valuable in many ways.

I would like to use this opportunity to express my gratitude to Thomas Patterson, Peter Rigby, and Anthony Ranere at Temple University in Philadelphia, where I spent the first four years of my graduate study in the United States. Stimulated by their unstinting help in matters from language to ideas, I began the study of anthropological archaeology. Without their patience and support I would have not been able to take the first step in the long journey of my academic career in this field.

Generous institutional support from La Trobe University, where I have been teaching Chinese archaeology for the past eight years, has enabled me to complete this book. I would like to thank especially Vice-Chancellor Michael Osborne, and Head of School Tim Murray, for their consistent support.

I am extremely grateful to many archaeologists in China. Among countless names, my Chinese colleagues in the Shaanxi Institute of Archaeology were very supportive of my excavation project, which contributed to my dissertation research. In recent years I have worked on several projects with Chen Xingcan of the Institute of Archaeology at the Chinese Academy of Social Sciences. I benefited most from our collaborative research projects on the procurement of salt and copper resources in early Bronze Age China, and on regional settlement patterns in the Yiluo region (jointly conducted by Lee Yun Kuen, Henry Wright, and Arlene Rosen), which dramatically improved my understanding of social processes in early China. Constant exchanges of ideas on many issues with Chen Xingcan, Li Xinwei, and Ma Xiaolin in recent years have also given me intellectual inspiration to form the new interpretations presented in this book.

During the nine years of revising the book, I have received much encouragement and help from many individuals. David Keightley, Henry Wright, Arlene Rosen, David Frankle, and the Series Editor, John O'Shea, provided many critical and constructive comments. Jing Zhichun, Tang Jihen, and Lee Yun Kuen allowed me to use the information from their unpublished papers.

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Finally, I am grateful to my parents who highly value intellectual work. Their influence throughout my entire life has always encouraged me to pursue ever-higher levels of scholarly accomplishment.

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1

Setting the scene

> The objective of modern Chinese archaeology is to construct national history.
>
> Su Bingqi (1997: 4)

There is no need to emphasize the significance of Chinese civilization, which produced one of the few pristine states in the world nearly four thousand year ago. But it is rather surprising to note that, compared to other civilizations, little has been done in Chinese archaeology to systematically study the processes of state development. The aim of this book is to reveal the trajectories through which Neolithic culture developed from simple villages to complex political entities in the middle and lower Yellow River valley, the region in which the first Chinese states evolved. The most crucial time period for understanding these processes is the eve of the emergence of states, when the Longshan culture flourished.

The Longshan culture of Neolithic China was distributed through the middle and lower Yellow River valley in the third millennium BC. As the platform for fundamental social change it anticipated the emergence of early Chinese states and civilizations, the Xia, Shang, and Zhou dynasties. Several cultural traits mark a new stage of social development in the Longshan period. Writing systems may have been practiced (Chang 1999: 64–65; Postgate *et al.* 1995: 467–468); copper and bronze were used for making small implements and ornaments (Linduff *et al.* 2000); town walls were built and violence and warfare were widespread (Liu, L. 2000b; Underhill 1989, 1994); burial configurations indicate the presence of social hierarchies (Fung 2000; Liu, L. 1996a; Pearson 1981; Underhill 2000); regional cultures became more extensively distributed and interaction between them intensified; and finally, the Neolithic cultures of this region became increasingly complex, forming the foundation for the development of civilizations (Chang 1986: 234). Because of its crucial temporal and spatial situation, the Longshan culture has been a major focus in the study of early Chinese civilizations. Without understanding the social organization and transformations of the Longshan culture, we simply cannot conduct any meaningful study on the emergence of early states in ancient China.

Constructing the Longshan culture in archaeology

The Longshan culture is one of the Neolithic ceramic assemblages identified by the pioneers of modern Chinese archaeology early this century. It was named after the site found at Longshan in Licheng, Shandong, by Wu Jinding (Wu 1930) in 1928. Since that time views of this culture have continuously changed as new archaeological data have become available. In particular, the term "culture" here refers to a distinctive material assemblage, and the changing interpretations of the Longshan culture have been heavily influenced by the ongoing recognition of new ceramic types.

At first, the Longshan culture, mainly characterized by black pottery, was thought to have arisen in the Shandong region independently of the Yangshao culture – the painted pottery tradition found in north and northwest China. It was believed to have contributed to the foundation for the Shang civilization (Li Chi 1934). By the end of the 1930s, archaeologists had found more than seventy Longshan sites in a broad region including the Shandong, northern Henan, and Hangzhou Bay areas. Archaeologists also began to notice regional variation of pottery forms, and then concluded that only the Longshan culture in the northern Henan region was the direct forerunner of the Shang civilization (Liang 1939).

After the 1940s, more sites containing black pottery were found over an even broader area ranging from Taiwan and Fujian in the south to Liaoning and Hebei in the north. Archaeologists then argued that the Longshan culture was centered in the Yellow River valley, with variations of this mainstream culture in surrounding areas (An 1959, 1979).

Some archaeologists in the West also held this core-periphery view of the Longshan culture. Chang (1959) proposed the concept of a "Longshanoid horizon" to characterize the many similarities in stone and ceramic modes and phases that occurred throughout eastern coastal China during a limited period of time. He suggested that the Longshanoid horizon reflected cultural expansion from a single nuclear area, the Central Plains, which traditionally has been regarded as the cradle of Chinese civilization. This interpretation seemed to fit this intellectual tradition, as well as the available archaeological data, which showed a complete sequence of Neolithic development in the Central Plains, but not in other areas.

By the early 1960s, the sequences from Miaodigou in Shanxian (Institute of Archaeology 1959a) and Wangwan in Luoyang, Henan (Peking University 1961) showed that the Longshan was chronologically later than the Yangshao culture, rather than contemporary with it as originally thought. The stratigraphy and ceramics indicated that the Yangshao culture developed into the Longshan culture through an intermediate phase. At the same time, sites in the Hangzhou Bay area, which had been included in the Longshan culture by Liang (1939), came to be regarded as separate from it and were identified as the Liangzhu culture, since they manifested rather distinctive regional traits (Institute of Archaeology 1959b: 31).

By the 1970s, researchers had come to recognize that the "Longshan culture" of different regions derived from different cultural contexts (An 1972). For example, in the Shandong region it was derived from the Dawenkou culture (Shandong Museum 1976); while in the western Henan and southern Shanxi regions it developed from the Yangshao culture through a intermediate phase, the Miaodigou II (or early Longshan) culture (Institute of Archaeology 1959a; Zhang Daihai *et al.* 1984).

Continuing archaeological discoveries have suggested that, although Longshan cultures in different regions seem to share some common traits, they represent distinct local sequences and traditions. Therefore, in the early 1980s, Yan (1981) proposed that the regional variants of Longshan culture should be regarded as separate cultures. At the same time he also proposed the term "Longshan period" as a name for the time when these cultures flourished.

At present, both "Longshan period" and "Longshan cultures" are used in the archaeological literature. The concept of a "Longshanoid horizon," accordingly, simply refers to as "a spatial integrating device crosscutting a number of regional sequences" which "began in the north and the Yangtze valley by the middle of the fourth millennium BC and continued along the eastern coast all the way to Taiwan and the Pearl River delta up to the middle of the third millennium BC" (Chang 1986: 238).

As the early discoveries of major Longshan sites were made in different regions, the local cultures they represented were named after the modern provinces. For example, the Longshan culture found in the Shandong region (also called the Typical Longshan culture to emphasize its originality) was referred to as the Shandong Longshan culture; the Hougang II culture found in northern Henan became known as the Henan Longshan culture; and the Keshengzhuang II culture found in central Shaanxi was called the Shaanxi Longshan culture (An 1981: 255). Archaeologists soon recognized that these major sites cannot fully represent the cultural variations in each provincial region, that the regional Longshan cultures should be further classified into several sub-divisions based on ceramics, and that this classification often cross-cuts modern provincial boundaries. Figure 1.1 and Table 1.1 illustrate

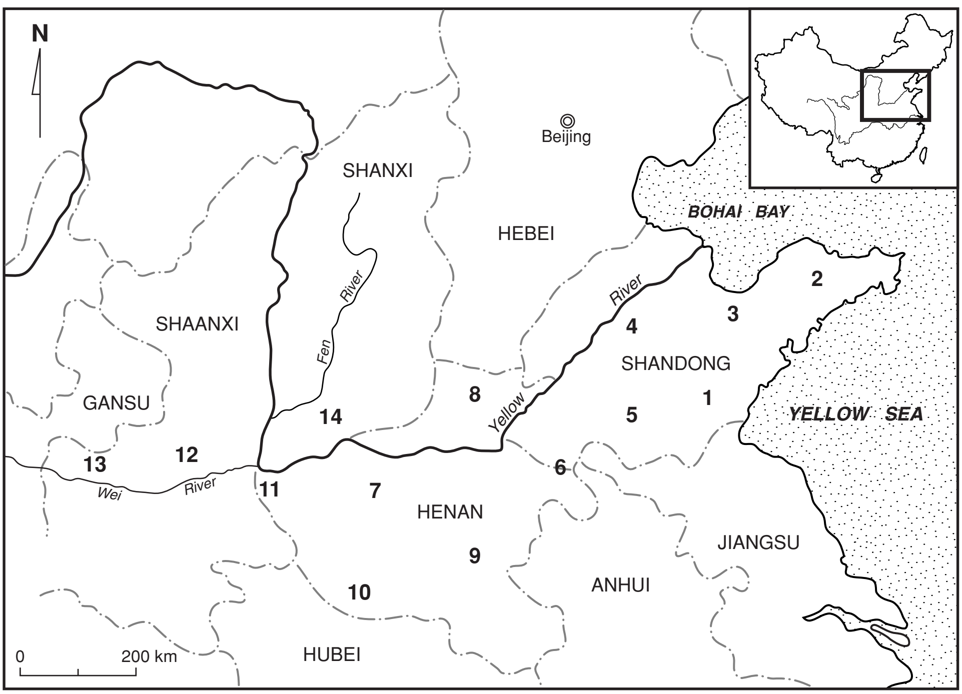


Figure 1.1 Map of the middle and lower Yellow River valley showing the distribution of the major variants of the Longshan culture. 1: Liangcheng; 2: Jiaodong; 3: Yaoguanzhuang; 4: Chengziyai; 5: Yinjiacheng; 6: Wangyoufang; 7: Wangwan; 8: Hougang; 9: Haojiatai; 10: Xiawanggang; 11: Sanliqiao; 12: Keshengzhuang; 13: Shuang'an; 14: Taosi.

Table 1.1 *Chronology of the major regional archaeological cultures discussed in the text*

	U. Yellow R.	M. & L. Yellow R. and Huai R.				M. & L. Yangzi R.	
BC	Gansu	Shaanxi	Shanxi	Henan	Shandong	Hubei	Jiangsu
1100 1500	Regional Bronze cultures	Shang & Proto-Zhou		Shang		Shang & regional Bronze cultures	
2000	Qijia Machang Banshan	Erlitou & regional cultures	Erlitou & regional cultures	Erlitou & Xiaqiyuan	Yueshi	Erlitou & regional cultures	
2500	Majiayao	Late Longshan			Dawenkou	Shijiahe	Liangzhu
3000		Early Longshan				Qujialing	
	Yangshao	Yangshao			Beixin	Daxi	Majiabang
5000							Hemudu
6500	Dadiwan I	Laoguantai		Peiligang	Houli	Chengbeixi	Kuahuqiao
7000							

the distribution of the fourteen spatial and chorological divisions of the Longshan culture.[1] In this book, I use either "Longshan culture" or "Longshan period" as required by the specific contextual need for clear description of data. Although the social implications of regional ceramic types are unclear, nevertheless, for convenience, I use terms such as "Henan Longshan" or "Shandong Longshan" to indicate the spatial distribution of the Longshan sites in question.

Longshan culture and constructing national history

In general there is a marked difference in research focus between Western anthropological archaeology, especially in America, and archaeology in East Asia, including China. As described by Ikawa-Smith (1999: 626), "East Asian archaeology is national history or it is nothing" would be an overstatement, but it is not too far from the reality.

The formation of the discipline in the first few decades, from the 1920s to 1940s, was stimulated by scientific methods and nationalist principles in order to reconstruct an indigenous national history. Its recent development in the past fifty years has been a continuation of reconstructing cultural history, with strong influence partly from the Morgan-Engels schematic evolutionary doctrines favored by Marxists, and partly from changing concepts of nationalism. The discovery and ongoing study of the Longshan culture have constituted an important component in this trend.

The discovery of Longshan culture and nationalism

The nationalist movement in modern Chinese history has played a crucial role in the development of Chinese archaeology. Excavation of the first major Longshan site at Chengziyai, in fact, was a product of nationalist endeavor.

Modern archaeological methods were introduced into China first by foreigners when J. G. Andersson (Swedish) started excavation of a Neolithic site at Yangshao in 1921, E. Licent (French) and Teilhard de Chardin (French) began to survey Paleolithic sites in the Ordos region in 1922–1923, and B. Bohlin (Swedish) initiated large-scale excavations at Zhoukoudian in 1927 (Chen 1997: 87–113). The scientific methods used by the Western scholars were enlightening to Chinese scholars, who were, however, dissatisfied with the general orientation of the research. These Paleolithic and Neolithic remains were thought to be too remote to be connected directly to early Chinese history (Li Chi [1968] 1990), especially the Three Dynasties. Andersson's proposal, that the origins of the Yangshao culture might be traced to the Near East (Andersson 1923), was even less appealing. As Fu Sinian (1934) complained, "the foreign archaeologists in China do not pay any attention to the material which represents indigenous Chinese culture, but are only interested in the remains which indicate cultural connections between China and the West."

It was at this time that a group of Chinese scholars, who received training in modern archaeology from Western universities, returned to their homeland with high nationalist fervor. The first was Li Chi, who, with others, launched a series of archaeological research projects beginning in 1926. There were three well-planned major archaeological expeditions which were joined or conducted by the first generation of Chinese archaeologists before the 1950s: the excavations (1) of *Homo erectus* remains at Zhoukoudian, near Beijing; (2) of the Shang capital city, Yinxu, in Anyang, Henan, and (3) of the Neolithic culture at Chengziyai in Shandong. While the first project was viewed as rather irrelevant to the Chinese national identity at the time, the choice of locations for the last two projects was clearly motivated by the search for indigenous Chinese cultural origins.

Under the leadership of Li Chi, the excavations in Anyang from 1928 to 1937 yielded numerous material remains, including hundreds of bronze objects, nearly 25,000 pieces of inscribed oracle bones, bronze workshops, palace/temple foundations, and large royal tombs. These finds not only proved the site to be a capital city of the late Shang dynasty, but also connected the Shang to more indigenous culture origins. As Li Chi (1954) summarized it, in addition to the style of inscriptions, there are three typically Chinese cultural elements: divination with fire-cracked bones, silk cultivation, and a certain decorative style, all of which originated in China.

Although excavations in Anyang for the first time confirmed archaeologically the existence of indigenous ancient Chinese culture, however, because there was a gap between the Chinese material cultures of the historical Shang dynasty and the Neolithic Yangshao, the latter was then regarded as somewhat of a cultural diffusion from the Near East. Chinese scholars were still dissatisfied with the general notion that pre-dynastic cultures in China were derived of ripples extending from the West. Fu Sinian (1934) objected that the study of Chinese history by foreigners was mainly focused on Sino-foreign relationships, which was only a "semi-Chinese" (*ban Han*) endeavor. However, he continued, the more important issues to be studied were those "completely Chinese" (*quan Han*), that is, concerned with building the basic structure of Chinese history.

The cultural disconnection between Yangshao and Anyang urged archaeologists to search for a direct progenitor of the Shang, and the general consensus among archaeologists and historians was that the most likely area was in eastern China. After work at Anyang was halted around 1930 due to war, the excavation team later moved its operations to Chengziyai in Longshan township, Shandong, after Wu Jinding's preliminary surveys had revealed promising discoveries there (Fu 1934; Li Chi 1934).

The excavations at Chengziyai were more fruitful than the excavators had expected. Distinctive from the Yangshao painted pottery, the black pottery from Chengziyai was similar to the Neolithic remains found at Hougang in Anyang, which were directly superpositioned by the Shang cultural remains. Uninscribed oracle bones found at Chengziyai provided an even more direct link between the Longshan and Shang, since it was the inscribed oracle bones which ultimately distinguished ancient Chinese culture from other parts of the world. The Longshan culture of black pottery in the east (representing indigenous Chinese culture) was thus viewed as a system independent from the Yangshao culture of painted pottery in the west (thought to be foreign diffusion). It became hopeful that "if we can trace back the distribution and development of the black pottery culture represented by Chengziyai, most problems in the formative period of Chinese history would be resolved (Li

Chi 1934: xvi)" (author's translation). Therefore, as Li Chi (1934: xiv) pointed out, this discovery not only found a homeland for a part of the Shang culture, but also enlightened our knowledge about the origins of Chinese civilization.

For decades, archaeologists struggled to achieve two missions: to defend their belief in the indigenous origins of Chinese culture against foreign diffusionism, on the one hand; and to reconstruct a reliable cultural history based on material remains, in order to clear up uncertainties in textual records which had been attacked by historical revisionists known as *yigupai*, Doubters of Antiquity (Schneider 1971), on the other hand. These objectives, in turn, determined the nature of archaeology as an enterprise closely aligned with the racial/ethnic nationalism of the Han Chinese. Not until after the 1950s, under the reign of communism, did multi-ethnic nationalism begin to affect archaeology, which shifted from emphasis on the *Zhongyuan* (Central Plains) to focus on multi-regional development (for more discussion see Liu, L. and Chen 2001a).

Longshan culture and a changing view of national history

The changed view of national history in archaeology, from a *Zhongyuan*-centered tradition to a multi-centered parallel development, was not simply a product of political propaganda, and did not happen overnight. It has gradually emerged and become crystalized in the last twenty years, resulting from a complex interplay of several factors. These include voluminous new archaeological discoveries made in areas outside the Central Plain which was traditionally regarded as the core area of Chinese civilization, the recognition of diversified regional cultural traditions based on these new findings, increasing confidence in the credibility of textual records, and a changing view of nationalism in recent years.

Multi-regional development in archaeology: the *quxi leixing* model

Rapidly growing results of archaeological fieldwork in the past fifty years have produced a very large database, which allows archaeologists to generate various research strategies. Initiated by Su Bingqi, a research model known as *quxi leixing* "regional systems and local cultural series" was proposed more than twenty years ago (Su and Yin 1981; Wang, T. 1997). It is based mainly on ceramic assemblages, with an emphasis on independent development of, and interaction between, different regional cultural traditions. The *quxi leixing* concept was intended to provide a methodological framework for the reconstruction of Chinese prehistory, as it shifted away from the center-periphery model to a multi-regional approach to the development of Chinese civilization (for the historical background of this trend see Falkenhausen 1995; Wang, T. 1997). As stated by Su Bingqi (1991), after 10,000 BP six relatively stable regional divisions (*quxi*) had formed within the area embraced by historical China: (1) the Northern region centered in the Yan Mountains and the Great Wall area; (2) the Eastern region centered in Shandong; (3) the Central Plains, an area generally including central Shaanxi, southern Shanxi, and western Henan; (4) the Southeastern region around the Lake Tai area; (5) the Southwestern region including the Lake Dongting area and the Sichuan Basin; and (6) the Southern region including an area from Lake Poyang to the Pearl River delta. The six regional cultures are further divided into a number of local phases (*leixing*). Each of these regions, according to Su, had its own cultural origins and developments, and interacted with the others in the developmental processes of Chinese civilization.

Yan Wenming suggested a similar model to articulate "the unity and variability of Chinese prehistoric culture," seeing the Central Plains as the center of the flower and cultural traditions in the surrounding areas as the layers of petals (Yan 1987). Instead of giving equal weight to all regional cultures implied in Su's hypothesis, Yan's model emphasizes the leading role of the Central Plains in the processes toward civilization, while acknowledging the existence of elements of civilization in the peripheries in prehistory. However, this somewhat compromised approach to cultural diversity seems to have been overshadowed by Su Bingqi's radical model.

Although the *quxi leixing* concept has not been accepted by all Chinese archaeologists due to its vagueness in both theory and application (An 1993a), it has exerted a strong influence in the discipline. The construction of a fixed framework defining archaeological prehistory has become a goal pursued by many archaeologists. The ceramic typologies which form the material basis for the *quxi leixing* concept, therefore, have played the most important role in this endeavor. As a result, classifying archaeological cultures and phases in ever more elaborate detail has become a major task for many Chinese archaeologists.

New concepts of nationalism and archaeology From a broader political background, the concept of nationalism has also changed through time, as both the Nationalist and Communist governments have attempted to bring China's multi-ethnic population into a coherent and viable political unit. After the 1950s, the concept of nation in China became equivalent to that of the state, best described by Fei Xiaotong (1989) as *duoyuan yiti* (single entity with multiple components). Fei argues that China, as an actual ethnic entity without self-awareness of its coherent national identity, has gradually come to existence through thousands of years. This formative process was amalgamative, with a dominant core constituted by the Huaxia, and then by the Han people. However, the cultural interaction between the Huaxia-Han and other ethnic groups was not a one-way diffusion, but mutual influence. This multiple national entity now, according to Fei, includes all constituent ethnicities (more than fifty) and covers the entire territory of modern China. It seems that this new concept of nationalism fits relatively well with the archaeological paradigm proposed by Su Bingqi. It is not clear whether Su and Fei reached their similar conclusions spontaneously, or one influenced the other. Evidently the *quxi leixing* concept in archaeology and the *duoyuan yiti* paradigm in sociology mutually support each other in constructing the national history.

A state-directed project in the 1990s pushed the task of national-history building to its peak. During his visit to Egypt, Song Jian, the State Counselor (*guowu weiyuan*), was introduced to a detailed chronological record of dynastic Egypt which started from 3100 BC. Dissatisfied with the Chinese dynastic chronology which not only begins a thousand years later but is also less precise than that of Egypt, Song Jian called for a project to reconstruct an accurate chronology of the Three Dynasties, so that Chinese civilization would be comparable to that in Egypt (Song 1996). This project, known as the Xia Shang Zhou Chronology Project, was officially launched in 1996. For nearly four years, more than 200 experts in history, archaeology, astronomy, and radiocarbon-dating technology were involved in the project, focusing on nine primary research topics, which were further divided into forty-four sub-topics. A budget of about 17 million yuan (US$ 2.1 million) was directed to the project. Archaeology certainly benefited from such a generous financial commitment from the state, which supported some major excavations. By 1999 the project achieved its major objectives in reconstructing the time frame of the earliest dynasties dating back to 2000 BC (Xia Shang Zhou 2000). This project has generated much criticism from both China and the West, regarding its methodological problems, political motivations (Jiang 2002; Lee 2002), as well as some idiosyncratic matters (Liu Qiyu 2003: 847–850). There is no question that the chronology of the Three Dynasties has apparently become more detailed than before; however, the project has not made Chinese civilization temporally comparable with some older civilizations in other parts of the world. A new research organization, the "Center for the Study of Civilization" was established in 1999 under the Department of Archaeology at Peking University (Centre for the Study of Ancient Civilization 1999). Encouraged by the achievement made in the Three Dynasties Project, archaeologists are now determined to find the ultimate origins of Chinese civilization, which ought to be embedded in the Neolithic cultures. The Longshan culture thus has become the focus of this new pursuit (Li Boqian 2001).

Longshan culture in legendary history

It should be pointed out that the application of the *quxi leixing* model is not limited to ceramic classifications, nor is nationalism employed purely as political propaganda. With increased knowledge about regional archaeological cultures, scholars have developed a strong willingness to construct cultural history based on archaeological material remains and the historical record. There has been a tendency to identify archaeological cultures and phases, or even sites and artifacts, directly with specific ancient groups of people named in legends or historical literature. For example, some scholars have argued that the Henan Longshan culture may have been the Proto-Xia, the group that gave rise to China's earliest recorded dynasty (Tian 1981); the Taosi variant in south Shaanxi may have been related to the Taotang clan (Wang Wenqing 1987); and the spread of ceramic vessels, *jue* and *he*, represents the historically documented development and migration of the Xia and Shang peoples (Du 1990, 1992a). By this means, archaeological assemblages (mainly pottery typology) become historically meaningful, although the logical connections between the two sets of information have not been made explicit.

In recent years, some terms taken from ancient Chinese legends have become favored in discussions of the Longshan culture, such as *Wudi shidai*, the Five Emperors period (Yan 1992). This refers to the legendary heroes and sages who ruled before the Xia dynasty, and the time period was characterized by the coexistence of "ten thousand states," each possibly composed of a walled town and some villages (Chang 1999: 68–71; Yan 1997: 51). This situation seems to match recent archaeological discoveries in the Longshan culture, which have revealed a number of walled towns (Yan 1997; Zhang Xuechai 1996b).

Because the term "Five Emperors" comes from Chinese tradition, it seems to be a more authentic description of the archaeologically demonstrated culture than foreign terms like "chiefdom" (Yan 1997: 51–52). However, the Five Emperors were possibly not historical personages (for a discussion and some references to this subject, see Chang 1983a: 2), and it is impossible to ascertain their chronology. Although these interpretations make archaeology more relevant to the construction of national history, the two classes of data (legends and archaeology) are not directly comparable. Each of them must be critically studied in its own terms with methods appropriate to each form of information. Only at the end, once the documentary and archaeological records have been independently worked out, can they be considered together.

Evolutionary approaches to the study of Longshan culture

Archaeologists in the West have gone through a series of changes regarding cultural evolution, from the emergence of classic evolutionary paradigms in the nineteenth century (e.g., Engels [1884] 1972; Morgan [1877] 1963), to a strong reaction against this approach in the first decades of the twentieth century (Harris 1968; Wissler 1914), to the enthusiasm for neo-evolutionary models in the 1950s to 1970s (e.g., Fried 1960; Morton 1967; Sahlins 1958; Service 1962, 1975), followed by dissatisfaction with, modification of, and increasingly controversial debate over, evolutionary approaches since the late 1970s (e.g., Blanton *et al.* 1996; Blanton *et al.* 1981; Earle 1977, 1978, 1991a; Feinman and Neitzel 1984; Helms 1979; Wright 1984; Yoffee 1993). In Chinese archaeology the picture is rather different.

Evolutionary models in Chinese archaeology

Up to twenty years ago the only theoretical thinking concerning cultural evolution in Chinese archaeology was dominated for decades by the Chinese version of Marxism. This has led to a basic theoretical weakness in the preference for a unilineal perspective of social evolution (Tong Enzheng 1995). Following the Morgan-Engels theory (Morgan [1877] 1963; Engels [1884] 1972), many Chinese archaeologists have believed that all primitive societies progressed from a matrilocal/matrilineal/matriarchal clan organization to a patrilocal/patrilineal/patriarchal society, and that this corresponded to the transition from an egalitarian society to a stratified society. This transition is thought to have been a result of differentiation in the means of economic production. According to this theory, the development of the means of production, especially metal implements, promoted the divergence of crafts from agriculture. This division of labor formed a fundamental condition for the accumulation of surplus and commodity exchange. As a result, stratification emerged in clans. Then cities, craft centers, and commercial centers were developed, and a class society based on private ownership and exploitation was established (Shi Xingbang 1983: 37). This evolutionary scheme has been implanted in the minds of several generations of scholars through education, and its applications have been widespread in studies of Chinese archaeology and history.

This theoretical framework, however, has been contradicted by recent studies. For example, the evidence for a matrilineal/matriarchal society in Neolithic China is vague (Wang Ningsheng 1987), and results of recent osteological study (Gao and Lee 1993) and mitochondrial DNA analysis (Jilin University 2001) on skeletal remains from Neolithic cemeteries in Shaanxi and Hebei, dating to the middle and late Yangshao periods respectively, do not support the previously proposed matrilineal or matrilocal burial pattern. Also, there are few examples of metal implements used for subsistence production during the Longshan period or even during the Bronze Age (Chang 1980: 223–30).

Influenced by the Morgan-Engels evolutionary framework, Chinese archaeologists adopted various terms to define the nature of Longshan culture and society. Some borrowed the nomenclature used by Morgan and Engels, employing terms such as the "patrilineal clan" period (Shi Xingbang 1983), "patriarchal" society (Tian 1987), and "military democratic" period (Li Yangsong 1984). The first two terms, as discussed above, are based on a misguided preconception that there was a sequential development of kinship organization from matrilineal to patrilineal in ancient societies worldwide. While there is much evidence of military activity in the Longshan period, it is simply not possible to identify political structures of that time as "democratic."

It is notable that in recent years Marxist doctrine has been gradually fading away in archaeological literature. Instead, growing attention has been placed on the archaeological reinterpretation of textual accounts and on historical construction based on the archaeological record. Nevertheless, as an official theoretical guideline, the principles of the Morgan-Engels evolutionary model have been amalgamated with the new concept of nationalism and its applications in archaeology, together forming the core components in the reconstruction of national history (e.g., Li Xueqin 1998).

The neo-evolutionary model (band-tribe-chiefdom-state) proposed by Elman Service (1962) was first briefly introduced to China in the 1980s (Chang 1983c: 49–52; Tong 1989). Although this theoretical framework gained some support from Chinese scholars after its belated introduction (e.g., Chen 1998; Xie Weiyang 1996), it has not been widely adopted. Still less awareness has been given to the deficiencies in this approach. Many people are still comfortable with the classic evolutionary framework. Even among scholars who attempt to adopt the term *qiubang* (chiefdom), there is a certain degree of confusion surrounding the concept. The interpretations of Neolithic social organization are, in many cases, largely based on the combination between ancient texts, which were written hundreds or thousands of years after the Longshan period, and poorly digested classic evolutionary doctrines.

Constructing a cultural-social evolutionary scheme for China

Dissatisfied with those borrowed Western concepts, some Chinese archaeologists have begun to search for new frameworks with indigenous characteristics, in order to constitute a Chinese-style archaeology (Su 1997). A new concept, *gucheng guguo* *guwenhua shidai* (the period of archaic towns, archaic states, and archaic culture), has gained recent popularity. This concept, which equates three loosely related phenomena, was first proposed by Su Bingqi (1986) in the 1980s, and then was widely adopted by many others. According to Su (1986: 42), "*gucheng* (archaic town) refers to the earliest type of towns which became separated from ordinary villages but had not yet developed into cities; *guguo* (archaic state) means a stable and independent political entity that transcends a clan-based tribe." These two concepts were incorporated later into the first part of an evolutionary trilogy, *guguo – fangguo – diguo* (archaic state – regional state – empire) also proposed by Su. The *guguo* period, described as equivalent to *chengbang* (city-states), is believed to have first started in the Hongshan culture more than 5000 years ago in northeastern China, and then spread to other regions including the Longshan culture in China. The *fangguo* period, representing a mature type of state society, is thought to have begun in some prehistoric cultures (Liangzhu in the Yangzi River valley and Lower Xiajiadian in northern China) and later to have characterized the Three Dynasties. The *diguo* period started in the historical Warring States era when some major regional states launched military competition for political domination (Su 1997: 107–139). Apparently, these descriptions lack conceptual explanations and logical criteria for defining states. These confusions generated other problems in the construction of Chinese-style archaeological theories.

Another research strategy, which has resulted from the emphasis on regional cultural development (*quxi-leixing*), is to trace the origins of civilization in each region to an earlier time than was traditionally thought. Much effort has been made either to link certain cultural achievements, such as the manufacture of jade objects and the construction of large ceremonial monuments, with the dawn of civilization (e.g., Su 1988, 1997), or to connect the regional Neolithic cultural developments with the activities of legendary kings and sages (e.g., Xu Shunzhan 1996, 1997). As a consequence, not only could the origins of Chinese civilization be pushed back by a thousand years or more to match its counterparts in Mesopotamia and Egypt (Su 1988, 1997: 110), but also the birthplace of the Xia dynasty could be identified in many locations from north (An 1996; Zhang Zhiheng 1996) to south (Chen Shengyong 1991) over China.

These conclusions, however, suffer from a major deficiency – the conceptual confusion between civilization and state. That is not surprising, since the two terms have long been used interchangeably not only in Chinese but also in Western archaeological literature. Only in recent years have the distinctive implications of the two concepts been emphasized – while *civilization* refers to a great cultural tradition (containing such features as a refined art style, a specialized architecture, or writing and a calendar), *state* represents a form of political organization (Cowgill 1988: 256; Service 1975: 8, 178; Yoffee 1991: 15). One can argue that the production of jade objects was a part of the great cultural tradition of ancient China, indicating the initiation of the Chinese civilization. However, one needs more evidence than the presence of a few jade objects and large burials to define a society as a state-level organization. It is not clear, in these cases, how and why certain material elements (such as ceramic and jade forms and motifs) were transported from one region to another, by what modes of activity items were manufactured and distributed, how the religious system was related to political structure, what socio-political variations existed in different regions, how social groups related with each other, what social and environmental dynamics may have triggered social changes, and how societies developed towards complexity. In this regard, neither the *quxi-leixing* approach nor the legendary accounts provide much constructive information for a systematic analysis of the development of social complexity in ancient China. Therefore, without understanding social processes in these ancient societies, it is meaningless to claim ever-earlier origins of civilization, except for nationalist propaganda.

Most recently, Yan Wenming (1997) has pointed out that the concept of chiefdom – defined by Earle (Earle 1991b: 1) as a polity that organizes centrally a regional population in the thousands with some degree of heritable social ranking and economic stratification – may be indeed suitable to characterize the level of social complexity of the Longshan culture. He argues that, nevertheless, it is better to describe the Chinese cultural evolution by indigenous terms. The developmental processes of Chinese civilization, according to Yan, can be categorized as three stages: (1) *guguo shidai* (the archaic state period) including the Longshan period, which is equivalent to chiefdoms and can be regarded as the dawn of the Chinese civilization; (2) *wangguo shidai* (the dynastic state period) representing the Three Dynasties, which was the formative and developmental period of the civilization; and (3) *diguo shidai* (the empire period) starting from the Qin dynasty to the end of the Qing dynasty, which forms the major body of the civilization. This model seems to be the most explicit interpretation of evolutionary process in ancient China.

It is understandable that traditional terminology is more likely to be accepted, since the discipline itself is deeply rooted in the traditional scholarship. Nevertheless, the problem is not simply the use of either foreign or indigenous terminology; more important are the approaches associated with the terminology.

Alternative research strategies

Chinese archaeology is very rich in cultural relics, and an important task is to interpret social processes associated with these material remains. Archaeological data should be collected and evaluated in a systematic way using empirical methods. This research process should not be dominated by any preconceptions derived from textual records, which necessarily represent the biased world-view of ancient historians, or by modern nationalist designations. Ancient textual documents certainly are invaluable references for archaeological interpretation, but are not to be used as blueprints for constructing national history or, especially, prehistory. Texts should be used with caution.

An anthropological approach may help us to understand social processes of the Longshan culture. Longshan societies clearly developed from egalitarian village societies, and some of them evolved into states. The most commonly used term in western archaeological literature to characterize this mode of social organization is chiefdom. The conceptual model of chiefdom originally proposed by Service (1962,

1975) and Sahlins (1958) has been criticized in recent years. Its deficiencies have been discussed by many scholars (e.g., Earle 1977, 1978; Ehrenreich *et al.* 1995; Feinman and Neitzel 1984; Hill 1977; Yoffee 1993). However, anthropologists have not been able to replace "chiefdom" with an alternative designation, which literally and conceptually characterizes the social formation intermediate to relatively egalitarian societies and clearly stratified states. In addition, the concept of chiefdom has changed significantly from its original definition, and more social variations have been incorporated in order to understand the societies observed to be generally at the level of chiefdom in their social development (Earle 1991b). For the purpose of this study, which is to bring regional research, based primarily on non-western archaeological data, into the cross-cultural theoretical mainstream, chiefdom is still the most appropriate term to employ (cf. Arnold and Gibson 1995: 2). My employing the concept of chiefdom in this study is not because it is the best theoretical approach in social archaeology, but because it is a better option than the available alternatives, as described above, to analyze and interpret a particular set of data from Neolithic China. Therefore, in the following chapters, I use the term "chiefdom" and "early complex society" to characterize the Longshan societies and examine the Longshan culture within a general theoretical framework derived from studies of chiefdoms in other parts of the world.

The term "chiefdom" is defined here, following Earle's words, as "a polity that organizes centrally a regional population in the thousands . . . [with which] some degree of heritable social ranking and economic stratification is characteristically associated (Earle 1991b: 1)." In addition, a chiefdom develops a centralized decision-making process; however, it is externally but not internally specialized (Wright 1977: 381). My intention in this study, however, is not simply to fit Chinese data into another Western theoretical model, but to evaluate data using a theoretical framework which would facilitate cross-cultural comparison of Chinese material.

There are different opinions among scholars about the first state to have developed in north China. Some Chinese archaeologists take clues from ancient texts which described many prehistoric polities as *guo*, meaning state, and prefer early dates for the emergence of civilization and states. Opinions for these dates vary, from the Yangshao culture when the first-known walled settlement was constructed (e.g., Xu Shunzhan 1997), or the Longshan culture when several groups of walled sites appeared and mortuary patterns became hierarchical (e.g., Sun and Yang 1994), to the Erlitou culture when the first urbanism developed and is associated with a well-defined palatial complex and craft specialization (e.g., Chang 1986: 295; Li Boqian 1995). On the contrary, many Western scholars are cautious, believing that a state did not develop until the Shang dynasty, when characteristics of bureaucratic states are clearly observable in archaeological records (e.g., Bagley 1999; Keightley 1983, 1999; 2000: 56; Railey 1999: 178–196; Thorp 1991). These views manifest two general tendencies between Chinese and Western scholars regarding ancient textual materials. Many Chinese scholars tend to readily accept the accounts in ancient texts, calling for "departure from the era of doubting history" (Li Xueqin 1997b), while most Western Sinologists are especially critical of textual records, and disagree with the method commonly used by Chinese archaeologists, which matches archaeological findings to historical events mentioned in ancient documents.

These different views also reflect the lack of a standard definition for a state. In this book, a state is regarded as a society with minimally two class strata (a professional ruling class and a commoner class). Different from a chiefdom, a state has "a centralized decision-making process which is both externally specialized with regard to the local processes which 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 (Wright 1977: 383)." This book investigates the trajectories through which the political systems of early states arose, and also attempts to clarify the differences between prestate and state societies in the Yellow River valley.

Although a distinction between ranking (structural differentiation) and stratification (economic differentiation) has been made (Fried 1967), it is difficult to separate the political differentiation from economic control in many case studies (Earle 1987:290). In this research these two terms designate the two ends of a continuum situated between relatively egalitarian societies and bureaucratic states, in order to describe societies on the lower and higher levels of social complexity in the Chinese Neolithic period. Following Earle's definition, stratification is referred to as a situation in which a segment of society is distinguished by rank and status. Stratification is measurable archaeologically by identifying specific status markers in the contexts of ritual and economic subsistence (Earle 1987: 290–291). It is also noted that different political strategies used by elites in negotiating for power may lead to variability in economic control (Blanton *et al.* 1996; Renfrew 1974). Using data from China, this book explores the relationships between these two variables, to address the interplay of these factors that affected the formation of different trajectories to early states.

As discussed above, current methods employed in Chinese Neolithic archaeology are primarily based on ceramic typology, while the reconstruction of social processes relies heavily on textual material and some theoretical preconceptions borrowed from the West. There is a lack of middle-range methods, which can bridge the gap between the data and higher-level theoretical models. This book proposes an analytical approach to a systematic study of the Longshan culture, focusing on three basic social levels in settlement archaeology: household, community, and region.

Households are essential building blocks in the reconstruction of past societies, in terms of their role as measurable socio-economic units of the wider community, and as basic social groups articulating directly with ecological systems (e.g., Blanton 1994; Wilk and Rathje 1982a). Analysis of spatial relationships within sites, such as settlements and cemeteries, can reveal behavior patterns of certain social groups (Fletcher 1977). These patterns provide insights for understanding social, economic, and ritual activities in communities. The regional settlement pattern provides important general information about organizational complexity of polities, indicated by the number of different site types and their size and distribution over the landscape. The study of regional settlement patterns has been proved to be particularly fruitful in investigations of social processes in many regions of the world, including Mesopotamia (e.g., Adams 1965; Adams and Jones 1981; Wright and

Johnson 1975), Mesoamerica (e.g., Ashmore 1981; Blanton 1978; Feinman *et al.* 1985; Feinman and Nicholas 1990; Kowalewski 1989; Sanders *et al.* 1979), and South America (e.g., Drennan *et al.* 1991; Masuda *et al.* 1985; McAndrew *et al.* 1997; Willey 1953). In recent years this approach has also been employed in China, producing invaluable data for the study of regional variability of social development in ancient China (Liu, L. *et al.* 2002–2004; Sino-American Huan 1998; Underhill *et al.* 1998; Underhill *et al.* 2002).

This analytical strategy should enable us to view the social structure of Neolithic cultures from both synchronic and diachronic perspectives, that is, to identify not only the positions of these societies in the process of cultural–social evolution, but also the character of social activities and organization at micro and macro scales.

The scope of the book

This book covers a geographic region in the middle and lower Yellow River valley, mainly including Shandong, northern Jiangsu, Henan, southern Shanxi, southern Hebei, central Shaanxi, and eastern Gansu. The time span includes the Neolithic and Erlitou periods (ca. 7000–1500 BC), but the main focus is on the late Longshan period, dated roughly from 2600 BC to 2000 BC. This includes the Peiligang culture (ca. 7000/6500–5000 BC) in Henan; the Yangshao culture (ca. 5000–3000 BC) in Henan, Shanxi, and Shaanxi; the Dawenkou culture (ca. 4100–2600 BC) in Shandong and northern Jiangsu; the Qujialing culture (ca. 3000–2600 BC) in Hubei and southern Henan; the early Longshan period (Miaodigou II culture, ca. 3000/2800–2600/2500 BC) in Henan, Shanxi, and Shaanxi; the Erlitou culture (ca. 1900–1500 BC) and Xiaqiyuan culture (ca. 1800–1500 BC) in southern Shanxi, Henan, and southern Hebei; and Yueshi culture (ca. 1900–1500 BC) in Shandong and northern Jiangsu (Table 1.1). Chronologies for these cultures are determined on the basis of a large number of calibrated radiocarbon dates obtained from archaeological sites (Institute of Archaeology 1991).

The data used here are derived from three groups of sources: archaeological reports published in China during the past fifty years, my fieldwork at the Kangjia site in Shaanxi in the early 1990s, and results from systematic regional surveys conducted by Sino-foreign collaborative projects in recent years. Notably, there are several deficiencies involved in the first group of data. First, archaeological fieldwork and research have been carried out unevenly in different geographical areas, resulting in uneven availability of published information from these regions. Therefore, cross-regional analogy and comparison are employed, in order to overcome the insufficiency of data and to investigate general patterns of social development on a regional level. Second, Chinese archaeologists have largely focused on excavation of burials, and few sites have provided adequate information on both burial and residence in the Longshan culture. Third, most regional surveys in China have been conducted in unsystematic ways, and the results from these works need to be evaluated cautiously. As a consequence, a comparative analysis of burial and residential patterns from the same community cannot be conducted. Although the data contain many problems, the great quantity of available archaeological information is still an invaluable resource that enables us to conduct in-depth research on the subject. In addition, the third group of data, which have been recently collected with systematic methods, can be used to evaluate the non-systematic information.

In the following chapters, special emphasis is placed on several aspects, including environmental change, economic organization, political structure, religious systems, population parameters, and intra-regional and inter-regional interactions. These are investigated in relation to the development of social complexity in the Neolithic period.

Chapter 2 focuses on environmental conditions and archaeological sequences. Based on increasing amounts of data concerning relationships between environmental change and cultural change, revealed by geologists and archaeologists in recent years, this chapter is devoted to placing archaeologically demonstrable cultural development into an ecological context.

Chapter 3 is a study of residential patterns on the household level through the Neolithic period, focusing particularly on one residential unit of the Longshan culture, excavated at the Kangjia site in Shaanxi. By providing insights into economic and ritual activities indicated in some households, such as feasting and human sacrifice, this chapter prepares the way for further investigation of intra-settlement relationships at the community level.

Chapter 4 reveals the development of residential patterns on the community level. Settlement layouts from early Neolithic to the Longshan period are examined, in order to understand relationships between changes taking place in the spatial arrangement of settlements and transformations of social organization.

Chapter 5 discusses mortuary patterns on the community level. By analyzing quantitative and qualitative differences in grave furnishings and spatial relationships between the archaeological features in cemeteries, we are able to infer, to some degree, the social relations of the community, and to understand the role which ideology played in the developmental processes of social complexity.

Chapters 6 and 7 are devoted to a multi-variable analysis of regional settlement patterns over the entire study area. Site size, site density, settlement hierarchy, and rank-size distribution are informative variables for understanding settlement patterns in relation to social change on a macro scale. Special attention is paid to the inter-relationships among such factors as environmental conditions, climatic change, population movement, and human responses to internal and external challenges. These two chapters document the diversity of political formation among Longshan societies and the various processes through which early complex societies developed.

Chapter 8 investigates trajectories from prestate to state societies, by examining socio-political transformations that took place in different settlement systems. Social changes are attributable to multiple interrelated factors, both environmental and social. The first state (Erlitou) was characterized by population nucleation, centralized political and ritual control, development of craft specialization, and territorial expansion.

Chapter 9 offers a final discussion on theoretical implications of this research. The study of trajectories from chiefdoms to states in the Yellow River valley provides an opportunity to test and evaluate a number of theoretical propositions concerning cultural evolution.

In summary, this research demonstrates that an archaeological study of Neolithic China from an anthropological perspective with systematic analytical methods is extremely productive for our understanding of the formative period of Chinese national history and its place in world prehistory.

2

The changing environmental contexts of China’s first complex societies

> During the reign of Yao, the world was disorderly, and the land under the heaven was inundated by floods.
>
> “Tengwengong” in *Mencius*, a collection of the sayings of Mencius in the fourth century BC

The region of the middle and lower Yellow River valley is characterized by various geographic features, and has witnessed constant climatic and geomorphic change through time. These environmental conditions have in many ways affected economic adaptations and social organizations. Increasing temperature and humidity would have encouraged agricultural activities, mainly millet cultivation, spreading toward the north, and allowed a larger scale of rice cultivation in the Yellow River region. Decreasing rainfall and temperature, on the other hand, would have forced a return to millet, a southward retreat of the agricultural zone, and the development of pastoralism in the north. These environmental changes have had a major impact on the hydrology of river systems (Quine *et al.* 1999; Ren and Zhu 1994). In warm–moist climatic episodes the heavier vegetation cover would have stabilized the landscape, resulting in rivers with steady flow, a light sediment load, less alluvial build-up and soil formation. In colder–drier climatic episodes the reduction in vegetation cover would have led to more soil erosion, heavier sediment loads, and a flash flood regime in river systems. Human land use also had a major impact on the environment. Deforestation and ploughing contributed to increased runoff and sediment load in rivers, as well as gully formation, leading to higher drainage densities and a faster rate of erosion (Quine *et al.* 1999). These variables would have led to periodic ecological fluctuations, which may have triggered changes in human societies. As demonstrated in chapters 6 and 7, severe environmental catastrophes such as floods, the Yellow River’s changing courses, and seawater transgression during the third millennium BC may have had great effects on human societies, leading to population movement and competition among social groups for resources on the eve of state formation.

It is clear that the developmental processes of the Neolithic and early Bronze Ages in this region need to be examined against a broader background of environmental conditions. A review of possible inter-relationships between changing environmental conditions and archaeological cultural transformations will contribute to our understanding of the formation of complex societies.

Geographic settings

Topographically, the middle and lower Yellow River valley can be characterized as consisting of uplands in the west, great plains in the center, and a combination of highlands and riverine plains in the east. The Yellow River rises in the mountainous far west and flows eastwards across a wide extent of the loess plateau, in its middle reaches traversing Gansu, Ningxia, Inner Mongolia, Shaanxi, Shanxi, and western Henan provinces. The loess region has experienced severe soil erosion caused by hydraulic and human agents throughout history. Notably, the soil erosion has accelerated through time geometrically – much less in Neolithic times than later. It has been calculated that there has been a 100 percent increase in soil erosion on the loess plateau in the past 3,000 years, including a 50 percent increase in the last century (Quine *et al.* 1999). Consequently, the Yellow River and its tributaries carry a heavy load of silt from the loess plateau to the lowland regions in the east. As the river course enters the plains of central Henan, it becomes broader and its angle of descent decreases. Its water flows more slowly, depositing gravel and sand in the riverbed and, in times of flood, silt on the riverbanks and clay on the flood plain beyond. As a result, the bed is gradually raised above plain level; the river is maintained in its channel by systems of levee until it seeks a lower bed, leading to changes in the river's course. At least since the late Pleistocene, and throughout prehistoric and historic times, the Yellow River has repeatedly switched back and forth between the north and the south of the Shandong peninsula in its course to the sea (Murphey 1972; Wang Qing 1993). According to textual records, since the Warring States period (ca. 500–221 BC) the Yellow River has burst and flooded more than 1,500 times and changed course 26 times. On average there have been two floods every three years and one major course change in every hundred years (Hydraulic Ministry 1979: 248). The region of flooding extended from the Hai River in the north to the Huai River in the south, covering an area of 250,000 km^2 (Zou 1997: 88). When the Yellow River burst, its floodwaters sometimes did not retreat to its original course for several decades without human intervention (Twitchett and Loewe 1986: 241–243).

The lower Yellow River used to flow on more than one course. It became a single channel only when dykes were built in the mid-Eastern Zhou period to stabilize its lower course. Three major courses, dated to pre-Qin times (before 200 BC), are recorded in ancient texts (including *Shanhaijing*, *Yugong*, and *Hanshu*). These were all situated in the Hebei Plains to the north of the Yellow River's present course. At times of flooding in antiquity, the Yellow River took over the courses of tributaries of the Huai River, which are now flowing on the Huang-Huai Plains south of the Yellow River (Zou 1997: 87–118) (Figure 2.1).

The Central Plains were also dotted with a large number of lakes and marshes in antiquity. More than 40 lakes are mentioned in the pre-Qin texts, such as *Zuozhuan, Yugong*, and *Shanhaijing*, and about 190 lakes are recorded in *Shuijingzhu*, an ancient geographic text dated to the fifth century AD (Zou 1997: 161–162, 165–166) (Figure 2.2). It is very likely that the list of names of lakes appearing in pre-Qin texts is incomplete, and even more bodies of water existed in prehistoric times. Affected by

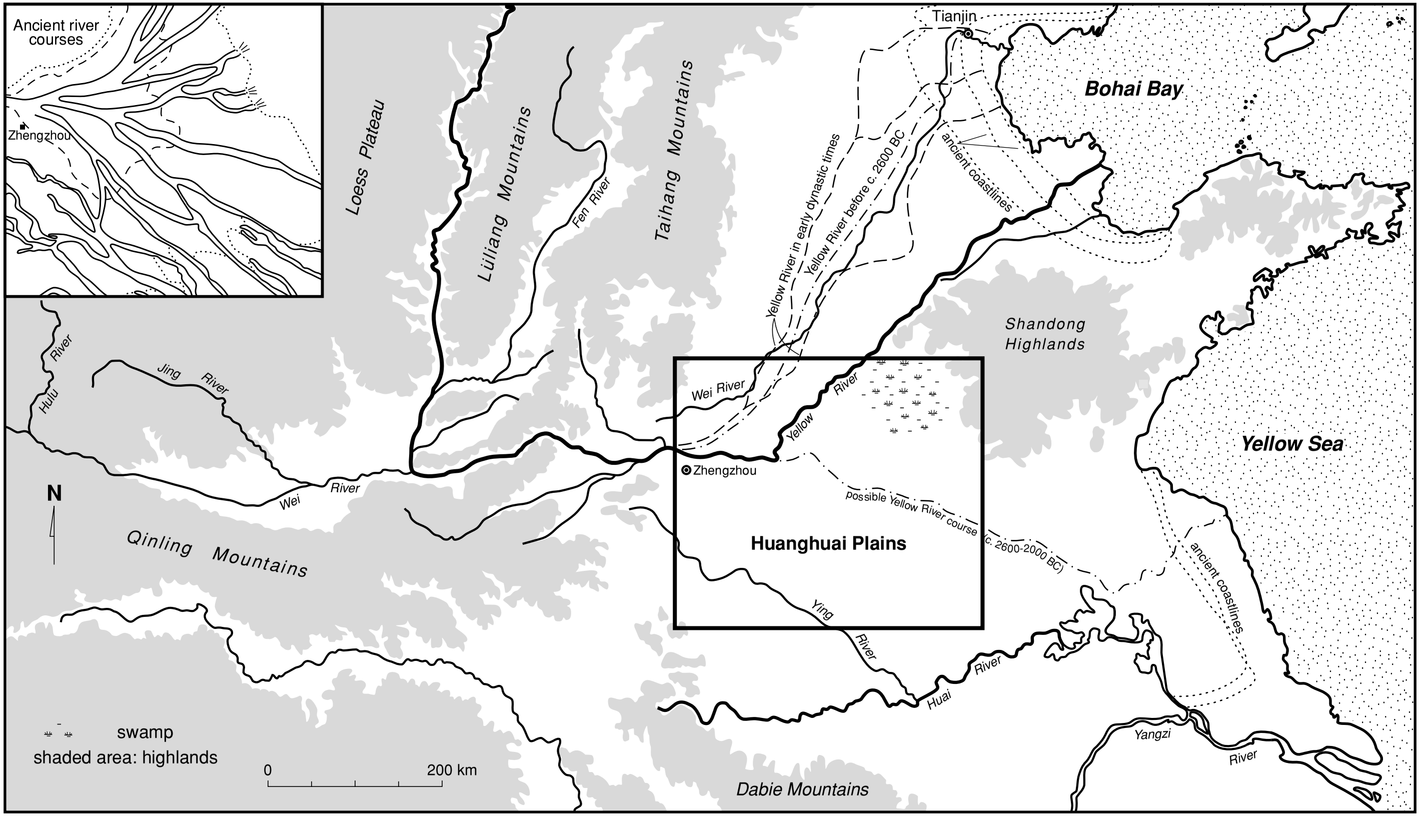


Figure 2.1 Map of the middle and lower Yellow River valley, showing major geographic features, changing courses of the Yellow River in prehistory (adapted from Wang Qing 1993: figs. 2, 3, 4), and mid-Holocene transgression maximum (Zhao Xitao 1993: 93). Map on the upper left-hand corner showing the distribution of ancient courses of the Yellow River: the broken lines indicate the area of Yellow River alluvia, and the dotted lines indicate the area of inter-river sediment (adapted from Wang Qing 1999: fig. 1).

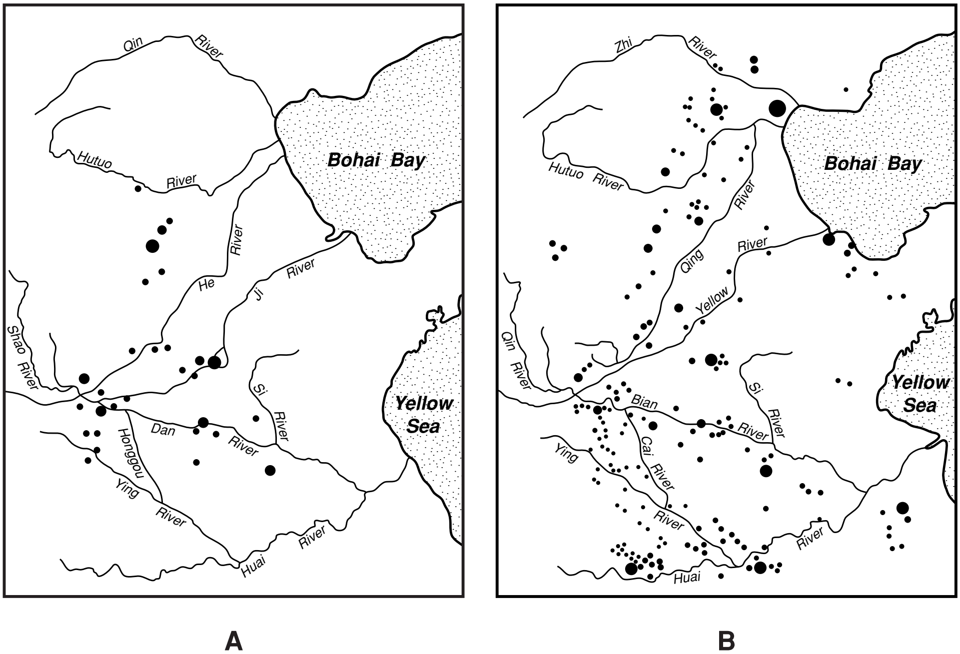


Figure 2.2 Distribution of major lakes on the Central Plains recorded in pre-Qin (200 BC) texts (A) and in *Shuijingzhu* (B) (adapted from Zou 1997: figs. 5–1, 5–2).

climatic fluctuation, river flooding, and intensive agricultural activities, the locations and sizes of these lakes have changed through history (Zou 1997: 161–174). Today, most of them are filled with silt and have disappeared from the landscape.

Reconstruction of paleoenvironment and cultural development

Research on Holocene environmental change is a relatively new field in Chinese geology, which has developed rapidly in recent years. A number of studies have outlined changes in climate, sea level, river courses, lakes, and geomorphology during the Holocene (e.g., Ren and Zhu 1994; Shi *et al.* 1993; Shi and Zhang 1996; Wang Shouchun 1993; Winkler and Wang 1993; Zhao Xitao 1993). Results of these studies have greatly enriched our knowledge of the Holocene environment, and have been used by archaeologists in conjunction with archaeological data to reconstruct the relationship of environment to cultural sequences. Consequently, many scholars have become increasingly interested in correlations observed between environmental changes and archaeological cultural transformations. It should be pointed out that the dating of the geological data is much less refined than archaeological dating, making it difficult to apply in archaeological interpretations. In addition, there are other problems not explicitly addressed in these studies, which are discussed below.

Problems with the reconstruction of paleoenvironment

Many geologists use archaeological evidence together with geological data to reconstruct paleoclimatic conditions. Except for a few new publications which use calibrated radiocarbon dates (cal. BP) (e.g., An *et al.* 2000; Morrill *et al.* 2003;

Yi *et al.* 2003), most geological chronologies are primarily derived from uncalibrated radiocarbon dates (BP); in contrast, all archaeological chronologies are based on calibrated dates (calibrated BP or BC). Since uncalibrated dates underestimate calendar dates by as much as a thousand years, these two sets of data are not directly comparable without calibrating the geological BP dates.

Paleoclimatic information is obtained largely from pollen profiles, which in fact do not indicate the time when climatic change took place. Since a lag of up to three hundred years exists between climatic change and vegetation response, this may reflect on pollen data (Bradley 1999: 365–370; Wick *et al.* 2003). Moreover, it takes time for human societies to respond to environmental changes. It is likely, therefore, that there is also a lag between environmental change and social transformation (if affected by new environmental conditions), and that this reflects on the archaeological record.

Taking all these factors into account, the paleoenvironmental data presented by geologists should not be used in archaeological interpretations without being evaluated independently. This statement, however, does not suggest that the results of current environmental studies are irrelevant. Such data can still provide a general framework for the understanding of environmental conditions on a large scale, and this may be related to the development of human societies. In the following discussion, I will summarize paleoclimatic information and archaeological cultural sequence, and evaluate the possible correlations between the two sets of data after taking consideration of dating problems. I will use calibrated BP dates generated by geological studies whenever possible, in order to compare with archaeological data. For those uncalibrated BP dates, I calibrate them using the OxCal with 95.4 percent confidence. Where standard deviation is not available for some of the dates, ±80 is used for the calibration process.

Paleoclimate and cultural development

Reconstruction of Holocence climate is based on studies of several types of evidence collected during the past seventy years in China – including pollen profiles, faunal and floral assemblages, paleosol, and the ice core record. In recent years, many researchers have pointed out that the East Asian monsoon has played a dominant role in influencing the paleoclimate and paleoenvironment of China. The East Asian monsoon moves gradually northward during the seasonal transition from winter to summer each year, and produces rainfall when the monsoon front interacts with a northern mass of cooler air. The rainfall belt migrates with the frontal system, leading to asynchronous onsets of summer monsoon precipitation in different areas. During the Holocene the zone of peak rainfall conditions associated with the East Asian summer monsoon shifted latitudinally across China in response mainly to changing solar radiation and surface boundary conditions of the Northern Hemisphere (An *et al.* 2000; Li Xiaoqiang *et al.* 2003). The strength of the East Asian monsoon, which is especially associated with the level of precipitation, therefore, seems to have been one of the most important factors affecting not only environmental conditions, such as lake levels, vegetation, and river floods, but also the ecological adaptation of the people in this region.

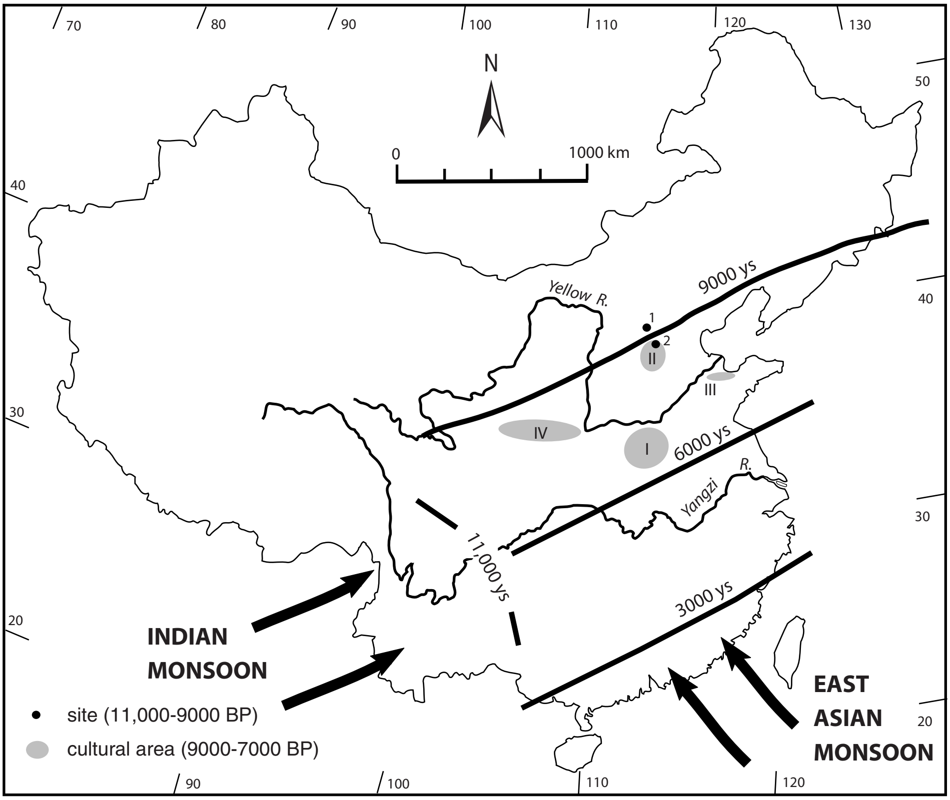


Figure 2.3 The maximum positions of the East Asian Monsoon frontal around 9,000, 6,000, and 3,000 years ago in China (adapted from An *et al.* 2000: fig. 13), in relation to the early Neolithic sites and cultures in the Yellow River valley. 1: Hutouliang; 2: Nanzhuangtou; I: Peiligang culture; II: Cishan culture; III: Houli culture; IV: Laoguantai culture.

The initial Neolithic period (ca. 9000–7000 BC) The start of the Holocene in China is characterized by a gradual climatic transition from cool and dry to warm and wet conditions. It is primarily caused by the strengthened East Asian monsoon, as the northernmost frontal zone of monsoon rainfall advanced northward into the present arid and semi-arid regions around 11,000–10,000 cal. BP (An *et al.* 2000: 758; Morrill *et al.* 2003). The pollen data from 12,000–9,800 cal. BP suggest that in many places of central China the steppe grasses may have been gradually replaced by broad-leaved forests, although xerophytic herbs were still present (Yi *et al.* 2003). During this period, the Central Plains witnessed the initial development of sedentary villages. This is indicated by the earliest pottery, grinding slabs and rollers, possibly domesticated pigs and dogs, and domestic features (hearths and ash pits), discovered at Nanzhuangtou in Xushui (ca. 10,500–9,700 BP) and Hutouliang in Yangyuan (ca. 11,000 BP), Hebei (Baoding Bureau 1992; Gui and Jun 2002). It is notable that these two sites are situated near the frontal zone of monsoon rainfall around 9,000 cal. BP (Figure 2.3).

The early Neolithic period (ca. 7000–5000 BC) There are various opinions regarding the time frame of the Holocene optimum in different parts of China, partly due to the variability with which the East Asian monsoon affected different regions in China (e.g., An *et al.* 2000; Li Xiaoqiang *et al.* 2003). A recent study designates a period of 9,800–4,500 cal. BP as the Holocene optimum in China. The precipitation increased significantly and high lake levels prevailed in most parts of eastern and central China around 10,000–7,000 cal BP (An *et al.* 2000: 747, 758). In the lower Yellow River region the optimum is implied by the presence of monsoonal evergreen forest associated with diverse broad-leaved deciduous taxa and abrupt decrease of herbaceous taxa, conifers, *Pinus*, and *Fagus* (e.g., Yi *et al.* 2003: 624).

Coinciding with the beginning of the Holocene optimum is the emergence of early Neolithic cultures in the Yellow River valley (ca. 7000–5000 BC). This is marked by the gradual development of farming villages scattered on the alluvial plains across different cultural regions. The material assemblages are referred to as the Peiligang culture in Henan, the Cishan culture in south Hebei, the Houli culture in north Shandong, and the Laoguantai culture in Shaanxi (Figure 2.3). Sedentary ways of life had already been established, indicated by the evidence of domestic animals and plants found at many sites. Domesticated animals include pigs, dogs, and possibly chicken (Zhou Benxiong 1984). Millet was a common staple in most regions, while rice was cultivated in some areas, such as Jiahu in southern Henan (Henan Institute 1999), where the environment was warmer and moister compared with the north. During this period, at least seventy Peiligang sites (National Bureau 1991), thirty-seven Laoguantai sites (National Bureau 1999), and about a dozen Houli sites have been identified (Luan 1996a: 44–46; 1997d). Most sites are small, no larger than 6 ha, and cultural deposits are thin.

The middle Neolithic period (ca. 5000–3000 BC) Driven by the intensified monsoon, a warmer and more humid phase, the Middle Holocene climatic maximum, occurred around 7,200–6,000 BP. Lakes on the North China Plains enlarged in area, while the desert in western China reduced in size due to the expansion of vegetation. The Lake Qinghai region, which is a steppe today, was then covered by forests with mixed conifer and broadleaf trees, with an annual precipitation of 600 mm and an average temperature 3 °C higher than at present. In the middle Yellow River the paleosols were well developed (Shi *et al.* 1993). A large part of the Yellow River valley was covered by vegetation belonging to the sub-tropical forest zone (Winkler and Wang 1993: 247) (Figure 2.4). This period of climatic maximum, however, was followed by an episode of weakened East Asian monsoon around 6,000 cal. BP, when the belt of maximum precipitation retreats southwards to the middle and lower reaches of the Yangzi River (An *et al.* 2000: 758) (Figure 2.3).

The Middle Holocene climatic maximum and the subsequent change correspond roughly to the middle Neolithic period (ca. 5000–3000 BC), including the Yangshao culture in Shaanxi, Shanxi, and Henan, and the Beixin and Early Dawenkou cultures in Shandong. During this period the population appears to have increased rapidly across regions. About 800 Yangshao sites have been discovered in Henan, and about

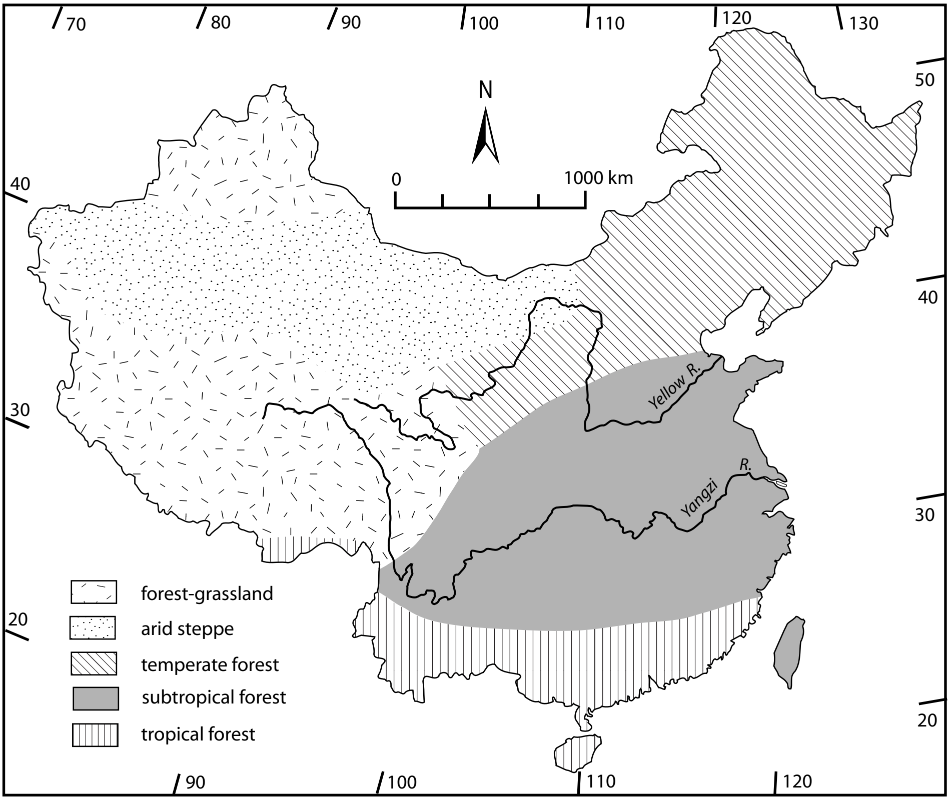


Figure 2.4 Paleovegetation map constructed from pollen and macrofossil evidence for 6000 BP (adapted from Winkler and Wang 1993: fig. 10.11).

2,000 sites in Shaanxi (National Bureau 1991, 1999). The distribution of these sites is rather uneven among regions. In Henan due to high precipitation and expansion of the fresh water areas in the lowland regions, much of the Central Plains lowlands were probably covered by water. Yangshao sites in these areas are small and scattered, and tend to be located on relatively high ground (Cao Bingwu 1994: 64). By contrast, in the highlands in southern Shanxi, western Henan, and Shaanxi, the Yangshao culture flourished as indicated by the dense distribution of sites. Especially during the mid-Yangshao period, known as the Miaodigou phase (ca. 4000–3500 BC), settlements increased dramatically in number and size. As documented in survey records from Shaanxi, Miaodigou sites doubled in number compared to the previous Banpo phase, and expanded into broader regions towards the north. Some large sites, up to 90 ha in size, have been found in western Henan (Institute of Archaeology 1999a) (see chapters 6 and 7).

In Shandong more than fifty Beixin culture sites, most dated to the fifth millennium BC, have been found on high ground near mountainous regions, on terraces along rivers, and at locations near where rivers enter the sea (Wu Jianmin 1990: 239–40; Zhang Xuehai 1989). Archaeological sites belonging to the Dawenkou culture

(4100–2600 BC) increased rapidly in number. These Dawenkou settlements are mainly centered in the Taiyi mountain areas and in north Jiangsu, although the entire distribution of the Dawenkou culture covers a much larger region, extending east to the coastline and even to the southern part of the Liaodong peninsula, south to the Huai River and northeast Anhui, north to the Bohai Bay, and west to eastern Henan (Gao Guangren 1978: 400; Wu Ruzuo 1982).

There seems to be a gap of about 1,000 years between the southward retreat of the East Asian monsoon (6,000 cal. BP) and notable abrupt climatic changes in the Yellow River region (5,000 cal. BP), as described below. This apparent delay may be caused by relatively low resolution in the analytical time scale. In any event, this time period (the fifth millennium BC) appears to coincide with the middle and late Yangshao period, when social inequality began to emerge, as discussed throughout the book.

The late Neolithic period (ca. 3000–2000 BC) As the East Asian monsoon started to weaken from 6,000 cal. BP, the climate became colder and/or drier across the Asian monsoon region. Paleoclimatic records show an abrupt cooling period (5,000/4,500–2,700 cal. BP) which is associated with lower lake levels (Ren and Zhang 1998), a reduction of monsoonal evergreen and broadleaved deciduous trees, and a rising frequency of herbaceous, coniferous, *Pinus* and *Fagus* pollen in the lower Yellow River region (Yi *et al.* 2003).

Corresponding to this climatic shift, the Longshan culture (ca. 3000–2000 BC) developed in the Central Plains. Archaeological records show that in most regions the population density reached its peak in the late Neolithic (Figure 2.5): there are over 1,000 Longshan sites in Shandong (2600–2000 BC) (Luan 1996a: 207), some 2,200 Longshan sites in Shaanxi (National Bureau 1999), and about 1,000 Longshan sites in Henan (National Bureau 1991).

In the coastal regions, the sea level seems to have been lower than during the previous period, and alluvial plains were rapidly formed in the delta region of the ancient Ji River (which flowed through the region where the lower course of the Yellow River flows today). Consequently, settlements began to spread over even broader areas in northern Shandong, as the coastline moved eastward and population increased dramatically.

In Henan, it is the lowland region of central Henan that revealed the sharpest increases in site numbers. This region may have become more readily habitable for Neolithic settlers, perhaps due to the reduction of lakes and marshes. In Shaanxi about 2,000 Longshan sites have been found, but 68 percent of them are located in the northern Shaanxi plateau (National Bureau 1999) (Figure 2.5), while there is a decline in the number of sites in central Shaanxi. This phenomenon may be attributable in part to population movement from the alluvial plains in central Shaanxi to the north plateau areas (chapter 7).

Climatic fluctuations and social responses Geological investigations have reported several episodes of climatic fluctuation during the Holocene optimum

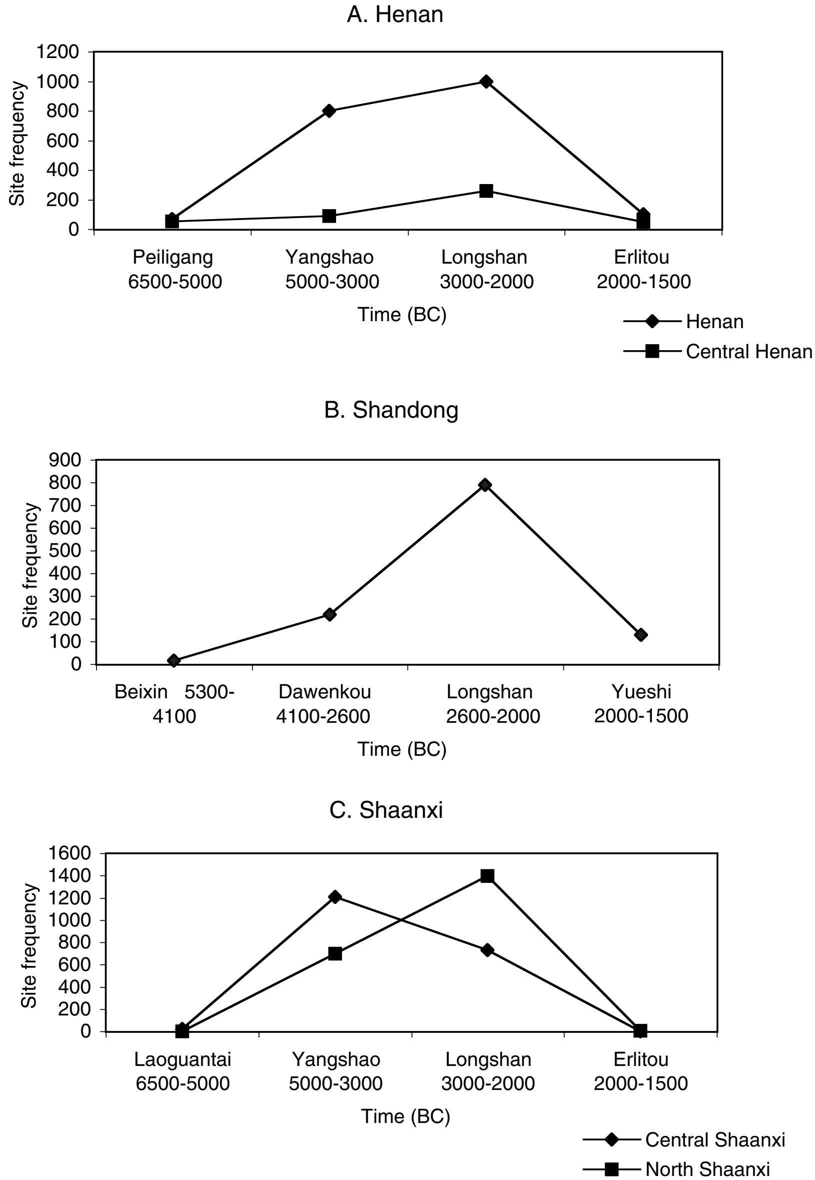


Figure 2.5 Changes in site frequency from the Early Neolithic to the Early Bronze Age in Henan, Shandong, and Shaanxi.

(Jian *et al.* 2000; Shi *et al.* 1993; Xu Qinghai *et al.* 1988; Zhou Shangzhe *et al.* 1991), although the dates for these events differ in these reports. These fluctuations in temperature and precipitation correlate with changes in other ecological conditions of the region, as described below.

First, there was fluctuation in the elevation of the Eastern China Sea during the post-glacial period (Figure 2.6); this changed the landscape of the coastal areas.

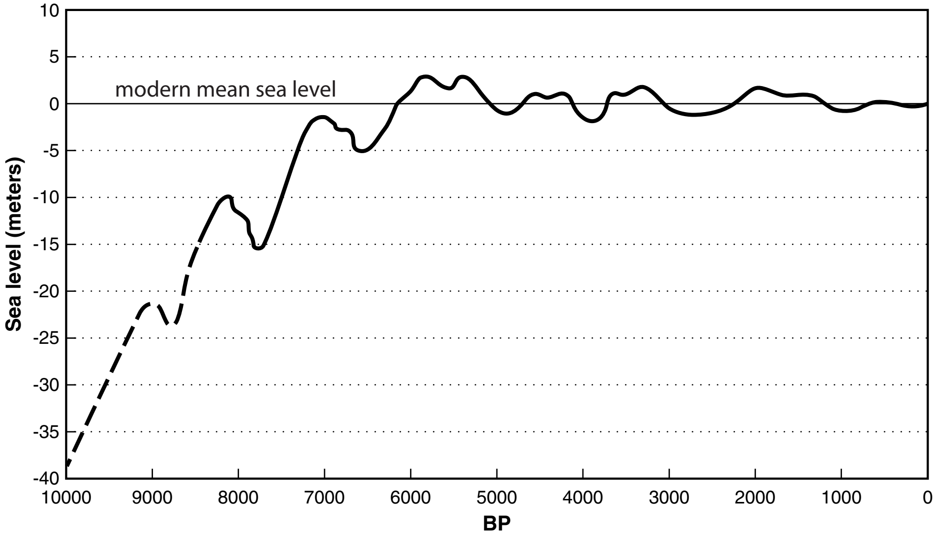


Figure 2.6 General curve of Holocene sea-level changes along coastal areas in China (adapted from Zhao Xitao 1993: 39).

In the Bohai Bay area, the coastline in 8,000–7,500 BP more or less resembled that of modern times. The highest sea level occurred during the period of 7,000–6,000/5,500 BP, reaching 3 to 5 m higher than at present; the coastline moved westward about 30 to 100 km inland. During the period of 6,000–5,000 BP, the sea level was about 1 to 3 m higher than at present. After 5,000 BP, although it tended to decrease in general, an instance of high sea level occurred again around 4,000 BP (Zhao Xitao 1996: 44–83). In northern Jiangsu, a similar pattern of changes in the coastal region has also been observed in the chenier (low beach ridges) record. The sea level reached the highest point during the period 6,500–4,000 BP (5570–2200 cal. BC), and the marine transgression may have reached as far as the Grand Canal area (Zhao Xitao 1996: 83–98), which is more than 100 km west of the present coastline. As a result of these changes, landscapes in the Bohai and northern Jiangsu regions may have altered dramatically from land to ocean, and vice versa (Wang Qing and Li 1992; Wu Jianmin 1990; Zhao Xitao 1984: 178–194; 1993; 1996: 44–100) (Figure 2.1).

Second, the Yellow River shifted its lower course several times during the Neolithic. Scholars have attempted to reconstruct a timetable of prehistoric changes in the Yellow River's course, based on studies of cheniers in the Hebei and northern Jiangsu Plains (whose formation may have been affected by the movement of the ancient Yellow River courses), of the distribution of Neolithic sites in the lower Yellow River valley, and of ancient texts which record the locations of the Yellow River. At least two major shifts of the river course occurred during the Neolithic period. For most of the Neolithic period the Yellow River flowed through the Hebei Plains and discharged into the Bohai Bay. Around 4,600 BP (3650–3000 cal. BC), the river course changed to the northern Jiangsu Plains and emptied into the Yellow Sea. Yet another change took place about 4,000 BP (2900–2200 cal. BC), when the river course switched back to the Hebei Plains (Wang Qing 1993a, 1999b) (Figure 2.1).

It is notable, however, that climatic fluctuations may not be the only source of the flooding. Soil erosion caused by increased Neolithic agriculture in the loess regions along the tributaries and middle reaches of the Yellow River may have contributed to a higher sediment content in the waters, raising the bed and the banks of the river, and leading to more extensive flooding on the eastern plains (see chapter 7). Moreover, the Yellow River was apparently not the only river affected by climatic fluctuations; many other rivers would have manifested similar changes.

Environmental changes have no doubt affected human societies in their ecological adaptations, subsistence strategies, and social organization. For example, as the sea level rose to the highest point during the period 6,500–4,000 BP (5570–2200 cal. BC) in northern Jiangsu, marine transgressions may have led to the inundation of lowland areas and the abandonment of settlements near the east coat. There is a period of site absence in northern Jiangsu from mid-Dawenkou to early Longshan (ca. 3500–2300 BC) (Archaeological Team 1990), while there seems to have been a Dawenkou settlements expansion toward northern Anhui and central Henan during the middle to late Dawenkou period (ca. 3500–2600 BC) (Du Jinpeng 1992b; Wang Jihuai 1997). These changes coincide with the era of maximum marine transgression.

Also, the rapid growth of population and environmental changes may have contributed to further competition among social groups, leading to political integration, military domination, and social stratification. Archaeological records show that many Longshan settlements were enclosed by rammed-earth walls, while warfare or violence were practiced, and social organization in many communities became increasingly hierarchical. As discussed throughout this book, social changes took place rapidly in all regions over the middle and lower Yellow River valley during this period, leading to the emergence of civilization/state in north China.

Human activities may place stress on eco-systems, leading to human induced environmental deterioration. For example, agricultural activities have been the major cause of soil erosion and high sediment yields in the loess plateau (Quine *et al.* 1999). The rapid growth of farming communities during the late Neolithic in northern Shaanxi, therefore, must have caused severe soil erosion and increased sediment yields in this environmentally vulnerable region. This, in turn, would have led to the build up of natural levees, followed by more frequent flooding and changes in water courses in the lower Yellow River.

The early Bronze Age – Erlitou (ca. 1900–1500 BC) The Longshan culture in the Yellow River valley declined around 2000 BC, followed by the appearance of Erlitou culture in Henan, which has been designated a part of the Xia dynasty, and the Yueshi culture in Shandong (ca. 1900–1500 BC). The climatic condition seems to have been warmer and more moist than at present during the early dynastic period, as suggested by pollen remains, and by ancient texts which refer to animals and plants existing in the Xia and Shang times in northern China (Man 1992: 266–269). Remains of elephants (*Elephus maximus*) have been found in Yangyuan, Hebei ($3,630 \pm 90$ BP and $3,830 \pm 85$ BP [2,300–1,700 and 2550–1950 cal. BC]) (Jia and Wei 1980); species belonging to sub-tropical fauna have been found in Anyang, including Pere David's deer (*Elaphurus davidianus*) dating to middle Shang (ca. 1400–1250 BC) and water buffalo dating to middle and late Shang (1250–1046) (Chardin and Young 1936; Yuan and Tang 2000).

For some reasons remaining to be investigated, the number of settlements diminished cross-regionally. Only about 126 sites are dated to the Yueshi culture in the aforementioned sample area (14 percent of the Longshan sites), Some 200 Erlitou sites have been found in Henan (20 percent of the Longshan sites). In central Shaanxi archaeologists have had difficulties locating more than a few Erlitou sites (Figure 2.5). However, in contrast to a general decline of population, the core area of the Erlitou culture in the Yiluo basin experienced a marked social transformation starting around 1800 BC, with rapid settlement nucleation and urbanization, marking the formation of the first state in China (chapter 8).

As mentioned in "Qiushuipian" in *Zhuangzi*, a fourth-century BC document, the period prior to the Xia dynasty was believed to have suffered from heavy precipitation in nine out of every ten years (cited in Wang Shouchun 1993: 35). The Lajia site in Minhe, Qinghai province, dated to the late part of the Qijia culture (ca. 2000–1800 BC), has revealed the results of natural disaster. Sixteen human skeletons were found on the floors of two houses, and from their positions it is possible to conclude that these people were killed by a flood from the Yellow River (Ganqing Team and Qinghai Institute 2002). In the eastern regions, conditions may have worsened due to the Yellow River's change of course from south back to north, which probably caused drastic flooding in the inland region (Wang Qing 1996; Wang Shouchun 1993). These floods may have been accompanied by marine transgression in the coastal regions, as the sea level rose around 4,000 BP, indicated by the chenier in Huanggua dated to 3920 ± 120 BP (2900–2000 cal. BC). There may have been other catastrophes, such as drought, earthquake, and damage from freezing, which, according to the ancient texts, characterize this calamitous era (Wang Qing 1999: 35). The archaeological record indicates that in some regions settlement density became extremely low for several hundred years after the Longshan period (see chapter 7).

The climatic fluctuation anticipating the social transition at the end of the Longshan culture around 2000 BC is thought to coincide with legendary accounts of the Great Flood which occurred in the lower Yellow River valley prior to the Xia dynasty, and of the legendary hero, Yu, who regulated the floodwater and became the first king of the Xia dynasty. This gives weight to the idea that oral history recorded in later texts may not be a simple fabrication (Wang Qing 1999; Wang Shouchun 1993).

Conclusion

In recent years there has been an increase in interdisciplinary studies of paleoenvironments and their role in social processes – especially the development and decline of civilization (e.g., Crumley 1995; Curtis and Hodell 1996; Freter 1994; Hole 1994; Rosen 1995; Weiss *et al.* 1993). Severe ecological fluctuation can alter social conditions and stimulate new patterns of social adaptation. The response of various existing social settings and strategies to environmental stresses may have led to different consequences in social process – development or collapse of a social system. For instance, in southern Mesopotamia ecological stresses may have triggered large-scale social change by upsetting precarious balances among different social groups and systems of agro-pastoral production; these led to massive demographic realignments, and ultimately, to urbanization (Hole 1994). Similarly, in the Iron Age of temperate Europe climatic change may have affected socio-economic transformations (Crumley 1995). Long-term climatic deterioration and society's failure to adjust to such change may have contributed to the collapse of the Early Bronze Age civilization in the southern Levant (Rosen 1995). Notably, these cases do not argue for a simple revival of climatic determinism, but serve to emphasize that the response of social structure and human behavior to environmental impact is significant for explaining change in social structure.

In China the regional Neolithic cultures experienced different trajectories toward social complexity, which must have been affected, to some extent or other, by the particular ecological settings in which these ancient stratified societies arose. Apparently, from the late fourth to early second millennium BC, social transformation from relatively egalitarian societies to state-level social organization was accompanied by a series of changes in climate, ecology, and geomorphology. Environmental changes may not have been direct causative factors leading to the social transformation, but pre-existing social structure and human behavior in response to environmental impact are crucial in explaining that change. In the following chapters I examine the interplay between social dynamics and environmental factors in the developmental processes of social complexity in the region under examination. This is not intended as a means to pursue an agenda of environmental determinism, but rather to illustrate that the decisions made by ancient farmers and rulers alike cannot be fully understood without securely aligning them with chronological changes in climate and the environment.

3

Household subsistence and ritual

> In the degenerate time of Shao-hao, however, the Nine Li threw virtue into disorder. Men and spirits became intermingled, with each household indiscriminately performing for itself the religious observances which had hitherto been conducted by the shamans. As a consequence, men lost their reverence for the spirits, the spirits violated the rules of men, and natural calamities arose.
>
> "Severance of heaven–earth communication" in *Kuoyu,* a fourth-century BC text; translated by Derk Bodde (1961)

Introduction

The household is the most common social component of subsistence, the smallest and most abundant activity group. It is composed of three elements: social, material, and behavioral (Wilk and Rathje 1982b: 618). A household, as the most basic social unit, provides crucial information for understanding economic, ecological, and ritual processes in a given society. Although archaeologists recover dwellings and domestic artifacts, not social units, we can infer the corresponding social units based on non-random patterns revealed in the material remains of architecture.

Understanding household behavior has been one of the aims in household archaeology. This may be achieved by investigating patterns of architectural remains and associated artifacts (e.g., Allison 1999; Blanton 1994; Kent 1990c). Architecture is a reflection of behavior, which, in turn, is a reflection of culture (Kent 1984, 1987; 1990a: 3). The factors which affect the built environment include both cross-cultural and culture-specific variables. From a cross-cultural perspective, social complexity determines the organization of space and of the built environment, particularly with respect to partitioning or segmentation (Kent 1984, 1990b); therefore, it is possible to investigate the complexity of given societies based on their architecture and related use of space. Since systems of human activities and systems of built environment are linked through meaning, which is culturally specific (Rapoport 1990), a contextual analysis of household remains may provide some insights for decoding such meanings. This chapter aims to explore the general social implications of, and specific cultural meanings underlying the built environment in Neolithic China.

I will first investigate general changes in household activities during the Neolithic period, based on some best-preserved architectural remains in different sites across the region, and then focus on one household example from a Longshan site at Kangjia in Shaanxi. By studying the contextual relationships of archaeological features, artifacts, and faunal, floral, and human remains excavated from this residential unit,

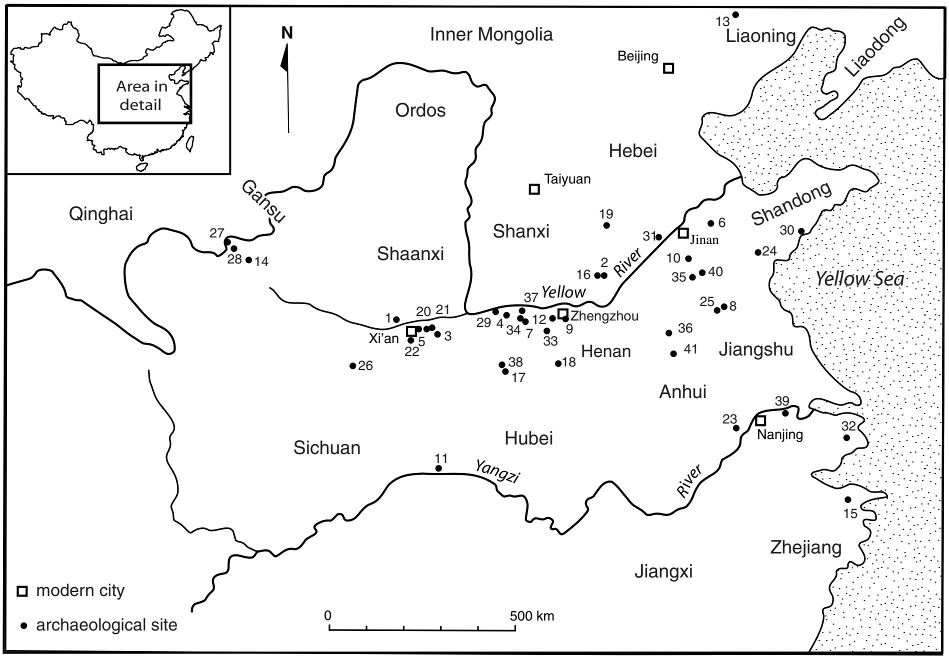


Figure 3.1 The major sites mentioned in chapter 3.
1: Anban; 2: Anyang; 3: Baijia; 4: Bancun; 5: Banpo; 6: Bianxianwang; 7: Cuoli; 8: Dadunzi; 9: Dahecun; 10: Dawenkou; 11: Daxi; 12: Dianjuntai; 13: Fuhegoumen; 14: Fujiamen; 15: Hemudu; 16: Hougang; 17: Huanglianshu; 18: Jiahu; 19: Jiangou; 20: Jiangzhai; 21: Kangjia; 22: Keshengzhuang; 23: Lingjiatan; 24: Lingyanghe; 25: Liulin; 26: Longgangsi; 27: Majiawan; 28: Majiayao; 29: Miaodigou; 30: Sanlihe; 31: Shangzhuang; 32: Songze; 33: Wangchenggang; 34: Wangwan; 35: Wangyin; 36: Wangyoufang; 37: Xiaopangou; 38: Xiawanggang; 39: Weidun; 40: Yinjiacheng; 41: Yuchisi.

I attempt to reconstruct household socio-economic and ritual activities which may have occurred there. The Longshan culture was not a monolithic entity, but consisted of diverse social groups; the meanings behind the built environment in different areas were probably heterogeneous. The cultural characteristics generated from the analysis of this one household may lead to a further investigation of the variability of household patterns in the Longshan culture.

The major sites mentioned in this chapter are shown in Figure 3.1.

Household activities: a general survey

I investigate household activities from three aspects in order to understand the development of social complexity. First is the emergence of segmentation in household activities relating to subsistence economy, second is the change of household material possessions in quantity and variety, and third is the practice of household rituals, especially feasting and human sacrifice. I approach these issues from a diachronic perspective in order to see changes through time.

A general model based on cross-cultural ethnoarchaeological studies suggests that as a society becomes more complex, it manifests a more segmented and differentiated culture (including socio-political stratification, hierarchies, rigid division of labor, and economic specialization), and tends to use more segmented activity areas, cultural material, functionally discrete objects, and gender-restricted items (Kent 1984, 1990b). Based on this model, it is expected that in residential areas of diachronically arranged archaeological sites, first, the distributions of tools will show patterns of increased segmentation in gender and function, and, second, the material goods in houses will increase in quantity and variety through time.

Gender and functional segmentation in household activities

The ratio of gender-specific to non-gender-specific and functionally restricted to multi-purpose loci can be described as a continuum between segmentation and unity, to measure the degree of social complexity (Kent 1984; 1990b). By analyzing contextual data from residential remains, information on the organization of household activities, particularly segregation and partitions, can be obtained (e.g., Flannery and Winter 1976: 42–45; Kent 1990b). However, definitions of the gender- and function-related activity areas in the built environment are culture-specific. Implements found on the house floors may be used to identify activities carried out by men, women or both, but we need to know what tools were used by which gender in a particular society before patterning the distribution of these implements.

In order to determine the gender-related use of tools I examine the correlation between tool types and burials of different sexes. Four burial assemblages from three sites, dating to the early, middle- and late-Neolithic periods, are selected because they are relatively large in sample size and rich in grave goods. These are Jiahu in Henan (the Peiligang culture; ca. 7000–5800 BC), Longgangsi in Shaanxi (the mid-Banpo phase of the Yangshao culture; ca. 4500–4200 BC), and Sanlihe in Shandong (the Dawenkou, ca. 2500 BC, and Longshan cultures; ca. 2300–1800 BC) (Appendixes 1.1–1.4). The results of the analysis suggest that in most cases female tool types are fewer than male tool types; and that the former are primarily restricted to domestic implements such as grinding stone for food processing and spindle whorls, while male tool types tend to be dominated by production implements such as axes, adzes, spades, and arrowheads.

The results also show marked changes in ratios between gender-specific and non-gender-specific tools from the early to late Neolithic periods. The gender-specific tools make up 38 percent and 34 percent of the total tool types at Peiligang and Yangshao assemblages, respectively, but increase to 79 percent and 80 percent of the total tool types in the Dawenkou and Longshan assemblages, respectively (Figure 3.2). Such an increase of gender-specific tool types corresponds to increasing social complexity, as the Peiligang and Yangshao societies were relatively egalitarian, while the Dawenkou and Longshan societies had become stratified. This result is consistent with the analysis of grave goods from several Dawenkou culture burial sites by Richard Pearson, who concluded that males were buried with more tools than females, representing almost all categories of activity – agriculture (axe, sickle, spade, and knife), hunting (spear, pointed knife, arrowhead, fishhook), and maintenance (small spade, chisel, whetstone). Females had more needles and spindle whorls (Pearson 1981: 1084). These phenomena suggest that the division of

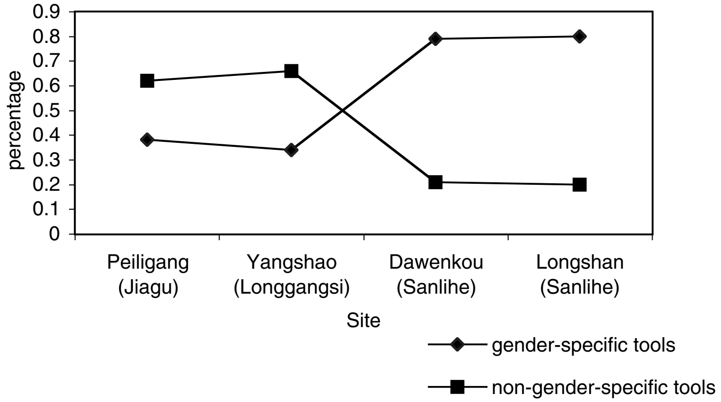


Figure 3.2 Comparison of the ratio of gender-specific tools in four burial sites dating to the Peiligang, Yangshao, Dawenkou, and Longshan cultures, indicating an increase in the use of gender-specific tools as social complexity developed.

labor based on gender became explicit as societies became more complex during the Neolithic period.

It is notable that only very rarely has an entire set of artifacts been found on the floor of a Neolithic house; my analysis therefore relies on examples from several sites, of different regions, in which artifacts were well preserved on the floors. These buildings were burnt down, and artifacts were well preserved since collapsed walls and roofs covered them. Three examples are used here to demonstrate the variability of artifacts found on house floors.

The first example is house F17 from Jiangzhai, in Lintong, Shaanxi, dating to the Banpo phase of the Yangshao period (ca. 4800–4300 BC). In this period the Jiangzhai settlement was partitioned into five residential clusters; each cluster included a number of buildings in different sizes centered on a large house, and doors of houses all faced the main plaza in the center of the site (see chapter 4 for details). House F17 was a medium-size semi-subterranean house (30 m^2) in the eastern residential cluster (Figure 4.4). On the house floor 13 artifacts were found, including 7 pottery vessels, 4 tools (a stone adze, a bone awl, a pottery file, and a bone arrowhead), and one ornament (Xi'an Banpo Museum *et al.* 1988: 23). In order to determine gender-related tools I analyzed the burials near the residential area. Jiangzhai had a large number of tombs, but the quantity of tools associated with sex-identified burials ($N = 23$) is too small to be statistically reliable. Therefore, this analysis is based on the tool assemblages combined between two Yangshao sites, Longgangsi, and Jiangzhai (Appendixes 1.2, 1.5). According to this database only the adze was a male-dominant tool, and the other three types of tools from F17 were associated with both men and women. These tools appear to be scattered around the hearth, with no obvious pattern observable in gender- or function-segmentation (Figure 3.3).

The second example is house F11 from the Huanglianshu site in Xichuan, Henan, dating to the Qujialing culture about 2700 BC (Henan Archaeology Team 1990). It is a double-roomed house in a residential compound. This house consists of two

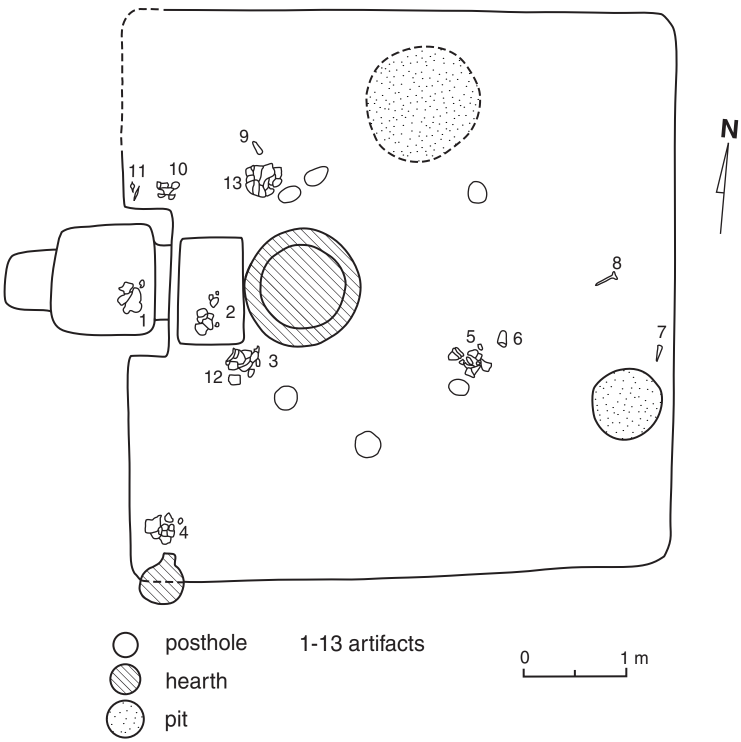


Figure 3.3 Plan of House F17 with artifacts found *in situ* on the house floor at Jiangzhai, Banpo Phase, Yangshao culture (1: pottery basin; 2, 10, 12, 13: pottery bowls; 3, 5: pottery jars; 4: pottery urn; 6: adze; 7: awl; 8: bone hairpin; 9: pottery file; 11: bone arrowhead), (adapted from Xi'an Banpo Museum *et al.* 1988: fig. 13).

interconnected rooms: the western one (13.6 m^2) and the eastern one (19.2 m^2). There were two hearths, one in each room, and three entrances to the courtyards. About 30 artifacts including tools and pottery were unearthed in the rooms, most of which were grouped into five clusters (Figure 3.4).

In this case, the gender-related tool types are determined by the data from Dawenkou and Longshan burials (Appendixes 1.3, 1.4, 1.6), since we lack mortuary information from Qujialing culture sites. Judging from the functions of pottery vessels and tools distributed in different locations of this household, the western room was probably used for food preparation and storage, and the eastern room was used as a bedroom because there is a large space in this room where no artifacts were found. Female domestic activities (e.g., sewing and spinning) were carried out, and tools were kept in the eastern room, while the placement of arrowheads and axes seems to suggest that the male(s) of this household was (were) likely to use the western room as a working and/or storage space. Although there were two hearths in the house, only the one associated with a set of food-preparation vessels may have been used for cooking. This house was likely to have been occupied by a nuclear family which may have formed a basic production unit, both the division of labor and the occupation of working space being based on gender.

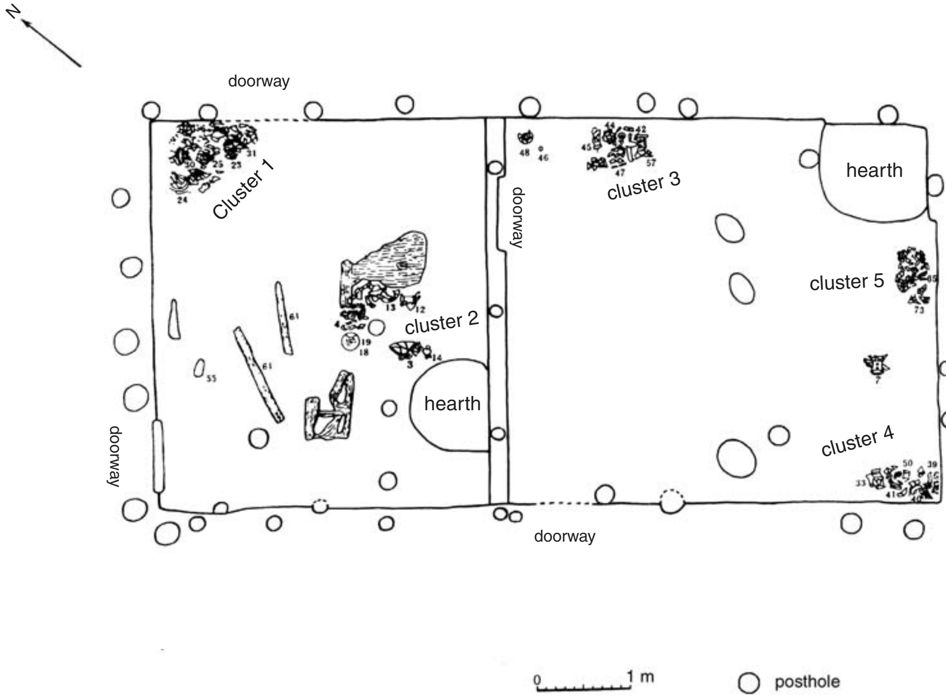


Figure 3.4 Plan of House F11 with artifacts found *in situ* on the house floor at Huanglianshu, Qujialing culture. Cluster 1: 3 jars, 1 painted pottery *hu* vessel, 1 jar, 1 stemmed cup, and 1 vessel lid. Cluster 2: 1 tripod, 1 bowl, 1 *bo* container with rice inside, 1 painted pottery *hu* vessel, and 1 cup. Cluster 3: 2 stemmed cups, 2 cups, 1 small stone ball, 1 ceramic spindle whorl, and 1 stone sickle. Cluster 4: 1 bone needle, 3 cups, and 1 vessel lid. Cluster 5: 1 pottery bowl and 1 pottery stemmed cup (adapted from Henan Archaeology Team 1990: fig. 19).

The third example is from house F37 at Yuchisi in Mengcheng, Anhui, dating to the late Dawenkou culture (ca. 2800–2600 BC). Yuchisi was a village surrounded by a moat, and at least 55 houses and some 200 burials have been found inside the moat. All the buildings were burnt down, perhaps intentionally (Institute of Archaeology 2001; Wang Jihuai and Zhang 2001) (Figure 4.13). House F37 (17.71 m^2) yielded 66 artifacts from the floor, including 42 ceramic vessels and 24 tools (Appendix 2.1). Most of the artifacts were spread over the north part of the room near the hearth, probably caused by the collapse of the building structure. Ten types of tools were found. The gender-related tool types are determined by the data from burials at Yuchisi and other Dawenkou sites. Among the tools found in F37 the spindle whorl was a female tool; arrowhead, axe, wedge, and adze were male tools; and grinding stone, bell, pottery pole, spade, and potter's tool were unclear in terms of gender association. Although the collapsed building structure had disturbed the original locations of these artifacts, we can still see that most female tools were uncovered from the right side of the room, while most male tools were found on the left side (Figure 3.5). Similar to the Huanglianshu case, this pattern seems to suggest a gender-related segmentation in the arrangement of tools.

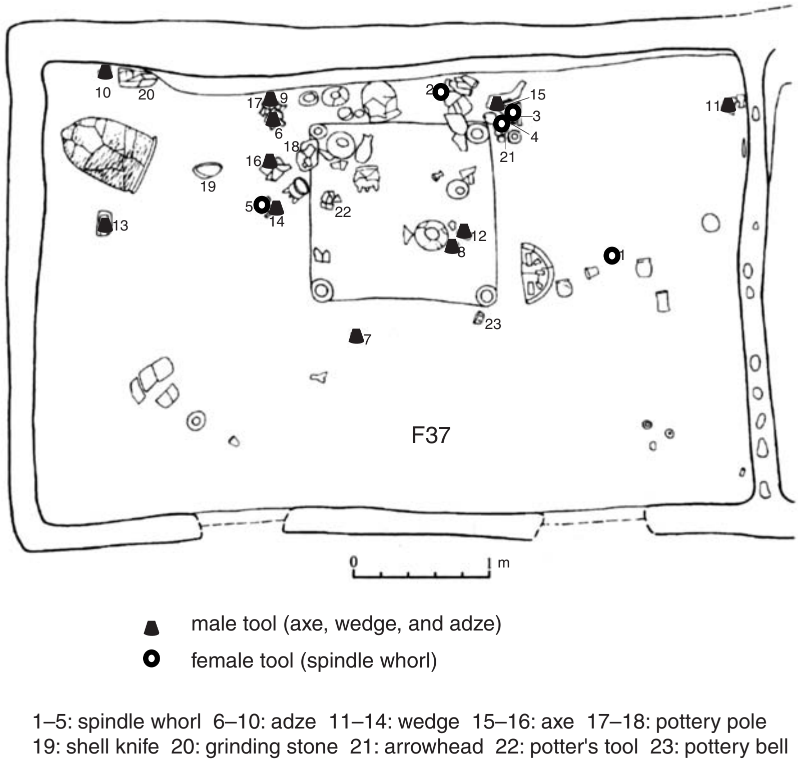


Figure 3.5 The distribution of artifacts in House F37 at Yuchisi in Anhui, late Dawenkou Culture; showing that female tools (spindle whorls) were mainly concentrated on the right-hand side of the room (adapted from Institute of Archaeology CASS 2001: fig. 34).

These three examples show a tendency for household activities to become more explicitly segmented in gender and function during the Neolithic period.

Material possessions in the household

In order to investigate the changing patterns of household material possessions through time, I examined 19 well-preserved houses from five sites, dating from the Yangshao to the Longshan period (ca. 5000–2000 BC). These include Jiangzhai in Shaanxi (Xi'an Banpo Museum *et al.* 1988), Dahecun in Henan (Zhengzhou Institute 2001), Huanglianshu in Henan (Henan Archaeology Team 1990), Yuchisi in Anhui (Institute of Archaeology 2001), and Yinjiacheng in Shandong (Shandong University 1990). These houses contained the most abundant artifacts at these sites, likely representing the households that had the most possessions in their communities. The results clearly show that household material possessions increased in quantity throughout Neolithic times. For example, the "richest" house (F42) at Jiangzhai of the Yangshao culture had 23 artifacts, while the "wealthiest" house (F204) at Yinjiacheng of the Longshan culture possessed 91 artifacts. The average numbers of household artifacts from these five sites also show a trend of gradual increase from 17.8 to 66.5 (Appendix 2.1). This change indicates the development of social complexity during the Neolithic period based on Kent's model, a situation consistent with burial data which suggest an increasing division of labor based on gender, as discussed above. However, we still need to understand the dynamics underlying this trend of growth in material goods.

Hypothetically, three conditions may stimulate the quantity of house material goods to increase. First, growing families would require larger houses and more utilitarian items to facilitate the greater needs of the family members. If this were the case, we would expect to see a correlation between the size of houses and the number of utilitarian goods (tools and food vessels) through time. Second, specialized craft production associated with a high level of division of labor would require increased numbers of specialized tools, and the household might store raw materials and products. In this situation, we would expect to see that large proportions of household artifacts are tools, raw materials, and semi-finished or finished products (Costin 1991: 18–43). Third, hosting frequent feasts would require the household to possess enough food vessels to facilitate such events (more discussion below). In this situation a high frequency of household items should be cooking, serving, and drinking vessels (Hayden 2001a: 47).

To test the family-size hypothesis, I examine the correlation between the size of houses and the number of total artifacts from the house samples. The result shows a very weak correlation between the two variables on the plot, with an extremely low *coefficient of determination* ($R^2 = 0.12379$) (Figure 3.6A). Although there is a general increase in the house size through time, as indicated by the average sizes of smaller early Yangshao houses and bigger late Neolithic houses (Appendix 2.1), this trend has little correlation with dramatically increased frequencies of household items. Therefore, the family size was not an important factor in this aspect of the cultural change.

The craft-production hypothesis may be partially supported by the relatively stronger correlation between the total number of household artifacts and the number of tools ($R^2 = 0.559186$). The plot shows that the majority of samples are scattered on the lower left corner of the plot, while three samples (F33, 37 from Yuchisi and F204 from Yinjiacheng) associated with high frequencies of tools stand out on the upper right corner (Figure 3.6B). It is especially interesting that all of these three tool-rich houses have potter's tools (Appendix 2.1). This pattern suggests that while toolkits used by most households changed little throughout the Neolithic period, some households may have become wealthier than others because of their skills in craft production (such as pottery making) in the late Neolithic.

The feasting hypothesis seems to be positively supported by the very strong correlation between the total number of artifacts and the number of food vessels ($R^2 = 0.954133$), shown in the linear distribution on the plot (Figure 3.6C). This point is discussed in the next section.

Household ritual feasting

Feasting is a particular form of ritual activity constituted by the communal consumption of food and/or drink (Dietler and Hayden 2001b: 3). As a strategy of

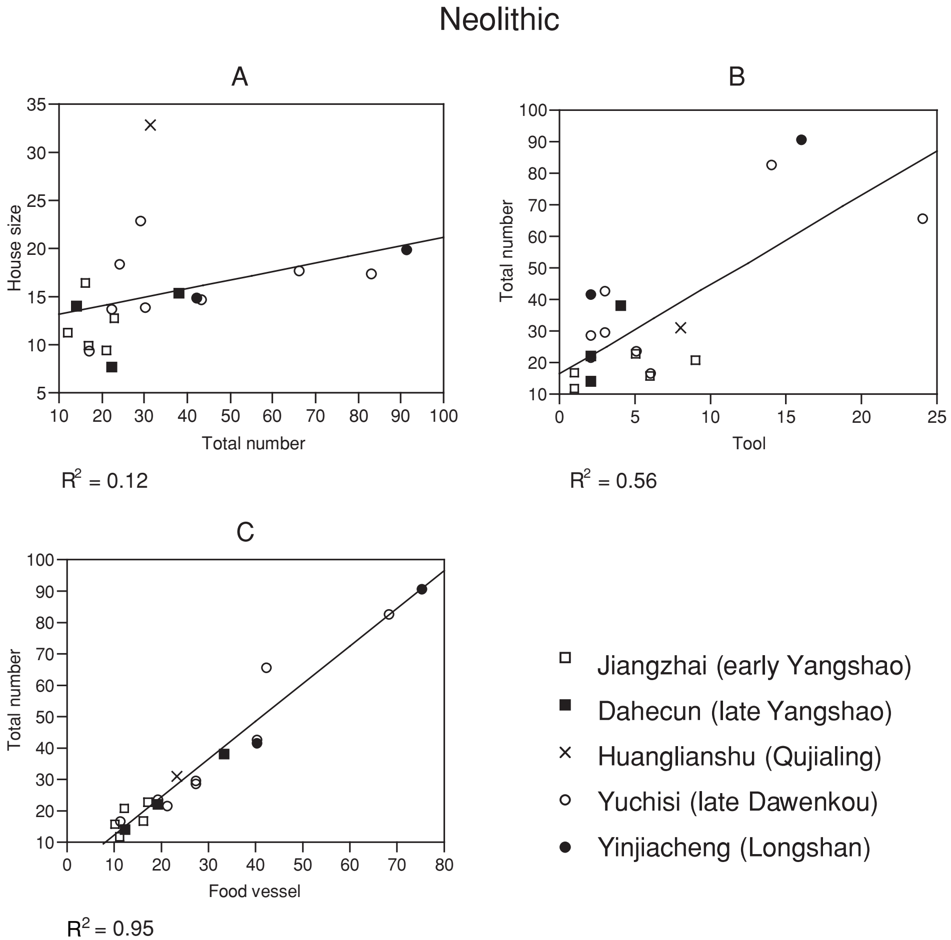


Figure 3.6 Food vessels rather than tools or sizes of houses are the primary factor affecting increased numbers of household artifacts during the Neolithic period. A: very weak correlation between the room size and the number of artifacts; B: weak correlation between the number of artifacts and the number of tools from houses; C: strong correlation between the number of artifacts and the number of food vessels.

competition for power, many feasts were held by the elite in order to attract followers, form alliances, and obtain prestige in local and regional social settings (e.g., Clark and Blake 1994; D'Altroy 1994: 140–141; Junker 2001; Kelly 2001; Pohl and Pohl 1994: 174–177).

Such social behavior occurred in many complex societies across the world (Dietler and Hayden 2001a). Its basic function is to create or maintain important social relationships. Among its many benefits to the hosts, feasting can mobilize labor, create cooperative relationships within and between social groups, invest surpluses and generate profits, create political power, and provide links to the gods or ancestors that can be used to define the structure of relations between social groups (Dietler 2001; Hayden 2001a: 29–30).

The benefits from feasting may be grouped into two main divisions: on the one hand, there are alliance and cooperation feasts; on the other hand, there are economic feasts for competing for status or for gaining political positions (Hayden 2001a: 37–38). However, these distinctions are more for analytical purposes than as rigidly separated practices in reality.

China has a long cultural tradition which emphasizes food; feasting at all social levels has constituted an important mechanism in Chinese societies throughout history (Cooper 1982; Underhill 2002: 67–88). In the historical period, ritual feasts were part of elite life, and scenes of such activities have been depicted on Eastern Zhou bronzes (Chang 1990: 53–56; Ma 1961). Feasting scenes were also depicted on bronze drums, which are often associated with large bronze *fu* cooking vessels in the archaeological context widespread over southern China and southeastern Asia. Ethnographic records also indicate the existence of feasting in some ethnic groups in southern China, and ritual performance was often involved on such occasions (Wang Ningsheng 1989b).

Several scholars have also studied mortuary ritual involving feasting in Neolithic and Bronze Age China (e.g., Fung 2000; Keightley 1985; Liu, L. 1996a; Underhill 2002). However, there is a lack of research strategies on household feasting in residential areas. Such study requires contextual information on faunal, botanic, ceramic, and structural remains from excavation records. Unfortunately most Chinese archaeological reports on faunal remains are limited to taxonomic identifications, and ceramic studies are focused on typology and chronology. There is a great need to develop some method to investigate feasting activities in residential contexts.

Ritual feasts have been successfully identified by materials found in archaeological contexts in many areas in the world, based on observations of non-random patterns of ceramic and faunal remains near public architectures or elite residences (e.g., Junker 2001; Kelly 2001). Feasts at the household level, which show social alliances and cooperation, have also been observed in both ethnographic and archaeological records. According to these studies, occurrence of frequent large-scale feasts hosted by elite households may be archaeologically inferred from the large numbers and sizes of food-preparing and serving vessels kept inside the house, construction of temporary kitchens near the house, and faunal remains with particular discard patterns, such as large portions of the skeletons of animals deposited all in one dump near the house (Brown 2001; Clarke 2001: 158–162; Hayden 2001a: 47–48). These propositions are used here as working models to examine several Neolithic houses which had high frequencies of artifacts, in order to understand the development of household feasting activities in Neolithic China.

Case studies

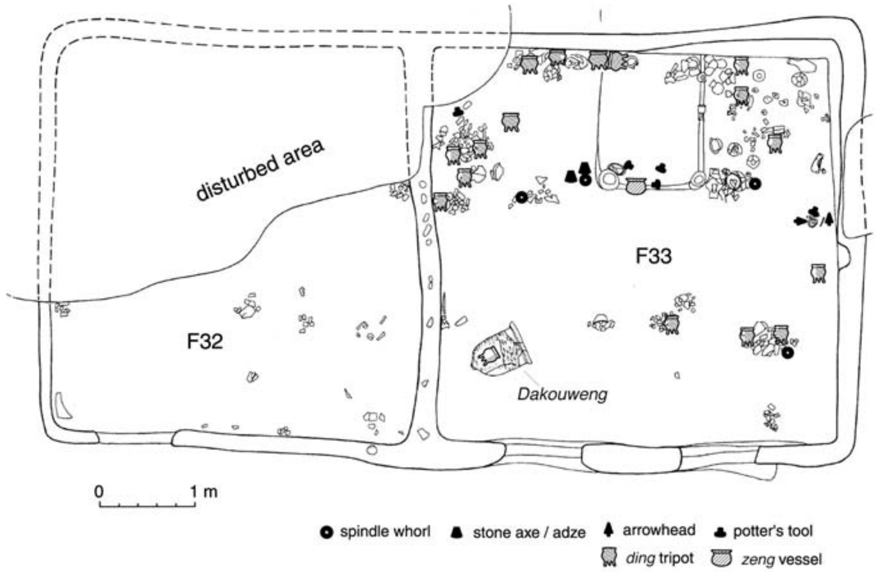
We first start with the early Yangshao culture remains at Jiangzhai, which probably represents a relatively egalitarian social organization, as discussed above. If feasting was a social behavior more likely practiced in transegalitarian and more complex societies, we would not expect to see extremely large assemblages of ceramic vessels kept in any early Yangshao household. There are 120 buildings dated to the Banpo phase at Jiangzhai, but in most cases few, if any, artifacts were found on house floors. Only 20 buildings contained ceramic vessels, ranging from 1 to 23 (Xi'an Banpo Museum *et al.* 1988: 358–369). The vessel types included cooking, serving, and storage, and none of the houses had more than 6 sandy-paste *guan* pots which were probably used for cooking (Appendix 2.1). This pattern seems to support the proposition that no household had facilities to host feasts for a large number of people.

Our second example is from Yuchisi in Anhui, dating to the late Dawenkou period (Institute of Archaeology 2001), as briefly mentioned above. More than 50 buildings were arranged in rows and clustered into 9 groups in this settlement (Figure 4.13). Each group had at least 1 building which contained an outstanding number of food vessels (see chapter 4). House F33 (17.43 m^2 in size) yielded 68 food vessels for cooking, serving, drinking, and storage, and a tool assemblage (15 tools) consisted of both men's and women's tools. The presence of 4 potter's tools (*taopai*) indicates that pottery making was a part of household production (Figure 3.7). The coexistence of both kinds of tools with the whole set of ceramic utensils in this building implies that it was occupied by a family.

The large number of food vessels is apparently beyond the daily use of one family. Among these vessels there are 20 cooking wares composed of three types: 18 *ding* cauldrons, 1 *zeng* steamer, and 1 *dakouweng* (or *dakouzun*) large-orifice urn (Figure 3.7). This inventory of cooking facilities is also rare in terms of the vessel type, in particular the *dakouweng*.

Dakouweng are the largest vessels but they occurred in low frequency in Dawenkou sites, and may have had special functions since some of them bear pictographic symbols. According to a recent study on the provenance of the *dakouweng* vessels from Yuchisi and Lingyanghe in Juxian, Shandong, the mineral composition of one Yuchisi specimen falls into the range of the Lingyanghe samples (Xu Anwu *et al.* 2000). The latter is more than 300 km northeast of the former (Figure 3.1). The implication of this result is unclear, but it may suggest that some special function of this vessel type connected Yuchisi with distant regions. Only 5 such vessels, measuring 30.5 to 45 cm in rim diameter and 60 to 65 cm in height, were unearthed from Yuchisi buildings. The example found in F33 contained a *ding* cauldron with burnt animal bones, and one found at Juxian in Shandong had a thick line of ash on its interior surface (Fang 1998: 42). These phenomena suggest that *dakouweng* were probably used for making special food at particular events. House F33, therefore, seems to possess a ceramic assemblage facilitating frequent feasts. Since F33 is not the only house which yielded a large quantity of food vessels, it is likely that a number of kin-groups in this community were involved with competitive feasting (see further discussion in chapter 4).

The third example is from Yinjiacheng in Sishui, Shandong, dating to the late Longshan period (Shandong University 1990). Eight semi-subterranean square-shaped houses, belonging to the second phase of the site, have been unearthed. Most of the houses were covered with large amounts of burned clay, probably the remains of collapsed roofs and walls. Many ceramic vessels and tools, and sometimes



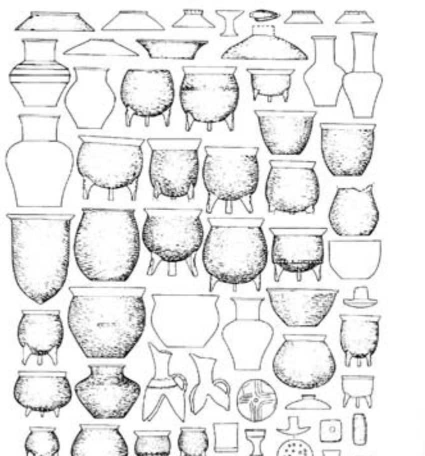


Figure 3.7 Location of artifacts on the floor of House F33 (upper) and ceramic vessel types from it (lower) (incomplete assemblage, and not to scale), at Yuchisi in Mengcheng, Anhui, the late Dawenkou culture (adapted from Institute of Archaeology CASS 2001: figs. 30, 68).

incomplete human skeletons, were found on the floors. House F204 (20 m^2 in estimated size), for example, contained 2 incomplete skeletons of children and 91 artifacts, including 76 pottery vessels and 15 tools (Figure 3.8). Most of the tools appear clustered into two groups lying on the northwestern and southwestern parts of the floor, including adze, chisel, arrowhead, potter's tool, and spindle whorl.

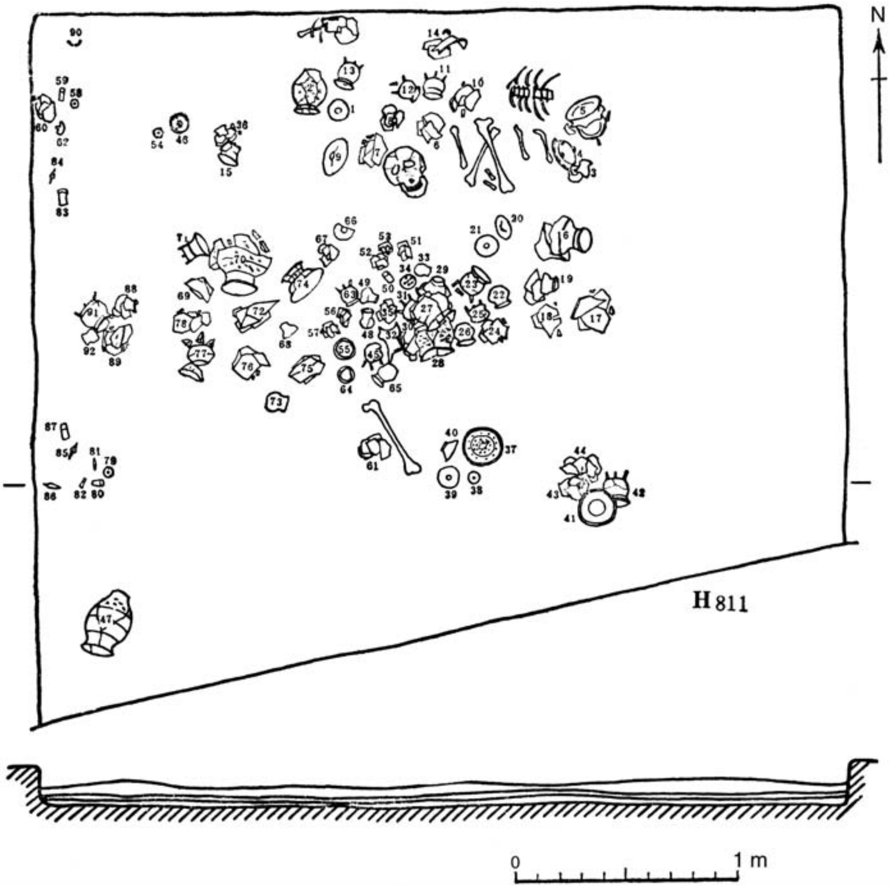


Figure 3.8 Plan of House F204 with artifacts and human skeletons found *in situ* on the living floor at Yinjiacheng, Longshan culture. The northern cluster of tools includes 2 stone adzes, 2 spindle whorls, 1 arrowhead, and 1 potter's tool; the southern cluster includes 2 stone adzes, 1 chisel, 3 arrowheads, and 1 spindle whorl; and a stone adze and a spindle whorl were found near the center of the room. The pottery vessels include 12 cauldrons, 1 steamer, 31 pots, 2 jars, 1 urn, 4 plates, 2 vessels, 1 pitcher, 2 goblets, 2 grates, 8 lids, and 10 broken vessels (adapted from Shandong University 1990: fig. 0.12A).

Based on the mortuary data from this site, which suggest the arrowhead as a male tool and the spindle whorl as a female tool (Appendix 1.6) (Shandong University 1990: 316–322), the tools in each of these two clusters of house F204 appear to be both men's and women's tools. Similar to F33 at Yuchisi, this house also had a potter's tool (*taopai*), indicating that the members of this household manufactured pottery.

The 76 pottery vessels included types which were used for cooking, serving, and storage. There were 13 cooking vessels, including 12 *ding* cauldrons and 1 *xian* steamer. Similar to house F33 at Yuchisi, the material remains suggest that a family occupied F204, but its ceramic inventory exceeded the daily needs of the family. The quantities of vessels found in each of the well-preserved residential buildings at the site vary significantly (from 20 to 76), and F204 had the highest frequency of food vessels. It is probable that this building represents an elite household which hosted frequent feasts.

These case studies show clear evidence for the development of feasting activities during the Neolithic period. As in many complex societies in other parts of the world, feasting was a major mechanism for conducting social relations and providing opportunities for individuals to negotiate prestige and social status in Neolithic China. Such behavior may have become intensified towards the late Neolithic period, as exemplified by the increased food vessels possessed by households at some Dawenkou and Longshan sites. This observation is consistent with the mortuary data which show increased competition in funerary feasting in the Dawenkou and Longshan cultures (Fung 2000; Underhill 2002). It is interesting to note that the two material-rich households from Yuchisi and Yinjiacheng all yielded potter's tools, raising questions about the relationship between elite households and craft production. This issue will be discussed in chapter 4.

Human sacrifice

Human sacrifice has been practiced in many complex societies worldwide. Examples from ancient Mesoamerica particularly demonstrate that such practice was closely associated with warfare and political dynamics (Boone 1984). As revealed in both the archaeological record and oracle-bone inscriptions, the Shang royal court also conducted human sacrifice (Huang Zhanyue 1990), which served as a strong mechanism for the Shang rulers to claim legitimacy and maintain their power base (Shelach 1996). This tradition appears to have developed in the middle Neolithic period, coinciding with the emergent complex society.

Throughout the early Neolithic period, in the middle and lower Yellow River valley a majority of the dead were buried in cemeteries. Burials of some skeletons in ash pits in residential or non-cemetery areas, although very rare, began to occur in the Yangshao period. In the early Yangshao period, at the Banpo site in Xi'an, Shaanxi, two skeletons in flexed position were found in two ash pits in a residential area, while most burials were found in the cemetery (Institute of Archaeology 1963: 198–205). In the middle Yangshao period, 5 skeletons, 4 of which were incomplete, were found in 4 ash pits at Miaodigou in Shanxian, Henan (Institute of Archaeology 1959a: 16). In the late Yangshao period, 3 skeletons in flexed or ventral position were found at the Dahecun site in Zhengzhou, Henan (Zhengzhou City Museum 1979: 341, 354–355). 10 skeletons including children and adults were found in a pit (H57) at the Dianjuntai site in Xingyang, Henan (Zhengzhou City Museum 1982). All were dismembered, and a long bone from skeleton No. 10 seems to have been broken and burned. In the early Longshan period, four skeletons, some dismembered and others with traces of injury, were unearthed from a large pit at the Bancun site in Mianchi, Henan (Jiang 1993).

Such phenomena are seen more frequently at late Longshan sites. At Hougang in Anyang city, Henan (Anyang Team 1985), for instance, 15 house structures were found with 27 human skeletons of children aged one- to five-years-old buried at the bottom of postholes, inside walls, and mostly underneath the house foundations.

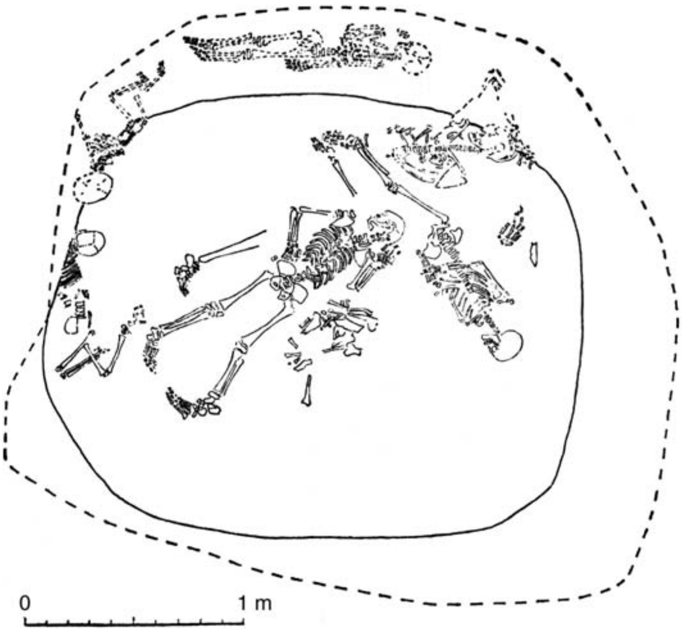


Figure 3.9 Human skeletons found in pit no. 1 at Wangchenggang in Dengfeng, Henan (adapted from Henan Institute 1992a: fig. 21).

The burials under the house walls are aligned with the walls, suggesting that they were involved in the construction of the houses. At Wangyoufang in Henan (Henan Team 1987), 3 children were buried inside the walls of a house and 3 adult males were buried in the northeast corner of another house foundation. The adult skeletons were overlapping, the frontal parts of the three skulls were cut off, and the mandibles of two of the skulls were displaced, indicating some kind of violence leading to death. At Wangchenggang in Dengfeng county, Henan (Henan Institute 1983a, 1992a), human skeletons were found in thirteen pits, which were probably dug for a foundation-laying ritual. In pit no.1, for example, seven human skeletons were found, including three children, two women, and two men (Figure 3.9). At Keshengzhuang, Chang'an county, Shaanxi, nine human skeletons, some of which were dismembered or mixed with animal skeletons, were found in 6 out of 43 ash pits; and these 6 pits are close to houses (Institute of Archaeology 1962: 43–69) (Figure 3.10).

Similar remains have also been found at many other late Longshan sites, such as Wangwan, Cuoli (Luoyang Museum 1978a), Xiaopangou (Luoyang Museum 1978b), all in Henan, Jiangou in Hebei (Handan Archaeology Team 1959), and Bianxianwang in Shandong (Yan 1985).

The burials described above share some common features: (1) the bodies were placed in ash pits in a non-cemetery area; (2) the corpses were often buried in undignified positions, and sometimes dismembered; and (3) in most cases, there were no grave goods. This type of burial occurred as early as the early Yangshao

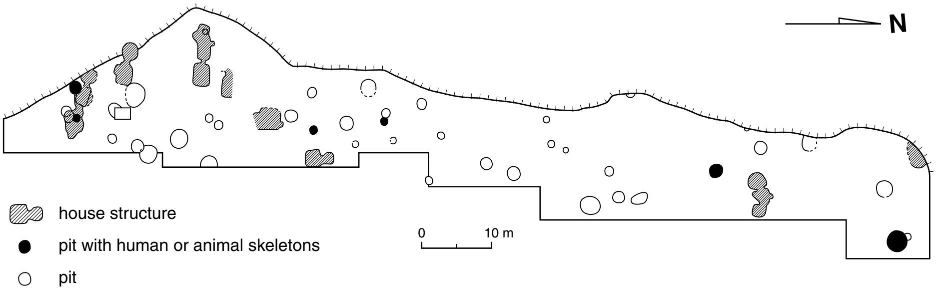


Figure 3.10 Distribution of houses and pits at the Keshengzhuang site, illustrating the proximity of houses and sacrificial pits (adapted from the Institute of Archaeology 1962: fig. 4).

period and gradually became prevalent in the Longshan period. It also became more violent in nature beginning with the late Yangshao period. Many of these cases may have been instances of human sacrifice, which became a tradition most explicitly demonstrated in the Shang dynasty.

Many sacrificial burials have been found near temples and in the royal cemeteries of the late Shang. At least 13,052 people were recorded in oracle-bone inscriptions as having been sacrificed for ritual purposes in the late Shang period (1395–1123 BC) (Hu 1974). According to Shi Zhangru (1959), the process of building ancestral temples at Anyang generally consisted of four stages – foundation-laying, the installation of posts, the installation of doors, and inauguration of the building – and every stage involved ritual, in which animal and human sacrifices were commonly offered.

These rituals, related to laying house foundations and ancestral cults in the dynastic period, probably had indigenous roots in the Neolithic period. The burials found in the Yangshao and Longshan periods, the forms of which are similar to these human sacrifices near buildings in the Shang dynasty, may have been early examples of such practice (Huang Zhanyue 1990, 1996; Li Jianmin 1981; Pu 1987; Wang Kelin 1982).

To sum up, a cross-regional survey of household activities demonstrates a general trend toward social complexity during the Neolithic period. The differences in the use of space, revealed in the Neolithic houses, show increased segmentation in human activity. This change coincides with increased quantities of household material goods. These trends conform to Kent's model regarding the relationship between segmented household activities and social complexity (Kent 1984). The increase of household goods is affected by the rising numbers of food vessels, suggesting that competition for prestige among households operated through frequent feasting activities. The increasing number of ash-pit burials relating to human sacrifice in the late Neolithic period is also consistent with the general trend of growing social stratification. These patterns provide useful background for examining the example of a Longshan culture household from Kangjia, as discussed next.

A household at Kangjia

The Kangjia site in Lintong, Shaanxi, dating to the late Longshan period, was excavated extensively after 1981. It is located in the lower Wei River valley, 4.5 km north

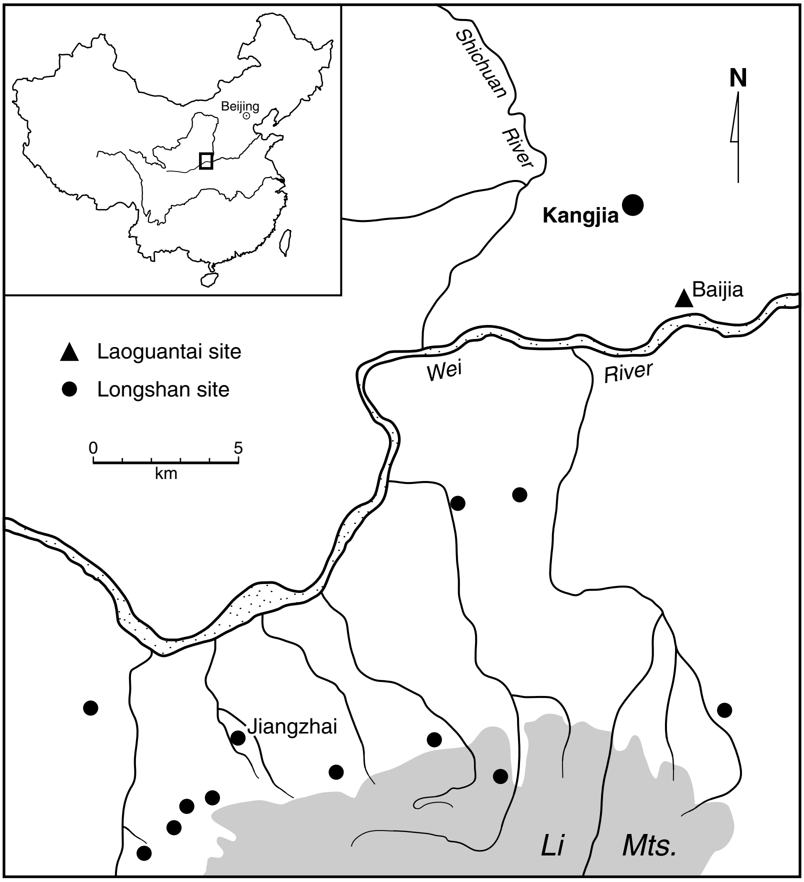


Figure 3.11 Distribution of the major sites in Lintong, Shaanxi, mentioned in chapter 3.

of the Wei River, 4 km east of the Shichuan River, and 20 km north of the Li Mountains. To the east of the site, an ancient river course ran along a north–south axis and was connected with the Wei River to the south (Xi'an Banpo Museum 1985). A total of 13 Longshan sites have been found in the Lintong area, mostly distributed to the south of the Wei River (National Bureau 1999: 73–91) (Figure 3.11).

The site was dated to the Keshengzhuang phases (ca. 2500–2000 BC) (Qin 1995: 254–255). Most excavations were carried out in the southeastern part of the site, where several rows of houses were found. In order to understand the distribution of the houses in another part of the site, a 10 × 10 m unit (T26), south of the center of the site, was excavated in 1990 (Figure 3.12). The data analyzed in this chapter are mainly derived from this excavation unit.

In the Longshan culture strata of T26, 33 house foundations were organized as a multi-house row, and they were stratified into 5 to 10 layers in deposits of some 3 m thick (Figure 3.13). The results of coring tests indicate that no foundations were discovered in the area immediately outside the excavated square, although there were additional house foundations a few meters further away (Figure 3.12).

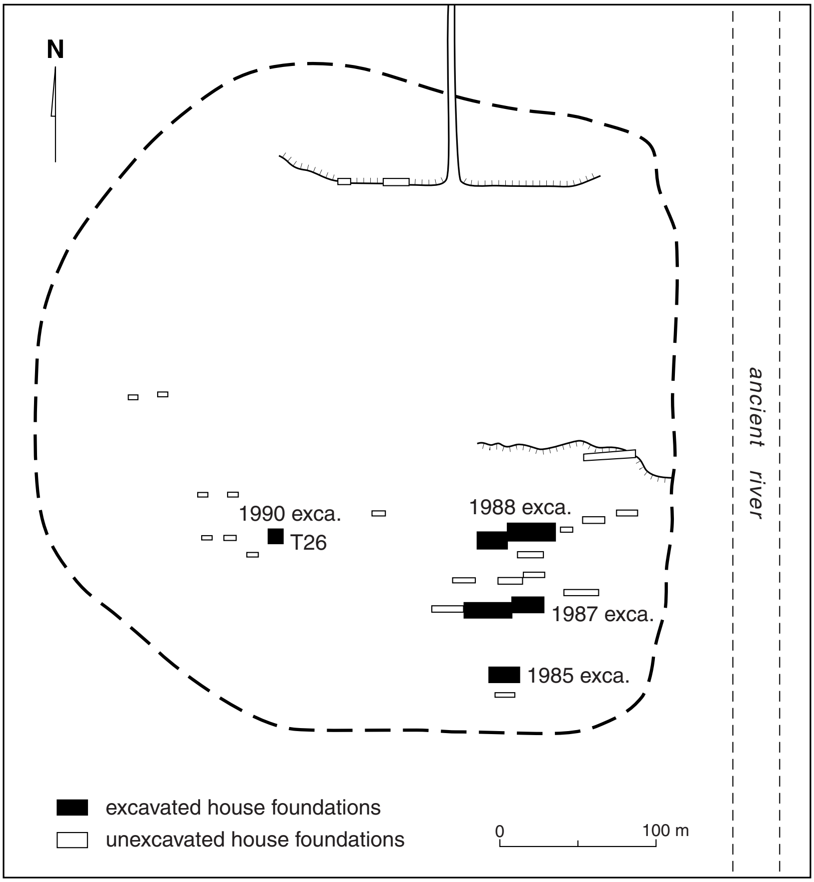


Figure 3.12 Sketch map of the Kangjia site.

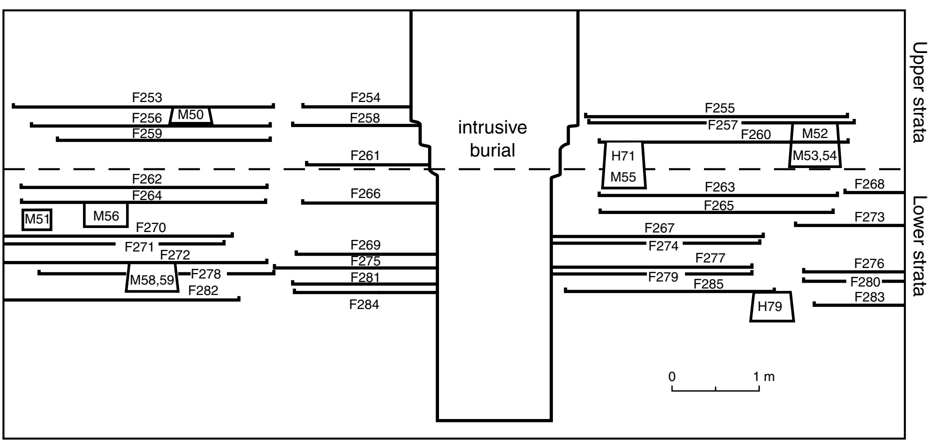


Figure 3.13 Profile of the vertical distribution of house structures at Kangjia, from the 1990 excavation (looking north).

Therefore, this multi-house group forms an independent cluster on two strata, with 4 smaller connected houses in the lower stratum and 3 larger ones in the upper stratum (Figure 3.13).

In addition to house foundations, the excavation yielded 18 pits, 9 human skeletons, a large quantity of pottery sherds, and 158 implements and ornaments made of bone, stone, and pottery. Some floral remains were also recovered, including carbonized millet grains and fruit remains. Regrettably, the ceramic data were not available for this research.

Faunal remains were carefully collected. Sieving was applied to some of the units that contained rich faunal remains, including the entire deposit of one pit and part of the deposits from three pits. A preliminary identification of the entire collection of animal bones was carried out in the field. A total of 3,046 faunal specimens (including fragments) were recorded. They are reported as numbers of identified specimens (NISP), which is preferable to the minimum number of individuals (MNI) for estimating relative abundances of taxa (Crabtree 1990: 159–160; Redding 1992), and is a standard commonly used in zooarchaeological literature in other parts of the world (e.g., Falconer 1995; Meadow and Zeder 1978; Zeder 1991). These specimens include 2,790 mammal, 36 bird and 36 fish bones, 192 freshwater snails and shells, and 1 turtle. Among the mammal bones, 811 specimens can be identified to taxon and element, while others are too fragmentary to be identified more precisely other than by such categories as large, medium, and small mammals. Some 357 specimens, primarily from mammals, were shipped to the Zooarchaeology Laboratory of the Peabody Museum at Harvard University where the detailed identifications were made.

Features: houses, pits and burials[2]

House foundations: The rectilinear houses were built of rammed earth. Each was about 3 × 4 m in area, and opened onto a courtyard. Among 33 house foundations (F253–F285), most had lime-covered floors, but no regular pattern in terms of function or structure can be discerned in the distribution of either lime-surfaced or plain earthen floors. The multi-layered foundations are the result of periodic rebuilding of the houses over a long period of time. Since several layers of foundation are superimposed with little disjunction and the style of architecture did not change, one can conclude that there was long-lasting stability at the Kangjia village in the Longshan period. Very few artifacts and animal bones remained on the floors, as the old houses were probably cleaned out before rebuilding. Each house had at least one round hearth (about 1 m in diameter), which was usually located in the center of the house floor, and a pottery vessel, perhaps for saving kindling, was often found inside a hearth (Figure 3.14); occasionally an extra hearth was found in a corner of a house. In three cases, remains of paintings done with red pigment, probably images of animals, were found on the lime floors (Figure 3.15). The last feature is unique since it has not been seen in other parts of the site.

Common walls between two houses were often found to extend into the courtyard, dividing it into sections, thus providing a small separate attached space outside each

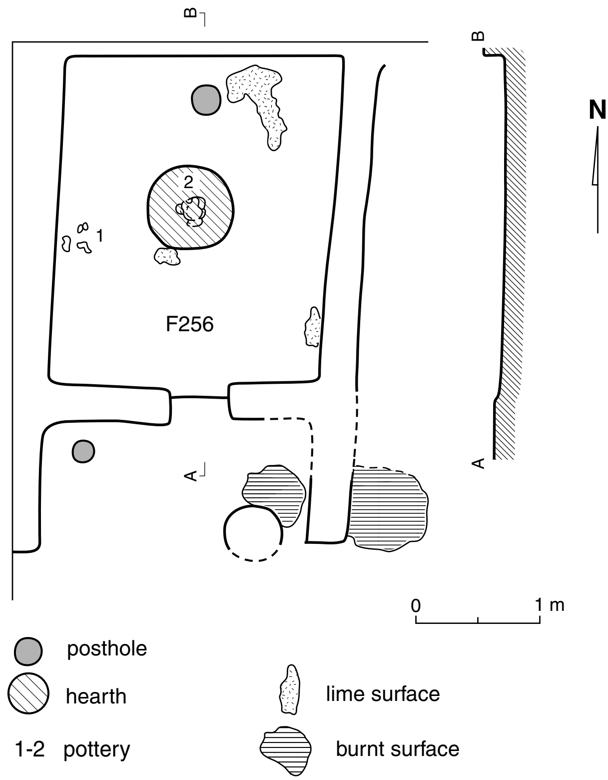


Figure 3.14 Example of the basic house structure at Kangjia.

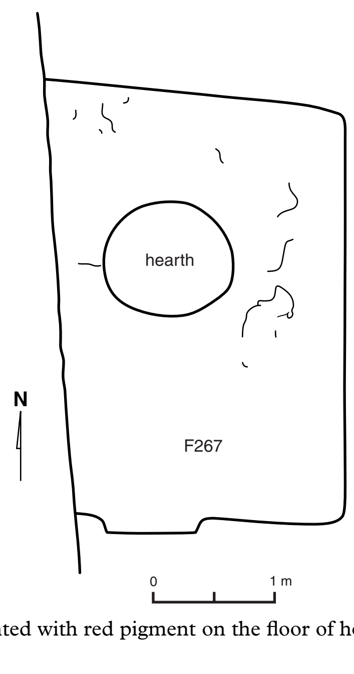


Figure 3.15 Animal images painted with red pigment on the floor of house F267 at Kangjia.

house. The lower exterior surface of these extended walls and the ground next to the wall were sometimes heavily burned, indicating that outdoor cooking activities probably took place there. Within the rammed earth, of which most walls were constructed, animal bones and pottery sherds were found, often in clusters. Some phalanges appear to have been articulated, suggesting that these bones were buried within a short time period after the meat was consumed. These bones and sherds therefore were probably the remains of feasting or sacrificial offerings associated with the construction process (see below). In two cases (F264 and F272), human burials were found under the wall and house floors (Figures 3.18 & 3.19).

The cross-regional study of grave goods and domestic activity areas presented above indicates that increased division of labor based on gender formed the basic economic pattern in the late Neolithic period; a single residential unit, including one or two connected rooms with one hearth for cooking and whole sets of domestic vessels and tool kits, may have been occupied by a nuclear family. This suggests that the house units at Kangjia, which normally included a hearth probably for cooking, most likely provided the residential support for a nuclear family; while a house group, which was a multi-roomed dwelling, may have consisted of several such families that were kin-related and formed an extended family group as the basic economic unit.

Pits: The 18 pits (H67–H84), containing various amounts of animal bones and pottery sherds, were primarily distributed in the front courtyards of the houses. Many pits were once storage facilities as indicated by carbonized millet grains found in the bottom of pits H68 and H70. In two pits (H69, H71) human skeletons were unearthed, suggesting that some pits were made for mortuary purposes. Faunal remains from some pits reveal non-random patterns, suggesting ritual feasting (see below).

Burials: Nine skeletons (M50, M52–M59) were found in the Longshan deposits. 5 of them were in the open courtyards, and 4 within the house foundations. From courtyards, 1 adult female (M50) was found either on the floor of an abandoned house or on the bottom of a pit (which was badly disturbed by deposits from the Han dynasty) in the southwestern part of the square, situated in the uppermost level of the Longshan deposit. Pit H69 (diameter 2 m, depth 0.9 m), located in the southeastern part of the square, contained 2 skeletons of sub-adult females (M53, 54) at the bottom level (Figure 3.16). The spine of M53 was flexed, which may suggest unnatural death of some kind or movement after burial. About 60 cm above the skeletons an oracle bone made from the scapula of a water deer was uncovered (Figure 3.17A), indicating that divination may have taken place during the burial process. An incomplete female adult skeleton (M52) was later buried in the upper level of pit H69.

A female twenty to twenty-five years old (M55) was buried at the bottom of pit H71 (Figure 3.16). The skeleton was dismembered – the humerus, ulna, and fibula on the right side were displaced near the skeleton, and the right tibia, radius, and foot bones were found throughout the entire deposit vertically. Pit H71 is slightly earlier than pit H69, and is located in front of house F260 about 1 m away from

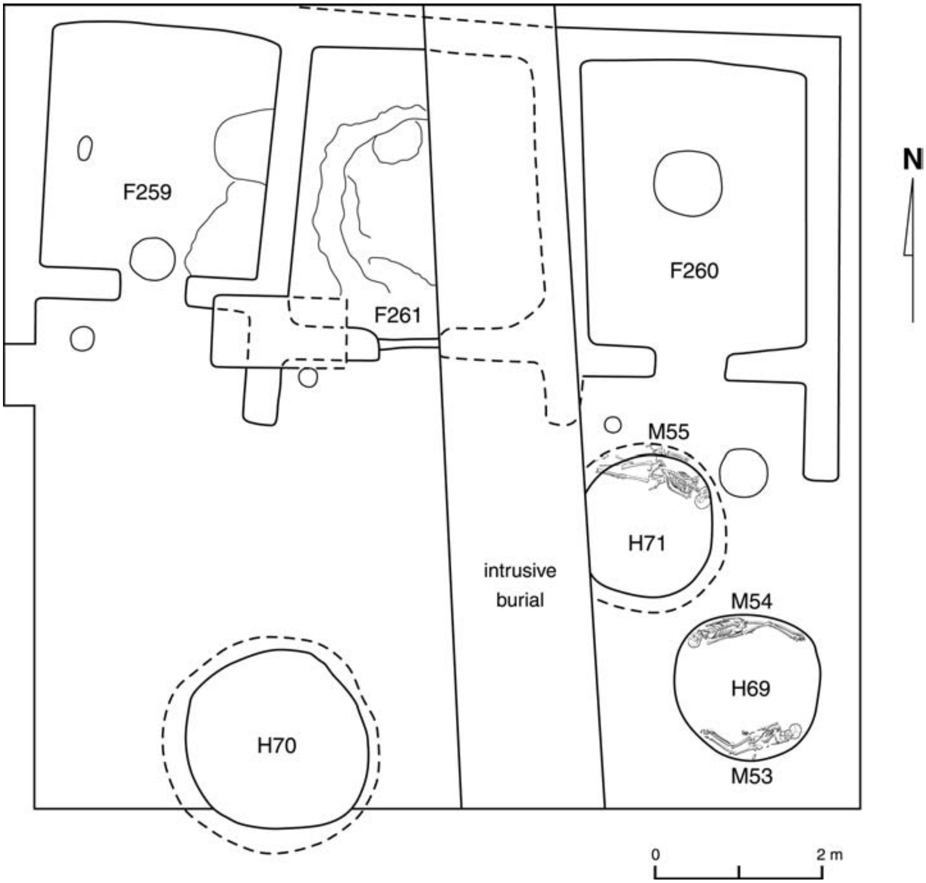


Figure 3.16 Burials M53 and M54 in pit H69, and burial M55 in pit H71 at Kangjia.

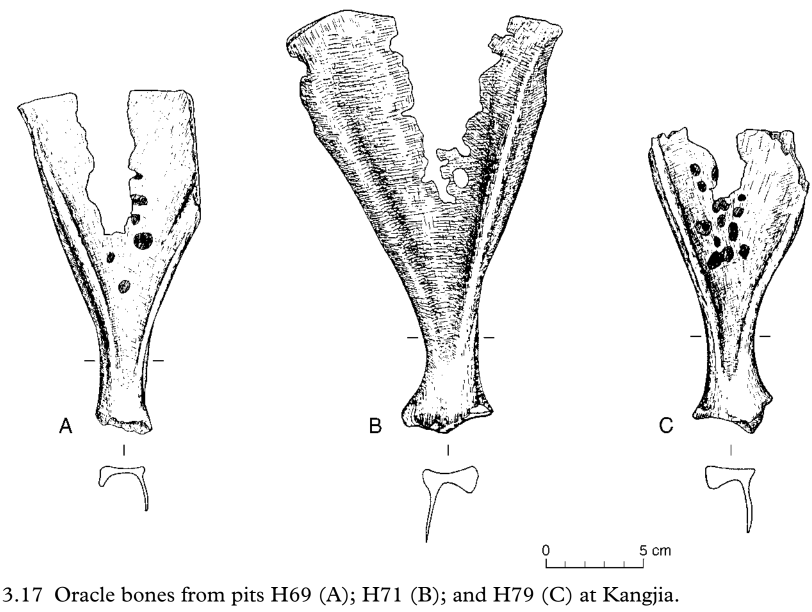


Figure 3.17 Oracle bones from pits H69 (A); H71 (B); and H79 (C) at Kangjia.

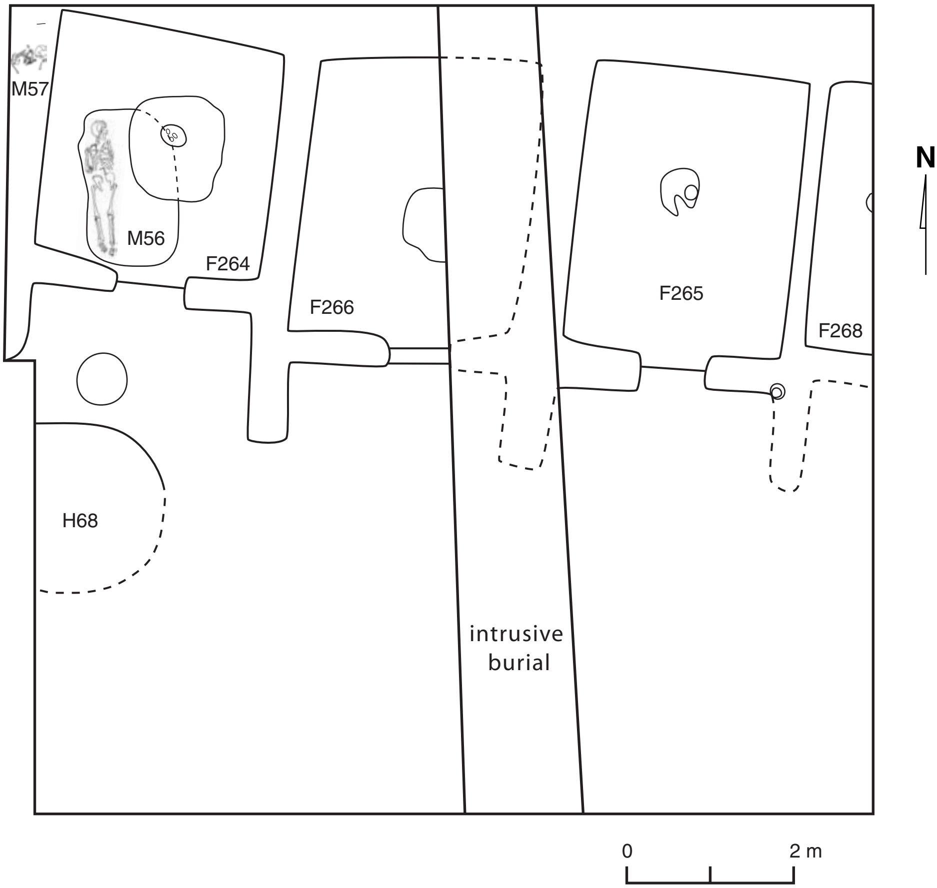


Figure 3.18 Burials M56 and M57 found under the foundations of house F264 at Kangjia.

the door of the house. This pit is rather shallow (0.9 m) compared to most pits found at the site (more than 1.5 m deep on average); an oracle bone, made of a sika deer scapula, was also found in the pit (Figure 3.17B), 60 cm above the skeleton. Many carbonized kernels of mountain apricot (*Armeniaca culgaris lam*. var. *ansu*) and shiny-leaved yellowhorn (*Xanthoceras sorbifolia bunge*) were found throughout the entire deposit of pit H71, indicating that it was filled during a very short time period in early autumn when these fruits were ripe. This suggests that pit H71 was intentionally made for the burial or for some purpose other than for storage or refuse.

The incomplete skeleton of a child (M57) was found under the northeastern corner of the wall of house F264. Under the same house foundation an adult male (M56) was also buried face down in a rectangular pit with one arm flexed under the body (Figure 3.18). The corpse appears to have been placed on the concave floor of the pit when the body was not stiff. The face-down posture is somewhat unusual compared to ordinary burials found in most Longshan cemeteries, where skeletons are extended and face up.

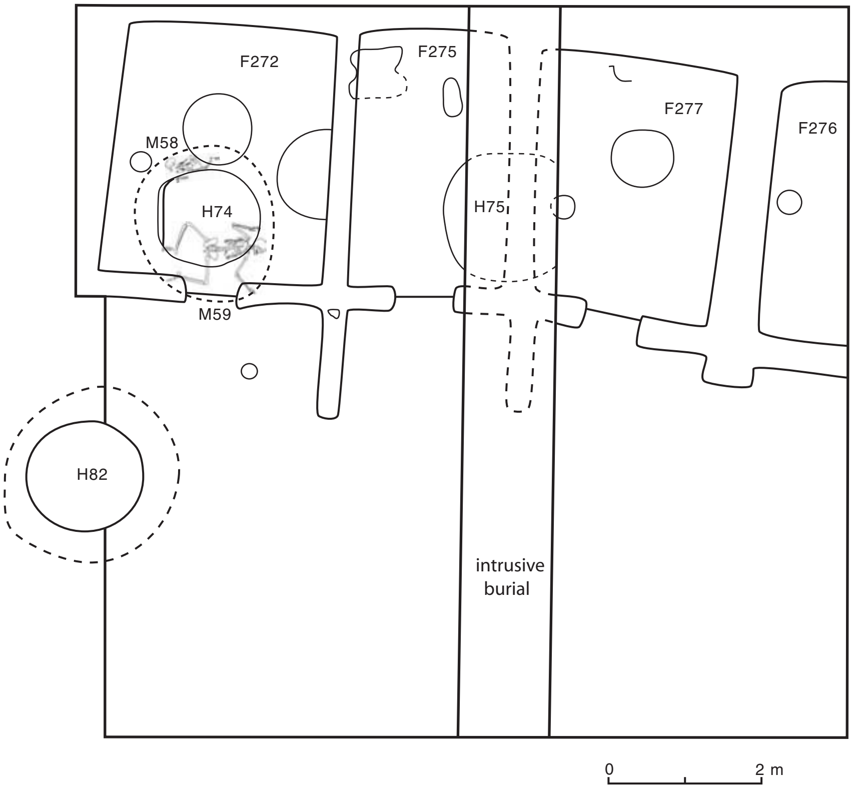


Figure 3.19 Burials M58 and M59 found in Pit H74 under the floor of house F272 at Kangjia.

2 human skeletons, an adult male (M59) and a child (M58), were discovered in pit H74 underneath the floor of house F272 (Figure 3.19). The adult skeleton was found sprawled on its back with arms and legs splayed out. Such undignified postures suggest that death was probably caused by some unnatural agency.

T26 is not the only area at the site where the dead were buried near houses. 13 human skeletons, including 6 children and 7 adults, were also found near house foundations in previous excavations at Kangjia (Kangjia Team 1988, 1992; Xi'an Banpo Museum 1985). Among them, 3 adults, 1 in a ventral position and 1 in a flexed position, were found in the cultural deposits without any clear indication of grave pits; and 2 adults were found on the bottoms of 2 ash pits.

Children placed in funeral urns and buried near house foundations have been found in the Yangshao culture as a normal mortuary practice (for example, at the Banpo site) (Institute of Archaeology 1963). It is possible that the Longshan people at Kangjia also customarily buried children near houses. Some of the child burials found at Kangjia may belong to this category.

The seven burials (M52–56, 58, 59), however, suggest a special type of mortuary practice. They are characterized by (1) the corpse being placed either in a pit in a courtyard or under a house foundation instead of being buried in a rectangular tomb in a cemetery. (2) Some of the deaths appear to have been caused by unnatural agency, as the bodies were evidently treated disrespectfully. And (3) the burials were often not placed in an extended supine position which was the common practice at that time. These burials may have been human sacrificial victims.

Artifacts

158 implements and ornaments were discovered in the T26, including 108 (68.4 percent) made of bone, 30 (21.5 percent) of stone, and the rest (10 percent) of ceramic, antler, jade (nephrite), shell, and tooth. In addition, some small fragments of red lacquer, among the earliest lacquer remains discovered in the Shaanxi region, were found in cultural deposits, although the form of the artifact could not be identified.

Many bone tools were made from long bones of deer and sheep/goat, all available locally. Whetstones and the distal part of a deer's metacarpal, bearing marks of sawing and found in the house compound, also indicate that some of the processes involved in manufacturing and resharpening bone tools were carried out within the household. Many bone tools, such as awls and spatulas, are not standardized in size and form, and were roughly made. These may indicate the absence of craft specialization in making these tools, and that the tasks for which these tools were used varied widely.

The stone tools and ornaments were made of twelve types of lithic materials which are available in the Li Mountains, more than 20 km to the south of Kangjia (Figure 3.11). Since no evidence for stone-tool manufacture has been found at Kangjia, it is likely that those tools were obtained from other locations through trade. These stone tools are also more regular in form than the bone tools, suggesting that specialized craftsmen near lithic sources may have made them.

Faunal remains

The faunal assemblage from T26 available for this study is the main source for a systematic analysis. The 357 faunal specimens, which are subjected to detailed analysis, include nearly complete collections of faunal remains (cranial and long bones) from 2 pits (H71, H77) and 1 house (F264), 50 percent of the collection (mostly cranial) from pit H79, and incomplete collections (mostly cranial) from 14 houses, 11 pits, and various cultural deposits.[3] Since the faunal remains from the four units (H71, H77, H79, F264) yield the most important information, that portion of the material collected from these units, which is not available for detailed analysis but was documented in the preliminary records, is also included in this study. These two sets of information, forming the main body of the data, are referred to as "the primary data" in the following pages. The preliminary records of the entire collection are also considered in the analysis when appropriate. The greater part of the bones identifiable to taxon in the primary data is from mammals (NISP = 349) and constitutes a significant percentage (43 percent) of the entire mammal assemblage from T26 (NISP = 811) which have been identified to taxon and element.

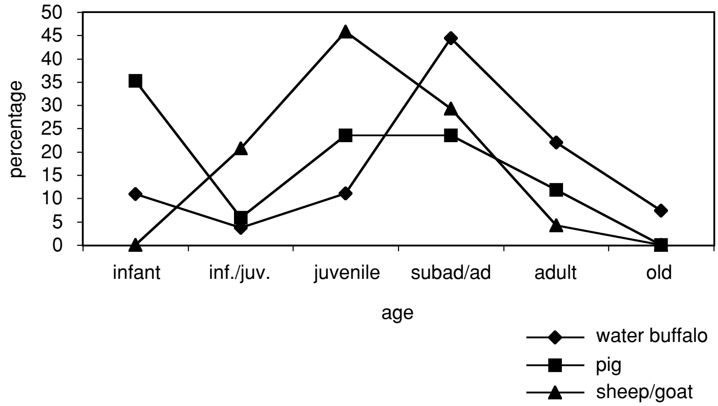


Figure 3.20 Comparison of age profiles among water buffalo, pig, and sheep/goat bones from Kangjia.

Therefore, the primary faunal data used as a sample for the following analysis is representative.

28 taxa have been identified from the entire collection of excavated bones. The most frequently occurring mammal bones in the primary data are those of sika, water buffalo, pig, sheep or goat, raccoon dog, dog, water deer, and hare. Remains of freshwater snails and shells are quite abundant, while carp, catfish, turtle, and wild birds such as pheasants, crows, and swans have also been found at the site occasionally. Chicken bones are rarely present, as are those of carnivores such as bear, tiger, fox, and cat. Remains of the bamboo rat have also been found. The bones of some animals, such as rats, may not be archaeological but intrusive from a later period.

Faunal remains from Kangjia can be divided into two categories: domesticated and wild. The determination of these animals' age at death is based on tooth eruption and epiphyseal closure (Bokonyi 1972; Silver 1969).

Domesticated animals The pig is the most frequently occurring domesticated animal at T26. Among 17 bones of pigs whose age at death can be determined, 64.7 percent are juvenile and younger (<30 months) and 88.2 percent died before reaching sub-adult (<42 months) (Figure 3.20). The age composition suggests a kill-off pattern for domestic animals, corresponding to the owners' calculations for obtaining the maximum return of carcass weight on feed (Davis 1987: 150). The high mortality rate of infants (35.3 percent) suggests that pig husbandry was somewhat difficult.

Sheep/goats, as newly introduced animals in the Longshan period, are the second most frequently occurring domesticated animal at T26. Among 24 ageable bones, 66.7 percent are juvenile and younger (<30 months), and 95.8 percent died before reaching sub-adult (<42 months) (Figure 3.20). Most sheep/goats were killed at a young age, in a fashion similar to pigs, but the absence of infant bones indicates a better survival rate than that of the pig.

The earliest remains of domesticated sheep/goat, in China, dated to the fourth millennium BC, have been found in areas to the west and north of the Central Plains. These include sites of the Hongshan culture in northeastern China, and Majiawan in Yongjing, and Majiayao in Lintao, both in Gansu province (Zhou 1984). Sheep/goats did not occur in the middle and lower Yellow River valley until the early Longshan period, represented by goat remains (*Capra hircus*) found at Miaodigou in Sanmenxia, western Henan, dated to about 2800 BC (Institute of Archaeology 1959a: 82; Zhou 1984). During the late Longshan period, sheep and goats appear to have become more widespread, and their remains have been unearthed from at least six sites, including Kangjia, in this region. These examples from Longshan sites include *Ovis shangi* bones found at Chengziyai in Zhangqiu, Shandong (Zhou 1984), sheep/goat remains at Dongxiafeng in Xiaxian, Shanxi (Dongxiafeng Team 1983), *Ovis* sp. at Yangzhuang in Zhumadian, Henan (Peking University 1998) and Zhukaigou in Inner Mongolia (Huang Yunping 1996), and *Capra hircus* L. bones at Baiying in Tangyin, Henan (Zhou 1983). The considerable number of sheep/goat bones discovered at Kangjia is consistent with this pattern, indicating that the herding of sheep/goats began to play an important role in the subsistence economy of some late Longshan settlements.

Dog-bone remains are rather fragmentary and mixed with other animal bones in the debris, and the age at death as indicated by ageable specimens is rather young. In pit H71, about 42 percent of the dog bones were broken into fragments of a size one-quarter or less of the length of the whole bone. Therefore, we can conclude that dogs were probably eaten.

Very few bones have been identified as probably being from chicken. Among several Longshan sites along the Wei River valley, only at one early Longshan site, Anban in Fufeng, have two possible chicken bones been reported (Fu 1988). Therefore, it is likely that chicken was not important in the regular diet of Longshan people in the Wei River valley.

Wild animals Wild mammals occurring at Kangjia include sika deer, water buffalo, water deer, hare, cat, raccoon dog, tiger, and bear. Sika is the dominant species, followed by water buffalo. The buffalo was previously considered the domestic species (Liu, Li 1994: 72–91), but my recent examination suggests that this was more probably a wild form. The Kangjia buffalo bones are very large; two measurements taken from the Kangjia specimens (metacarpal distal breadth: 100 mm; metatarsal distal breadth: 85 mm) are identical to those of *Bubalus wansjocki*, a late Pleistocene wild water buffalo found in the Ordos (Chardin and Young 1936: 51). This is the first time this wild buffalo has been identified in Holocene deposits in this region, suggesting that the Kangjia water buffalo was probably a residual form of this indigenous species. The age distribution of bovine remains shows that buffaloes were killed in all ages. While the highest frequency is from the sub-adult/adult age group, there are also some bones from the old age group, a situation that is absent among domestic animals such as pigs and sheep/goats (Figure 3.20).

If we compare the quantity of bones from major domestic animals (pig and sheep/goats) with wild animals (sika, water buffalo and water deer) from the entire T26 faunal assemblage, the wild animals (72 percent) were apparently dominant. The further analysis of the domestic-v.-wild ratio from early stratum to late stratum at the site shows that the proportion of wild animal bones increases from 63 percent to 83 percent, with a sharp decrease of pig (from 23 percent to 9 percent) and marked increase of buffalo (from 15 percent to 29 percent) and sika (from 31 percent to 49 percent) in NISP (Appendix 3.1). This change indicates that the Kangjia people increasingly relied on hunting for their protein sources.

Implications of Kangjia archaeological remains

Archaeological assemblages reveal some important information for understanding the general environment, and household subsistence economy and social activities at Kangjia.

Environment and ecology

The Longshan period in general had become cooler and drier than the previous period, as discussed in chapter 2. In the Wei River valley, this trend is reflected in the increase of drought-resistant herbs and coniferous trees in pollen samples from several Longshan sites, although there may have been high seasonal precipitation during the summer (Zhang Hongyan 1998: 125–126). However, the presence at Kangjia of bamboo rats, whose major diet is bamboo roots (He 1962), indicates a still relatively warm climate, as is also suggested by several studies of other sites (e.g., Andersson 1943; Li and Han 1963; Chardin and Young 1936; Zhu 1972).

Kangjia faunas reveal a landscape mixed with grassland, forests, and abundant fresh water. Like other Neolithic sites in the Wei River valley such as Banpo (Li and Han 1963) and Jiangzhai (Qi 1988), the land was covered with much denser vegetation than at present. Species that live in or near water include fish, shellfish, snails, water deer, and water buffalo, indicating that the site was not far from ponds, swamps, streams, and small rivers. This inference can be confirmed by the discovery of an ancient river course near the site (Xi'an Banpo Museum 1985). The raccoon dog lives mainly in forests and in thick vegetation bordering lakes and streams (Nowak and Paradiso 1983: 958–59). Sika deer normally inhabit areas covered with broadleaf and conifer mixed forests, woodland, and agricultural areas at forest edges (Sheng 1992). Sheep/goats and hares indicate the existence of pastoral land. The Li Mountains are about 20 km to the south, where tiger and bear may have been hunted.

Wild water buffalo, *Bubalus wansjocki,* has been found in many late Pleistocene sites in north China, including Salawusu in Ordos, Siyu in north Shanxi, Gulongshan and Shanchengzi in northeast China. The faunal assemblages associated with *Bubalus wansjocki* in these Pleistocene deposits suggest a relatively warm and moist environment with a mixture of grassland, forests, and lake/swamp (Chen Enzhi 1992: 1–73; Qi 1989), perhaps similar to the Kangjia environment. *B. wansjocki*, previously regarded as an extinct form, has not been reported from any other Neolithic sites. Its presence at Kangjia suggests that this site was located in an area where a sizable natural habitation existed, suitable for large wild beasts like water buffalo. This proposition may be supported by two factors. First, a large number of water buffalo (*Bubalus* sp.) bones (22.83 percent of the total NISP from the site) are also present in an early Neolithic site, Baijia (ca. 6000–5000 BC) (Zhou 1994), some 4 km southeast of Kangjia and north of the Wei River; but they are absent from Jiangzhai (ca. 5000–2000 BC) (Qi 1988; Zhou 1994), which is located near the mountainous region south of the Wei River (Figure 3.11). This phenomenon suggests that the wild buffalo was primarily distributed in the north of the lower Wei River valley. Second, the area in the north of the lower Wei River valley appears to have been largely uninhabited during the Neolithic and Bronze Ages, as indicated by the rarity of sites there dating to periods before the Han dynasty (206 BC–AD 220), based on archaeological surveys (National Bureau 1999: 50–63). Although we don't know exactly how far Kangjia was situated from wild habitations, it is possible that this settlement was more closely surrounded by agricultural fields and pastoral lands than by forests and swamps/lakes where buffalo and deer were hunted.

Subsistence and diet

The Kangjia people had a mixed subsistence economy including millet agriculture, animal husbandry, hunting, and gathering. Major faunal, floral, and mineral resources for subsistence needs were probably available within an area about 20 km in radius, judging from the distance between Kangjia and the Li Mountains where lithic materials and some wild animals were available. Except for lithic products, which were obtained from other locations, the subsistence economy was primarily self-sufficient.

As discussed before, the Kangjia faunal assemblage reveals an increase in exploitation of wild animals and a decrease in animal domestication, especially pig husbandry, during the Longshan period; this situation is not an isolated phenomenon. There is a general tendency in the archaeological record indicating that pig husbandry gradually declined during the Neolithic period in this part of the lower Wei River valley region. At the pre-Yangshao culture site Baijia (Zhou 1994), pig bones make up 34 percent of the total faunal NISP. At the Jiangzhai site (Qi 1988), however, the percentage of pig bones decreased sharply from 23 percent in the early Yangshao to 6 percent in the late Longshan. At the same time, the data from these

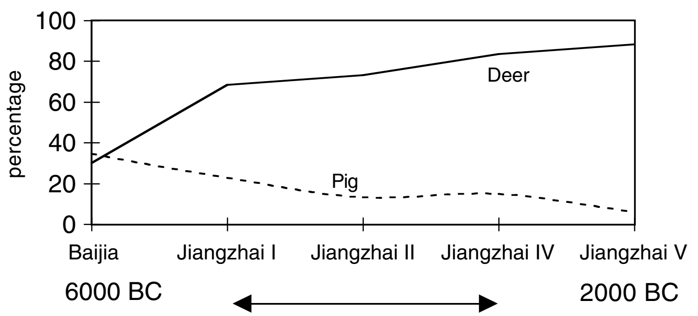


Figure 3.21 A comparison of the proportions of pig and deer bones at the Baijia and Jiangzhai sites in Lintong, Shaanxi, from 6000 to 2000 BC.

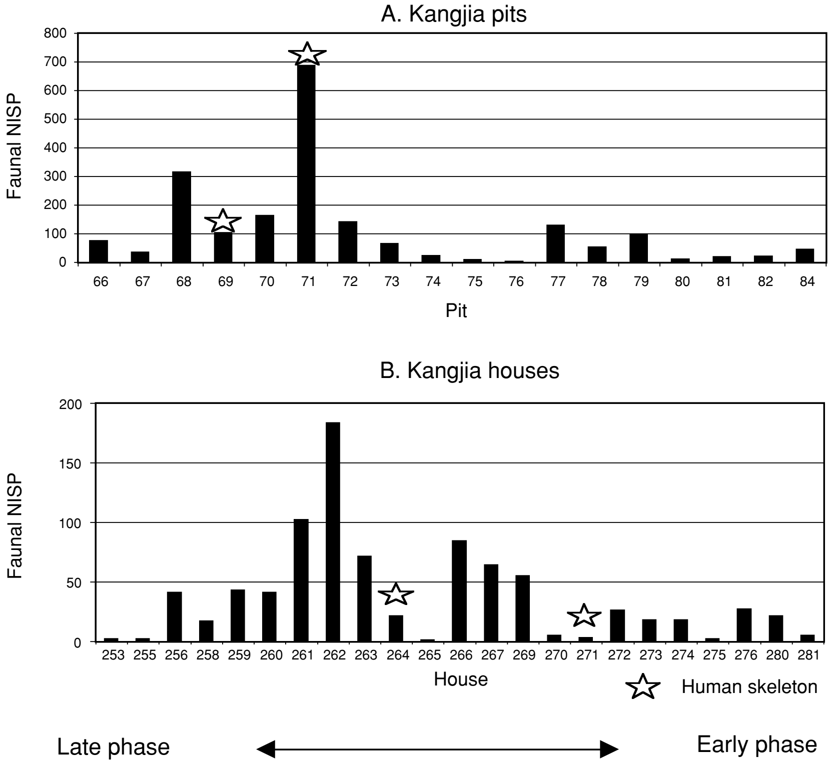


Figure 3.22 Distribution of faunal and human remains in pits (A) and houses (B) at Kangjia; histograms showing that the highest frequencies of animal NISP and human burials occur in the mid–late phase of the site occupation period.

two sites show that the proportion of deer bones increased sharply from 30 percent to 80 percent during the same period (Figure 3.21). This pattern is very different from faunal profiles at many Neolithic sites in Henan and Shandong, where pig bones became increasingly predominant in faunal assemblages during the Neolithic period (Yuan Jing 1999).

The faunal profiles seem to suggest that hunting wild animals, including some very large beasts, appears to have been a significant activity in the community. But this phenomenon may not represent the entire settlement, since the majority of pits in T26 did not contain large numbers of animal bones. Among these eighteen pits unearthed only two contained more than 300 bones each, while eight yielded less than 50 bones each (Figure 3.22A). This situation suggests that consumption of animal meat was not a part of the regular diet. In addition, some of those faunal-rich pits appear to have been associated with special activities, such as ritual feasting (see below); therefore the faunal profiles cannot be taken as a direct manifestation of the daily subsistence of the community. In the following discussion I will focus on social activities manifested in the faunal remains.

Social activities

Some social activities can be observed from the material remains, especially from two pits, H79 and H71.

Specialized hunting Pit H79 (diameter at top 2 m, diameter at base 2.8 m, depth 1.2 m) was found in the lower stratum of the Longshan deposit, below the earliest house foundations (Figure 3.13). It contained 74 animal bones, of which 72 belong to wild species and only 2 are from domestic forms (pig and sheep/goat). The overall ratio of wild to domestic animal bones is 36:1, showing an extremely high proportion of wild animal bones.

Most of these wild animal bones are identified as hare (31 NISP; 3 MNI) and raccoon dog (34 NISP; 5 MNI). The flesh of raccoon dog can be used for human consumption as well as for medicinal preparations, according to *Bencao Gangmu* (*Materia medica*), a late premodern pharmacopoeia written by Li Shizhen (AD 1518–1593) (Li [1578] 1981: 2881–2882) in the Ming dynasty (AD 1368–1644). In Japan, the bones have also been traditionally used for medicinal preparations, and the skin has been used in the manufacture of such items as parkas, bellows, and decorations on drums (Nowak and Paradiso 1983: 958–959). Those usages are suggestive for understanding the purposes of hunting raccoon dogs by the Longshan people, which might have been not only for consumption, but also for medicinal and ritual reasons. An oracle bone was also found in pit H79 (Figure 3.17C), indicating that divination was performed perhaps in regard to hunting, butchering, or consumption of animals found in the pit. The concentration of these hunted animals in H79 also implies that the members of this household once specialized in hunting.

Human sacrifice Several human skeletons in T26 are similar in many ways to those identified as human sacrifice victims in other Longshan sites, as discussed above. This atypical type of burial was found much more frequently in T26 than in other excavated areas at Kangjia.

If some Kangjia burials were the result of human sacrifice, what was the social status of these victims? Were these people from a lower stratum of the same community? Or were they war-captives from other communities? The former would indicate social stratification, and the latter would suggest inter-group conflict. Unfortunately, archaeologists have neither found the Kangjia cemetery, which would have contained the regular members of Kangjia community, nor examined the skeletons from T26 to compare them with samples from other parts of the site. Therefore, at this point I can only suggest that the human sacrifices at Kangjia may have been of people from low social strata in the same community or of persons captured from other groups.

At any rate, human sacrifice implies that one group of people brought force to bear on another group of people. When few households practiced human sacrifice, it implies inequality existed among different families within the community, and the household in T26 appears to have been more powerful than others.

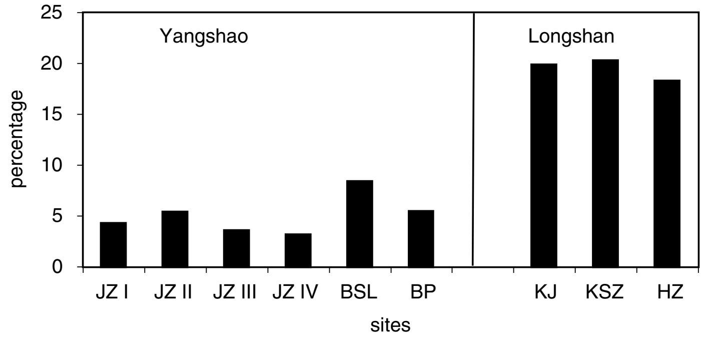


Figure 3.23 A comparison of the percentage of arrowheads from Yangshao and Longshan sites in the Wei River valley (JZ [I–IV]=Jiangzhai [Phases I–IV]; BSL=Beishouling; BP=Banpo; KJ=Kangjia; KSZ=Keshengzhuang; HZ=Hengzhen).

Hunting and warfare

Arrowheads form the most common item in the Kangjia tool assemblage, making up 27.2 percent of the total implements. Arrowheads may have been used for hunting and/or warfare. This high frequency of arrowheads is consistent with the large proportion of hunted wild animals in the Kangjia faunal assemblage and the existence of human sacrifices, perhaps as the result of inter-group conflict.

A comparison of the proportion of arrowheads in the total assemblage found at some Neolithic sites along the Wei River valley illustrates a sharp increase from Yangshao to Longshan (Figure 3.23). According to the observations of Yan (1987: 47) and Underhill (1989), arrowheads suddenly increase in number, and finely made spearheads appear at some Longshan sites in Henan and Shandong. Some skeletal remains also show direct evidence of violence against people. At the Jiangou site in Handan, Hebei, for example, skulls with signs of scalping were found within a house foundation, and human skeletons, some of which may have been buried alive, were discovered in two dry wells (Yan 1982). These findings suggest that intensified inter-group conflict became more prevalent during the late Longshan period. This situation may also apply to Kangjia.

Hunting and warfare may have been interrelated activities in complex societies, as manifested in the late Shang dynasty. According to oracle-bone inscriptions, the Shang kings were great hunters and warriors (Keightley 2000), and royal hunts also provided opportunities for military training (Keightley 2000: 109). Judging from the remains of specialized hunting in H79, the household in T26 may have been engaged in both hunting and warfare.

Ritual paraphernalia: turtle shells

Some turtle-bone fragments, including both carapace and plastron belonging to one individual, were uncovered from the pit; the plastron was painted with red pigment. The turtle is identified as *Chinemys reevesii*, which had not previously been found at archaeological sites in the Wei River valley. The possible function of Kangjia turtle shells can be inferred from some ancient ritual traditions associated with turtles in China.

Probably because of its longevity, the turtle has long been regarded in historical texts, such as *Shiji* (*Historical Memoirs*) (Sima [ca.100 BC] 1976) as an animal with a supernatural nature. A traditional belief in the divine nature of the turtle may also be attributable to its shape: the turtle has a round, domed upper shell and flat under shell. These shapes resemble the contours of heaven and earth in the cosmos, as believed in ancient China (Allan 1991:103–111). Turtle sacrifice has been and continues to be widespread in China and Oceania (Ling 1972). Use of turtle shells in China can be traced back to the early Neolithic, and the earliest archaeological evidence comes from the Jiahu site in Wuyang, Henan. Among 349 burials at Jiahu (ca. 7000–5500 BC), 23 were associated with turtle shells, which occur variously in number between 1 and 8 in each burial. The shells, containing small pebbles of various size, color, and quantity, were drilled with small holes, suggesting that each pair of shells was originally tied together with pebbles inside. Some of them were engraved with marks similar to the oracle-bone inscriptions of the Shang dynasty, and many were associated with bone flutes (Henan Institute 1999: 454–461).

In the Dawenkou culture, turtle shells have been found from many burial sites of about 4000–3000 BC (Gao and Shao 1986). These shells were usually found in the waist area of the skeletons, and occasionally lying on the humerus, ulna, or patella of the deceased. Most turtle shells have small holes, which were probably used for tying the two parts (plastron and carapace) together or tying something onto the shells. In some cases, X-shaped striations were found on the surface, suggesting that the two parts of the turtle were tied up with a rope. Small pebbles, bone needles, or bone awls were often found inside the paired shells, and some shells were painted with red pigment.

Turtle shells have also been found from burials at the Xiawanggang site in Xichuan, Henan (Henan Institute 1989: 25), Daxi in Wushan, Sichuan (Sichuan Museum 1981), Weidun in Wujin, Jiangsu (Changzhou Museum 1974), and Longgangsi in Nanzheng, southern Shaanxi (Shaanxi Institute 1990). All these sites are located in rather southerly regions (Figure 3.1) (see Gao and Shao 1986 for a review discussion).

A jade turtle and a jade plaque (Figure 3.24) were found on the chest of the deceased in a very elaborate Neolithic burial (M4), dated to around 2500 BC, at Lingjiatan in Hanshan, Anhui province (Anhui Institute 1989). The turtle is in two parts: a plastron and a carapace, originally tied together through small holes on the sides of the turtle. Between the two parts of the turtle, there is a rectangular-shaped jade plaque. On the face of the plaque, an elaborate diagram was engraved, which may have related to the origin of the Eight Trigrams (Chen Jiujin and Zhang 1989), a divination method used in ancient China. Therefore, the jade turtle may have carried some symbolic significance in ancient Chinese cosmology and functioned as an instrument used for divination.

The Turtle-Trigrams divination method still exists in contemporary Taiwan, where a set of turtle shells, a Trigrams disk, and a few coins are used together in the

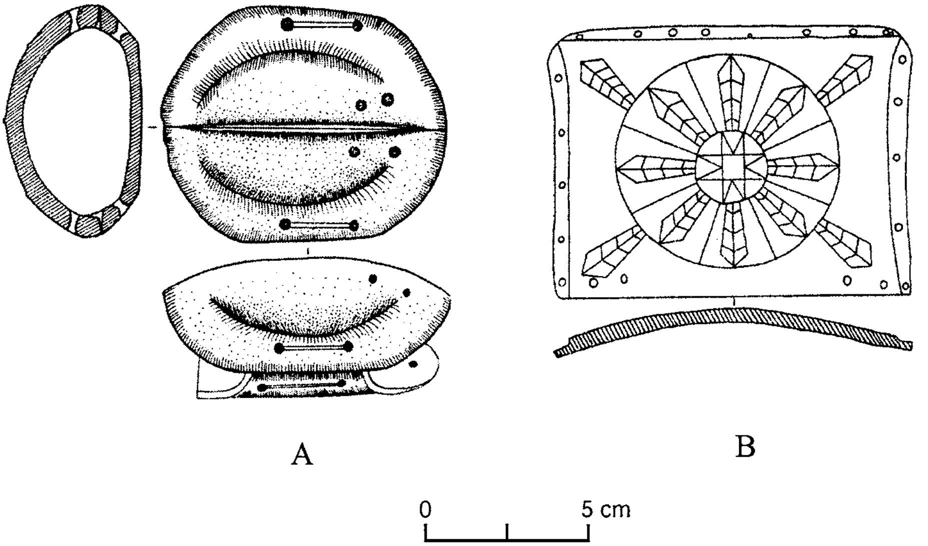


Figure 3.24 (A) Jade turtle shells, and (B) Jade plaque with the design of the Eight Trigrams, from Lingjiatan in Hanshan, Anhui (adapted from Anhui Institute 1989: fig.15; Chen and Zhang 1989: fig. 2).

divination process (Ling 1972: 73). This method of divination may be very different from the ancient practice, but the instrument used for this method is remarkably similar to the one found in the archaeological assemblage from Lingjiatan.

In the Dawenkou culture, most turtle shells were found in large- or medium-size burials (Gao and Shao 1986), and the jade turtle at the Lingjiatan site was apparently also from a tomb rich with burial goods. This phenomenon suggests that the turtle not only functioned as a ritual instrument but also represented high social status.

Archaeologists have made many speculations concerning the functions of these turtle shells (Luan 1997b). Some believe that these shells, similar to those used in native American cultures, were used as rattles in ceremonial dances (e.g., Wang Ningsheng 1998), some think that they were healing instruments used by shamans (Gao and Shao 1986; Luan 1997b), while others argue that they were most likely used as ritual paraphernalia for divinational purposes (e.g., Henan Institute 1999: 976–83). Based on archaeological findings and ethnographic analogy, it is reasonable to argue that the turtle shells found at Jiahu and the Dawenkou culture burials, painted, drilled with small holes, or containing pebbles and bone needles and awls, were used for various purposes in different regions. The most likely uses were as ritual paraphernalia, such as rattles in ritual performance and instruments for divination. The painted turtle-shell fragments from pit H71 at Kangjia probably also had similar functions. Originally they may have contained pebbles or something similar, but when the shells broke, the pebbles fell out and were lost.

Chinemys is a genus of semi-aquatic batagurines living in semi-tropical and tropical areas of southeastern Asia. Modern *Chinemys reevesii* occurs in Japan on Honshu and Kyushu, in Korea, Taiwan, Hong Kong, and in mainland China south of the

Yangzi River west of Guangdong (Ernst and Barbour 1989: 143,145). Archaeological remains of *Chinemys reevesii* in the Neolithic and Shang periods have been found at Hemudu in Zhejiang (Zhejiang Museum 1978), Songze in Shanghai (Huang Xianghong and Cao 1987), Weidun in Jiangsu (Huang Wenji 1978), and Anyang in Henan (Bien 1937). *Chinemys* sp. has been identified at Yinjiacheng in Sishui, Shandong (Lu and Zhou 1990), and Longgangsi in southern Shaanxi (Shaanxi Institute 1990). A distinctive feature of *Chinemys* is its low-arched carapace bearing either a single medial keel or a medial and two lateral keels. The carapace of the species *Chinemys reevesii* has three keels (Ernst and Barbour 1989: 143,145). The jade turtle from Lingjiatan clearly demonstrates three keels on its carapace (Figure 3.24), indicating that it might be an imitation of *Chinemys reevesii*. Turtle bones not identified to species have also been found in many Neolithic sites in southern China and the Shandong region (Gao and Shao 1986).

The nearest site to Kangjia, from which *Chinemys* has been uncovered, is a Yangshao cemetery at Longgangsi in southern Shaanxi (Shaanxi Institute 1990). Longgangsi is located in the Han River valley, to the south of the Qinling Mountains, where the climate is warmer than the Wei River valley, located north of the Qinling mountains (Figure 3.1). No remains of *Chinemys reevesii* have ever been reported from the northwestern part of China including the Wei River valley, except for the Kangjia specimens. These phenomena suggest that the climatic conditions of ancient northwestern China may not have provided a suitable semi-tropical or tropical climate for the survival of *Chinemys reevesii*, and it is likely that the turtle shells from Kangjia were obtained, directly or indirectly, from southern or southeastern regions where the animal lived. The implication here is that long-distance trade for ritual objects underlies this discovery at the Neolithic Kangjia village. Turtle shells were ritual paraphernalia. The exchange of such objects suggests that the interregional interaction was carried out by ritual practitioners who might belong to the T26 household.

Divinational implements: oracle bones

Three oracle bones were unearthed from ritual contexts in T26 (Figure 3.17). This divinational implement also manifests a widespread tradition in the Neolithic period. Oracle bones made of animal scapulae have been found at many Neolithic sites over north China, including Shandong, Hebei, Henan, Shanxi, Shaanxi, Gansu, Liaoning, and Inner Mongolia. The earliest known examples come from Fujiamen in Wushan, Gansu, dating to the Shilingxia phase of the Majiayao culture (ca. 3980–3640 BC). A group of oracle bones, made of scapulae from sheep/goats, pigs, and cattle, were discovered on a house floor (Xie 1998). The scapulae tend to be those of locally available animals, and therefore vary from site to site. Judging from the similarity of the traces on the oracle bones, similar techniques were probably employed in the divination process among those Neolithic sites. This involved burning a number of points on the thin area of the scapula with a hot medium to produce cracks on the bone surface, the cracks being the sources for divinatory interpretation. This method preceded the Shang oracle-bone divination (Keightley 1978).

At Kangjia, in addition to three examples from T26, oracle bones have been found in other excavated areas of the site (Kangjia Team 1988, 1992). Since they occur in contexts which show ritual activities of some kind, as revealed in T26, divination was possibly only practiced for special events and conducted by ritual specialists.

Ritual feasting

Animal bones from T26 are especially numerous, but they were unevenly distributed throughout the deposits. Pit H71 (top diameters 1.70 m and base diameter 2.1 m, depth 0.9 m), although not large in volume, yielded a total of 695 NISP, identified to at least sixteen species. These account for 35 percent of the total NISP from the eighteen pits in T26, and account for the highest number of animal bones in any one of all the features.

As discussed above, H71 was made for burial, and filled within a short time period. The faunal assemblage in H71 also shows interesting patterns in food consumption. Some phalanges from buffalo and deer appear to have been articulated, and many fragments of ribs and vertebrae were found in this pit. The ratio between identified cranial and long bones from medium and large mammals (125 NISP) and fragments of ribs and vertebrae (232 NISP) is 1:1.80. This ratio is in sharp contrast to the corresponding ones from eight other pits (each containing more than 15 bones), where the proportions of ribs and vertebrae are much lower, ranging from 1.80:1 to 1:1.02. This phenomenon implies that a large proportion of the whole bodies of the large and medium animals, mostly water buffalo, deer, pigs, and dogs, may have been consumed near H71. The calculation of MNI suggests that those bones belong to 2 buffalo, 4 sika deer, 2 pigs and 1 dog (Appendix 4.1). Wild buffalo is a very large animal, and an Indian wild buffalo (*Bubalus arnee*) can weigh nearly 1000 kg (Mason 1974: 4). A Sika deer weights about 100 to 150 kg (Sheng 1992: 202). If large parts of these animals were consumed there, as suggested by the analysis above, then such a huge quantity of meat must have catered for a large number of people attending the feast.

Among the 137 identified mammal bones, 25 were burnt, most of which are of water buffalo and sika. Many bone fragments of large and medium mammals, which may also be water buffalo and sika, were burnt as well. This pattern suggests that a certain method of food preparation – roasting hunted animal meat on an open fire – was used for communal food consumption in this special event.

Among 20 sika phalanges and 1 goat phalanx, 13 were corroded to different degrees. Etched surfaces of these bones are shiny, and broken edges wafer-thin and sharp, all features characteristic of bones which have passed through a dog's digestive tract (Davis 1987: 148–149). The high concentration of digested phalanges has only been seen from pit H71 in T26. The phalanges may have come from the stomach of the dog which was killed and then consumed near pit H71.

H71 also contained some faunas, which are absent or rarely occur in other features in T26. These include 1 catfish, 3 craw bones, 3 fox metacarpals belonging to the same individual, and part of a bear maxilla. Such assorted faunal remains in great variety but in small quantities seem to have been pulled from different sources, perhaps the contributions made by other households to the ritual event.

Putting several lines of evidence together, pit H71, situated extremely close to the door of a house, was probably intentionally made for a ritual event which involved feasting. During this event a partially dismembered human body was buried, ritual performance using oracle bone and turtle shells was conducted, and large quantities of animal meat, shellfish, and wild fruits were consumed at the same time. Afterwards the pit was filled at once, indicated by the fruit remains dispersed throughout the fill. This feasting appears to have been sponsored by the T26 household, and participants possibly included a large part of the community and perhaps persons outside the community.

Pit H71 is not the only feature which contained a large number of faunal remains. Some other pits, which yielded abundant animal bones may also have resulted from feasting. In addition, large quantities of animal bones and pottery sherds, often in clusters, were found inside the rammed-earth walls; it is possible that some of them were the remains of feasts associated with house construction. Figure 3.22B shows the distribution of animal bones, ranging from 1 to 183 in number, found in houses. Comparing histograms for the bone distribution in both pits and houses, we can see a general trend: feasting activities and the practice of human sacrifice occurred more frequently and on a larger scale during the mid–late phase of the residential occupation period of this household (Figure 3.22). Did other households at Kangjia also host feasts? It is very possible. But we cannot know for sure until we have opportunities to examine faunal remains from other excavated areas at the site.

What may have been the function of ritual feasting at Kangjia? To answer this question we need to turn to ethnographic analogy. The feasting activities of the Akha people in Northern Thailand have been documented by Clarke (2001), as summarized below, showing some parallels to the Kangjia situation.

The Akha have a transegalitarian society (i.e. between egalitarian and chiefdom). The people practice agriculture, relying on a fluctuating, somewhat unpredictable, but labor-intensive resource base. This economic condition underlies the collaborative nature of the social structure. In Akha society differences in wealth and power exist between individuals and family groups, but socio-economic inequity, competition, and aggrandizing behavior emerges primarily between the lineages and clans as a whole, rather than between individuals. Feasting, which is integral to the dynamics of clan/lineage relations in this society, indicates the need for a structured and dependable life-crisis support network (Clarke 2001: 144–149).

Akha life is replete with feasting. Their many types of feasts include ancestor offering, newborn naming, harvest, and life-cycle crisis. The scale of feasts also varies markedly, ranging from a few people and the ritualized consumption of food to enormous gatherings involving up to 1,000 participants, who may consume several water buffalos, pigs, and chickens over a period of weeks. The functions of feastings are primarily to provide solidarity and promote the prestige of social groups at various social levels from family to village. It is notable that the most elaborate feasts are often associated with weddings, building new houses, and funerals. These are the types of feasts intended to be grandiose and promotional (Clarke 2001: 151–153).

The Neolithic Kangjia community in several respects is similar to the Akha. Kangjia people relied on millet agriculture and animal husbandry, which were perhaps fluctuating resources during the post-climatic optimum period. This is suggested by the high infant mortality rate in the Kangjia pig population. The Kangjia social organization may be similar to that of the Akha, as the Kangjia settlement shows differentiation among house groups (a unique feature in T26 is paintings on several house floors) but without marked social stratification. The decline of domestic animals means that a large portion of protein in the human diet had to come from hunted animals, which required skill and teamwork to obtain them. In such ecological conditions, creating and maintaining alliance and cooperation between social groups, especially kinship related ones, would have been essential for the community's survival.

Meat is always the principal food in feasts. Since meat is not a daily component of the diet in agricultural communities, the offering of an expensive animal for sacrifice is reason enough to gain prestige (cf. Clarke 2001: 160). Therefore, skilled hunters would have greater opportunities to promote their social status in a community. This may have been the situation applying to the household in T26, which yielded evidence for specialized hunting (H79). In addition, hunting animals may carry symbolic meanings other than merely obtaining protein. Hunting in many complex societies is a strongly ritualized activity and success in hunting frequently is taken as evidence of supernatural approval and support (Helms 1992a). Therefore, successful hunting would ideologically reinforce the prestige of individuals and social groups.

This symbolic aspect of hunting may be observed in the late Shang dynasty, in which hunting was one of the significant ritual activities of the royal court. The animals, used as ritual sacrifice, played a role to link the kings with supernatural power (Fiskesjö 2001; Keightley 2000: 107–113). It is notable that the Shang kings' favorite game include buffalo and deer (Lefeuvre 1990–1991; Yang Zhongjian and Liu 1949). More interestingly, Shang kings even traveled to the lower Wei River valley to hunt. As recorded by Sima Qian in "Yin benji" in *Shiji*, King Wuyi was killed by lightning during a hunt in an area between the Wei and Yellow rivers. Hunting associated with economic, political and symbolic power may have had a long tradition back to the Neolithic period in this region, and the consumption of wild animals in ritual feasting was a tangible medium materializing the intangible symbolic power.

Summary

Kangjia was apparently situated in an environment with abundant natural resources, which could have provided a basis for surplus production used by self-interested aggrandizers to gain prestige and power through conducting ritual feasting.

Feasting would have functioned as a social mechanism that created and maintained a life-crisis support group; it could also be an avenue for people to negotiate for power within their greater support group and a medium of competition for status between social groups. The ability to provide wild animals for feasting is an important condition for the families to gain political and religious prestige. Since it is usually the elite households that host and frequent large-scale feasting, the house group in T26 may have been the residence of the elite in the community, at least for a period of time.

The quotation from *Guoyu* written in the fourth century BC, cited at the beginning of this chapter, reveals important information on prehistory. From the point of view of people in the fourth-century BC, rituals should be conducted by shamans, not by individuals of each household. The implication of this message for archaeologists is, however, that there were household rituals conducted by religious practitioners. Archaeological observations presented above seem to support this implication.

Conclusions

Based on a cross-regional analysis of household activities and contextual analysis of material remains from the T26 household, we can now attempt to reconstruct an overall picture of life in the Neolithic period, particularly in Kangjia.

During the Neolithic period, the division of labor appears to have become more pronounced, while the use of space became more gender- and function-specific. In general a house unit was probably occupied by a nuclear family. At Kangjia a household group, composed of several such family units which were kin-related, formed a basic economic unit – like an extended family.

The mixed and self-sufficient subsistence economy of the Kangjia village included agriculture, animal husbandry, hunting, and gathering. There was a decline in pig husbandry but an increase in hunting of wild animals and raising of domestic grazing animals. This general trend coincides with a period of climatic fluctuation in the third millennium BC, suggesting a new pattern of adaptations by the Kangjia people to the worsened ecological conditions. As a result, the community's survival as a whole primarily relied on cooperation and alliance, which were achieved, to some extent, through ritual feasting.

Feasting is a social mechanism which not only maintains reciprocal relationships, but also creates opportunities for developing social inequality and political competition among individuals and social groups. Feasts conducted at household level became more prevalent during the late Neolithic period, as exemplified by the household remains at Yuchisi, Yinjiacheng and Kangjia. In the Yuchisi and Yinjiacheng cases, the families which conducted certain types of craft production (pottery) may have been in better positions to host frequent feasts. In the Kangjia case, the individuals who had special skills and abilities in hunting and ritual performance seem to have been particularly involved in hosting ritual feasts. However, further research is needed to understand how these families associated with craft specialization may have been able to accumulate food surpluses for providing frequent feasts.

There seems to have been competition among households for gaining prestige in Neolithic communities. By performing more human sacrifices and hosting more frequent feasting in their own courtyards and by having special access to exotic ritual goods, the elite households competed for power. Since the food, at least a large proportion of the food, for feasting was usually produced by the host families, those households would not have been alienated from subsistence production.

There are several lines of evidence for regional interactions. First, sheep/goats were brought into the middle and lower Yellow River valley in the Longshan period. Although we are not entirely clear how such cultural interaction was initiated, it may have been the result of population movements or diffusion of ideas and technology, and searching for new sources of prestige and exotic food by the elite may also have been a major dynamic. Second, the elite may have sought precious ritual objects (e.g., turtle shells) through long-distance trade, although prestige goods (such as jades) have rarely been found in the Wei River valley (this subject is further explored in chapter 5). Third, inter-group warfare may have been practiced for ritual purposes, for instance, to obtain captives for human sacrifice. Finally, the use of certain kinds of ritual paraphernalia (e.g., turtle shells and oracle bones) in the Yellow River valley during the Longshan period indicates that a shared belief system was widespread over a broad area.

Interregional interaction was a common phenomenon in the late Neolithic period in China. In many regions such interactions were associated with production and exchange of prestige goods, especially jades, carried out by the elite (Liu, L. 2003). In the Kangjia case, on the contrary, there is little evidence for prestige-goods production, and exchange of ritual goods was not a regular activity. Although the Kangjia elite indeed had contacts with other regions and practiced rituals similar to other communities, they may have not developed an inter-regional network for frequent elite-goods exchange aimed at promoting individual status. In contrast, there was a greater emphasis on the cooperation and alliance among social groups, observable in feasting, and less internal stratification within communities. The adoption of such political strategies, to some extent, may have been a social response to the ecological environment.

Although we can see a general trend in the development of social complexity in household activities during the Neolithic period, it needs to be pointed out that societies developed unevenly in different regions, and Kangjia only represents one variation of social organization at the time. In the following chapters I will discuss the variability of Neolithic societies over a broader region.

4

Spatial organization and social relations in communities

> In one year residences may grow into a settlement, in two years they may form a town, and in three years they may become a city.
>
> "Wudi benji" in *Shiji*, by Sima Qian, ca. 100 BC

Introduction

Shifting focus from the household to the community, this chapter examines social forms at the intra-settlement level during the Neolithic period. I will discuss changes in architectural forms and settlement layout, and how these spatial patterns were related to social organization and mechanisms.

The spatial structure of a settlement is not only regulated by the physical requirements of effort expenditure, but also by the need to consistently distinguish between different categories of activity and between people of different social status. In other words, a human community has to define boundaries separating the different portions of the settlement, and relate to the orders of nature and culture within the community (Fletcher 1977: 48–55). These relationships should be reflected in the arrangement of community structures, which may be observed archaeologically. It has long been recognized that spatial relationships among archaeological features and artifacts within a settlement can provide important information about the social and economic patterns of a given community (Chang 1968; Deetz 1968; Hodder 1979; Trigger 1968).

Modeling the spatial patterns of residential areas has also been a major concern in studies of complex societies. It has been argued that in chiefdoms, residential structures not only may have shown hierarchy in size and quality but also may have been organized in segregated spaces, so that elites and commoners occupied separate areas in a given community and elite houses were often located near ceremonial centers (Wright 1984). I will therefore examine the emergence of such residential segregation in the research area.

Spatial distribution of particular artifacts and features relating to crafts also provides information about craft production, which is among the most basic of integrating social mechanisms. Specialized craft production is not only an economic behavior, but also a social behavior. It creates social networks beyond the immediate family, and helps individuals to gain access to key resources, cooperative labor, mates, etc. As society became more functionally specialized, individuals who were socially recognized as having a specialty would have a better chance to participate

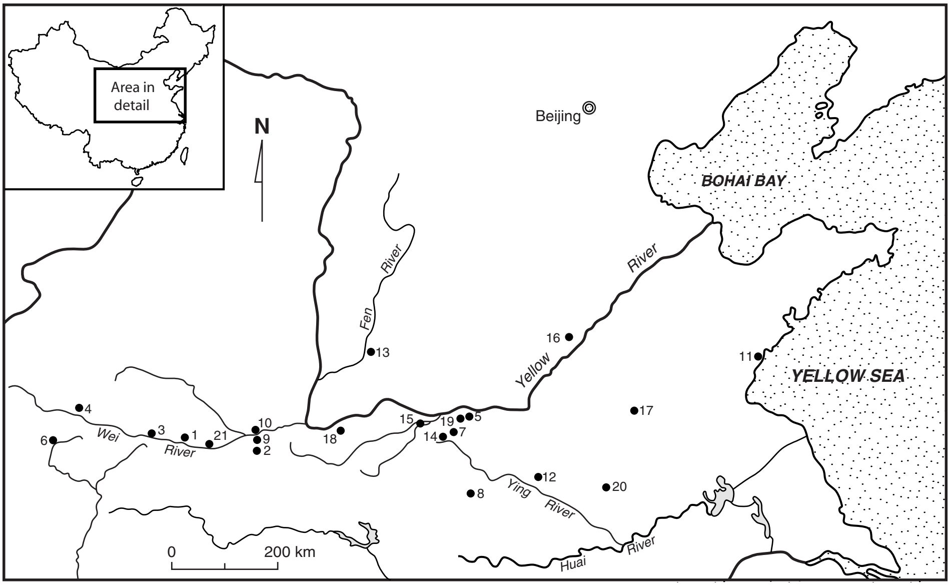


Figure 4.1 Locations of major sites mentioned in chapter 4. 1: Anban; 2: Banpo; 3: Beishouling; 4: Dadiwan; 5: Dahecun; 6: Gaositou; 7: Guchengzhai; 8: Jiahu; 9: Jiangzhai; 10: Kangjia; 11: Liangchengzhen; 12: Pingliangtai; 13: Taosi; 14: Wangchenggang; 15: Wangwan; 16: Wangzhuang; 17: Xikangliu; 18: Xipo; 19: Xishan; 20: Yuchisi; 21: Zhaojialai.

fully in supra-domestic economic and social networks (Costin 1998: 10). Therefore, it is crucial to investigate whether craftsmen played an important role in the development of social ranking in the community, and whether the communities associated with craft production assumed special positions in a settlement system.

In order to see the changes through time, a diachronic approach is needed. I first analyze the spatial arrangements and social organization of several settlements in different periods during the Neolithic, and then focus on the Longshan culture. Figure 4.1 illustrates the locations of major sites mentioned in this chapter.

Spatial orders of settlements in the Neolithic period

The development of the house structure and of settlement organization manifests several trends, which coincide with the social transformation towards complexity in these regions.

Peiligang culture (ca. 7000–5000 BC)

The earliest house structures unearthed in archaeological contexts in the region concerned were found at several pre-Yangshao sites. Sites belonging to this period are often small, mostly 1 to 2 ha in area, and no larger than 6 ha (see chapter 6). Most houses from these sites are small and round semi-subterranean structures, less than 10 m^2 in size and most are only 4 to 6 m^2 (Gansu Museum 1983c; Henan Provincial

Museum 1979; Yan 1989b: 198). Based on the best-documented excavations of a large Peiligang culture site at Jiahu in Wuyang, Henan (Figure 4.1), there are a number of variations in house structure and residential pattern.

The Jiahu site, 5.5 ha in area, is bounded by a lake and two rivers. The site was first occupied from 7000 to 5800 BC by Neolithic settlers, and was destroyed by flood, shown by a layer of static-water sediment found above the Neolithic strata. Most excavations were concentrated in the western sector of the site, and a large amount of material remains, including domestic features and artifacts, have been found. Most houses were single semi-subterranean structures in oval, round, or irregular shapes, and a few were ground-level houses and pile-dwellings. Several multiple-roomed houses were the results of expansion from original single-roomed houses (Henan Institute 1999).

Neolithic deposits at the site can be divided into three phases. In Phase I, houses, often closely associated with pits and burials, appear to group into three clusters, one on the east and two on the west of the site. The largest one, situated on the western part, consisted of 6 round semi-subterranean structures and 1 pile-dwelling, 24 burials, more than 30 pits, and 2 kilns. The biggest structure, F17 (24 m^2), was situated in the center of this cluster. F17 seems to have been a single-roomed structure in its initial construction, and later was enlarged several times, becoming a multiple-roomed structure. The remaining houses (2 to 18 m^2 in size) in this cluster all had doors facing the center, and the burials were scattered within the cluster (Figure 4.2). In these houses archaeologists found large numbers of ceramic sherds, tools, and faunal and floral remains in the deposits underneath house floors. These remains were probably accumulated domestic debris, which would help us to understand the function of these structures. It is clear that all six structures appear to have been residential houses, except for the pile-structure (F38) which had neither domestic features (such as a hearth), nor artifacts in the deposit (Appendix 5.1). Each house yielded pottery sherds including at least cooking and serving vessels, indicating their domestic function. These two large houses, F5 and F17, yielded more types and higher quantities of ceramics than others. Four houses yielded production and maintenance tools, but only the two large houses contained additional manufacturing tools. The differences between the large and small houses seem to lie in the function – more types of tasks were performed in the large houses than in the small ones. Based on spatial dimensions of the settlement, close interaction, rather than segmentation, appears to have been predominant among members of the most likely kin-related group within each cluster. Such a proximate relationship may have also existed between the living and dead in the spiritual domain, since the burials were located extremely near houses (Figure 4.2).

In Phases II and III, the site was still partitioned into several residential clusters. Differing from the previous phase, however, each house group was associated with a cemetery, which was spatially separated from the residential area. Kilns were also grouped together close to one of the residential clusters. Two sections of ditch, probably belonging to a moat surrounding the site, have been found in the

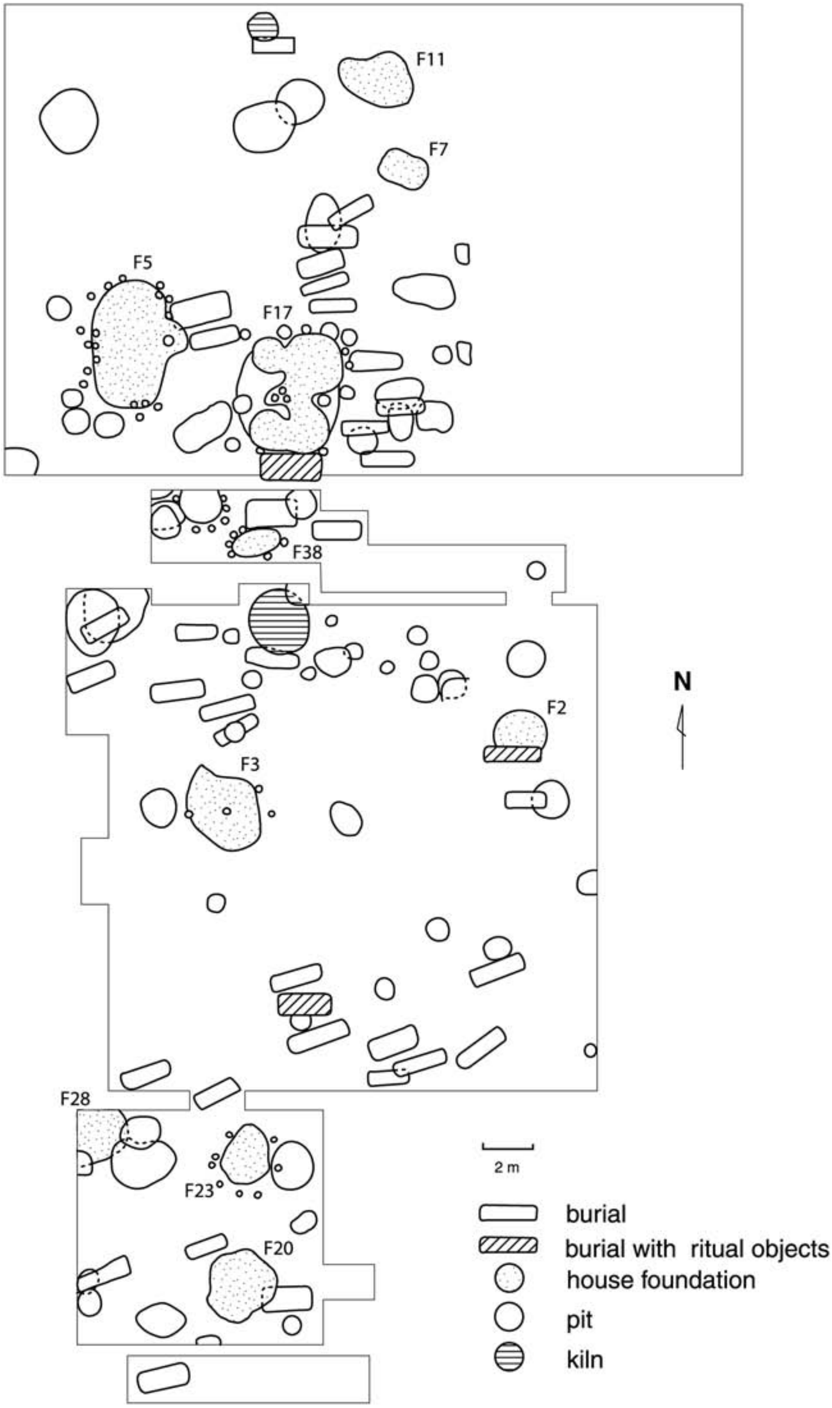


Figure 4.2 Distribution of residential features and burials of Phase I in the northern part of the western section at the Jiahu site, showing the largest residential cluster centered at F17 (adapted from Henan Institute 1999: 322, 323, 324).

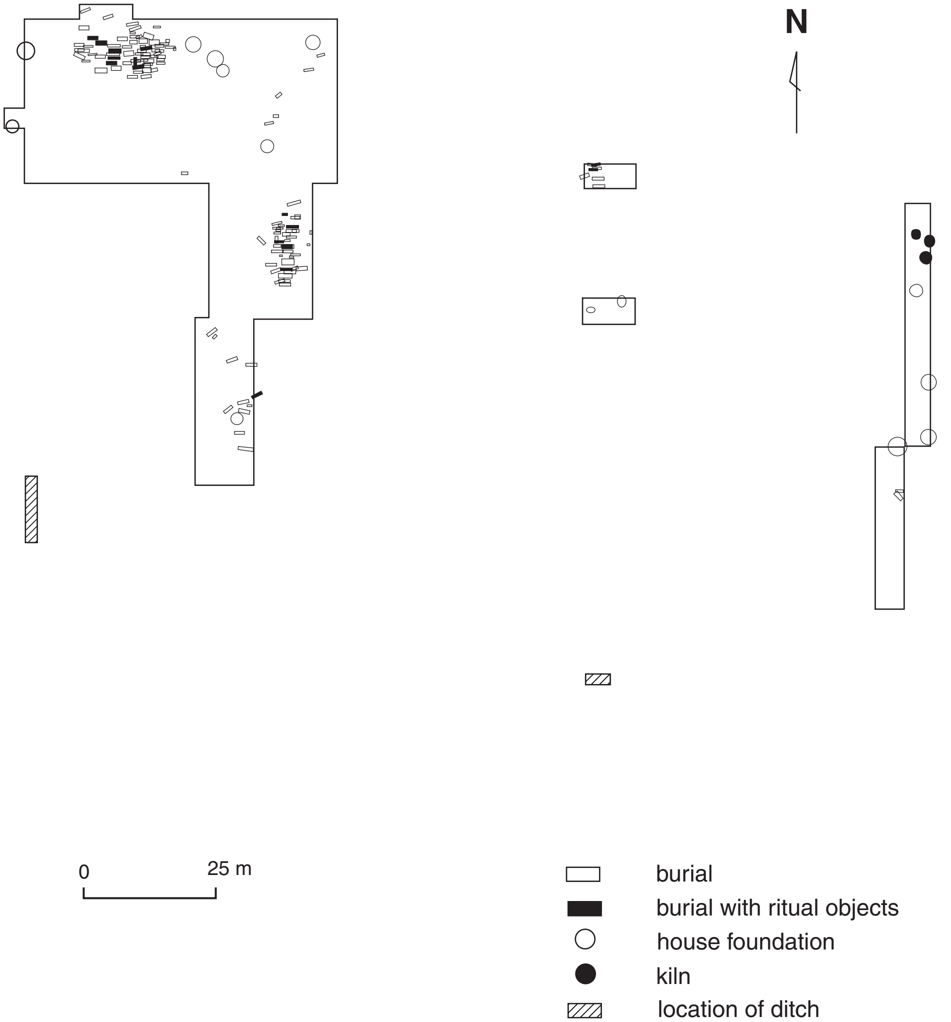


Figure 4.3 Distribution of house foundations, burials, kilns, and traces of ditches at the Jiahu site, Phase II; note that locations of pits are not indicated (adapted from Henan Institute 1999: figs. 3, 325, 327, 328, 329).

southwest and south of the site (Henan Institute 1999: 956–961) (Figure 4.3). The Jiahu site in its later phases shows much more regular residential planning than the earliest phase, which manifests the initial expansion of the residential groups in the settlement.

Residential patterns at Jiahu are characterized by three features: First, the settlement was divided into several residential groups; second, within a residential group small houses were arranged around one or two large houses in the center, and the large houses may have been the locations for the kin group to conduct certain types of indoor tasks together; and third, the settlement was surrounded by a moat to protect the domestic community from the wild. As discussed in chapter 3 the distribution of tools in Jiahu burials shows a minimum level of gender- or function-based segmentation, and the locational behavior patterns at the settlement level, described above, support this observation. The society was relatively egalitarian in nature.

Pottery and stone tools were primarily produced locally, judging from the presence of kilns and a large quantity of stone waste material, semi-finished tools and raw materials, weighing more than 193 kg. Most lithic raw materials were cobbles available in the nearby rivers, but a few were obtained from mountainous regions as far as 100 km away. These include slate and shale for making tools, and mica used as tempers in pottery paste. A small number of artifacts were made of jade and turquoise, which may have come from more distant places (Henan Institute 1999: 820–824). The Jiahu village was largely self-sufficient in terms of both agricultural and craft production, but inter-village trade at the regional level was necessary for obtaining some raw material and utilitarian items.

Several Peiligang sites near the mountainous areas seem to have specialized in the production of stone tools, as indicated by the remains of lithic manufacture. These sites include Tieshenggou in Gongyi (Kaifeng Bureau 1980; Liu, *et al.* 2002–2004), Shawoli in Xinzheng (Institute of Archaeology 1983b), Dazhangzhuang in Fangcheng (Nanyang 1983), and Egou in Mixian (Henan Provincial Museum 1981) (Figure 6.1). Scattered lithic materials have been found in at least one house at Egou; and semi-finished stone tools and lithic raw materials were buried as grave goods in several tombs at Shawoli. Burial M19 at Shawoli, for example, had 6 spades, 5 chisels, 4 axes, 3 whetstones, 1 hammer stone, and a number of chipped stone tools and flakes. The occupant of this tomb perhaps was a stonemason. The stone-tool production was more probably a part-time specialization conducted at household level. Not every settlement produced stone tools; several excavated Peiligang settlements located far from lithic sources, such as Peiligang in Xinzheng (Kaifeng Bureau 1978) and Wayaozui in Gongyi (Gongyi City 1997) (Figure 6.1), yielded little evidence for stone-tool manufacture. Most Peiligang sites have revealed well-made ground stone implements remarkably similar in style (Tong Zhuchen 1994: 72–108). Such shared material features, therefore, may have resulted from inter-settlement trade, and from the exchange of technology among those lithic manufacture sites. All Peiligang sites are small in size, and those sites with evidence of stone tool manufacture are not particularly bigger than the others. This suggests that the practice of craft specialization did not lead to social inequalities. Craftsmen who made utilitarian items were apparently recognizable as specialists, as indicated by their grave goods. But there is no evidence that they held any special status in the communities.

These characteristics in settlement layout, subsistence economy, and craft production, first demonstrated at Jiahu, are continuously revealed, and with increasing prominence, in the records of many Yangshao sites during the middle Neolithic period.

Early Yangshao culture (ca. 5000–4000 BC)

Settlement information for this period is best represented by the data from several well-reported sites in the Wei River valley, including Banpo (Institute of Archaeology

1963), Jiangzhai (Xi'an Banpo Museum *et al.* 1988), and Beishouling (Institute of Archaeology 1983a) (Figure 4.1), all dated to the early Yangshao (the Banpo phase). In general, more varieties of structure were developed during this period. The house structures can be classified into five categories – small round, medium round, small squared or rectangular, medium squared, and large squared. Both semi-subterranean and ground-level houses were built (Yan 1989b).

These sites share a similar layout: the settlement, which was enclosed by a ditch or natural barriers, was divided into a few residential sectors. Each sector, in turn, included a large house and several medium and small houses. The best example is the Jiangzhai site. It covers an area of 5 ha and comprises five prehistoric cultural levels. Excavations of the bottom level, dated to the Banpo phase, have provided a plan of the complete layout from which the structure of the village community can be reconstructed. The center of the site was a plaza, in which two areas of ashy soil, perhaps with ritual functions (He Zhoude 2003), were identified. A circle of houses was built on the periphery, with all the doors facing the central plaza. The entire residential area, measuring about 2 ha in size, was surrounded by ditches, outside of which burials were distributed. The houses were clustered into five groups or residential sectors, and each group included several small and medium houses and one large house (Xi'an Banpo Museum *et al.* 1988) (Figure 4.4.). Recent studies of the Jiangzhai population suggest 75 to 125 persons based on settlement data and 85 to 100 persons based on burial data (Zhao Chunqing 1995, 1998); these account for an average population range of 80 to 112.5 persons, at a population density of 44 to 63 persons and a mean of 53.5 persons per ha.

The social implications of this settlement have been a matter of debate. A traditional interpretation by Chinese archaeologists, influenced by Morgan's classical evolutionary approach, held that Jiangzhai represented a matrilineal social organization which practiced "pairing marriage," and that small- and medium-sized houses were used for the members of matrilineal clans, while the large houses were the residences of either chiefs or secret social groups (e.g., Xi'an Banpo Museum *et al.* 1988: 352–357; Yan 1989a). These explanations, the result of influences from Soviet archaeology in the 1950s,[4] have been very influential in China, but earned little support from archaeologists outside China (see chapter 1). A recent study on Jiangzhai by Lee (1993) has put forward an alternative interpretation. He focuses on spatial relationships within each residential sector, in which smaller clusters were spatially well defined. According to Lee, most clusters comprised domestic features including houses, hearths, and pits, and were probably occupied by single socio-economic units – households. Several large clusters composed only of storage pits are remote from other features and may have been owned by the community as a whole. The large houses lack domestic features, especially pits, suggesting that they were common houses for the hosting of public activities (Lee 1993).

This argument for the non-residential character of large houses can be supported by the fact that no cooking vessel was found inside these buildings. Two (F47 and F53) out of five large buildings were associated with artifacts. For example, F47 (89 m^2), in the northern residential cluster, contained 10 tools, all distributed near

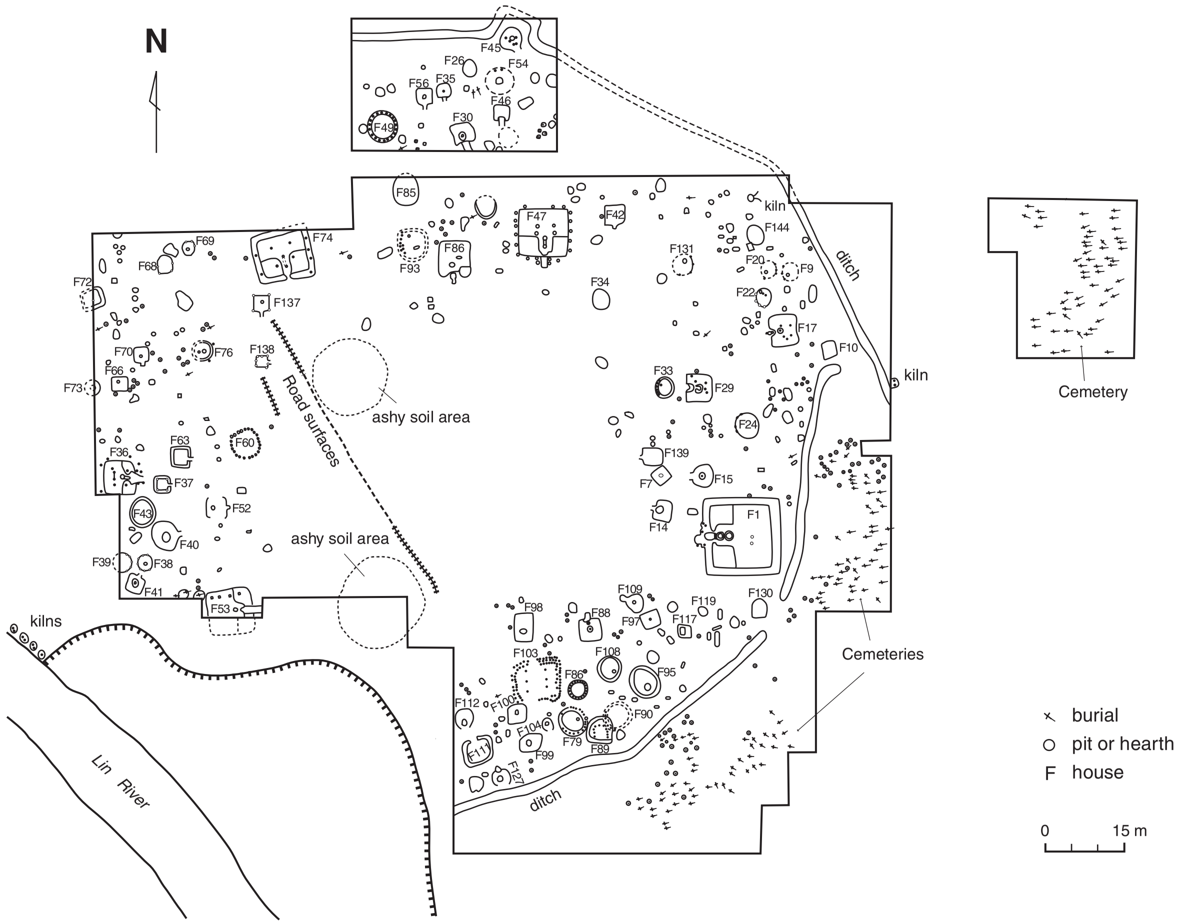


Figure 4.4 Layout of the Yangshao culture village at Jiangzhai (adapted from Xi'an Banpo Museum *et al.* 1988: fig. 6).

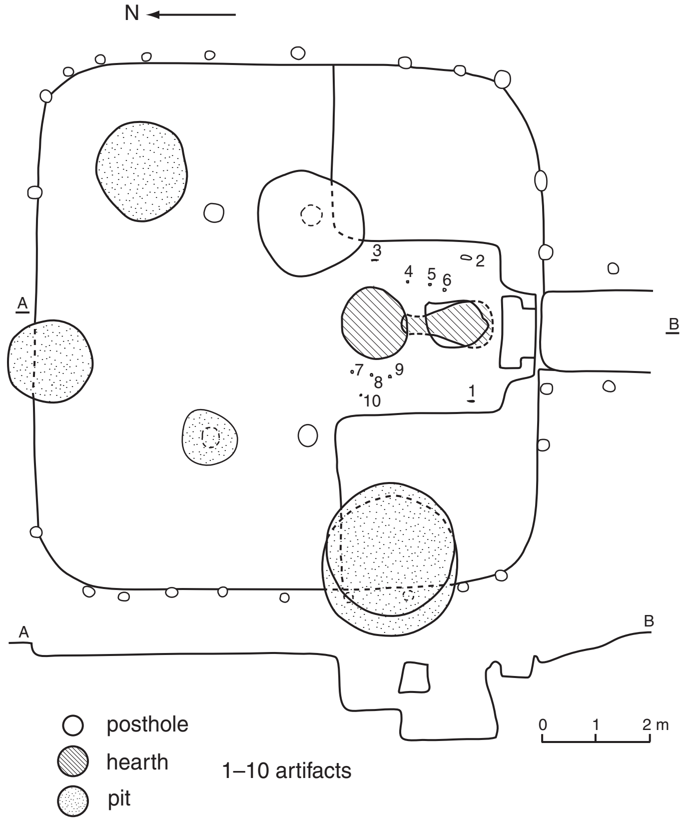


Figure 4.5 Plan of house F47 with artifacts found *in situ* at Jiangzhai, Banpo Phase, Yangshao culture (1: axe; 2: whetstone; 3: pottery file; 4–10: pottery scraper) (adapted from Xi'an Banpo Museum *et al.* 1988: fig. 14).

the hearth. These include an axe, a whetstone, a pottery file, and 7 pottery scrapers (Figure 4.5) (Xi'an Banpo Museum *et al.* 1988: 24–25). Except for the axe as a male tool, all the rest were non-gender specific tools, according to the burial data described in chapter 3. The pottery scrapers vary in shape, and were made of sherds. They may have been used primarily for cutting millet stems according to an experimental study, and perhaps also for processing leathers (Wang Weilin and Wang 1999). Similarly, F53 in the western sector at the site yielded only a water jar, a pottery file, and an awl. Residential groups therefore may have used the large buildings as communal working facilities for conducting particular types of tasks collectively. Such a production function associated with public buildings is similar to the situation revealed in the Jiahu site as described above.

Craft productions at Jiangzhai include pottery and stone-tool manufacture. Pottery kilns and remains of workshops were found in eastern, western, southern, and southwestern parts of the site, both in the residential area and outside the ditches (Xi'an Banpo Museum *et al.* 1988: 48–50) (Figure 4.4). The kilns were small in size, and probably could accommodate only four to eight small vessels in each firing.

Such a scattered distribution of kilns suggests that ceramic manufactures were most probably carried out as part-time household production. On the contrary, stone-tool production seems to have been more specialized. Only stone axes, made of cobbles, may have been produced in large quantity at Jiangzhai. This is indicated by the presence of 86 semi-finished stone axes, compared to 64 finished ones. Amongst 10 semi-finished axes published in the report, 8 were found in the southern residential cluster, whereas the finished products were distributed throughout the site (Xi'an Banpo Museum *et al.* 1988: 70–73). These patterns suggest that some individuals in the southern residential sector at Jiangzhai may have specialized in stone-axe manufacture. Since the residential layout in the southern cluster was similar to others in the settlement, with no evidence for special stonemason workshops, the production was most probably a part-time specialization carried out by households.

Since different tool types required different lithic materials in order to achieve certain functions, stone assemblages at Neolithic sites were composed of a variety of lithic materials which might not have been all locally available. It is possible that some axes made at Jiangzhai were used for external trade, and that communities elsewhere made other types of stone tools and exchanged their products with Jiangzhai. At Banpo, for example, a total of 1,342 stone tools were unearthed, and many of them may have been made locally, as suggested by the presence of some semi-finished tools at the site (Institute of Archaeology 1963: 108–109).[5] A total of 37 types of lithic materials have been identified from the stone tools. Most of these materials can be obtained from nearby river beds and mountainous regions today, and the situation was probably very similar in prehistoric times, but several important lithic types (e.g., basalt, diabase, gabbro for making axes) are not available in the immediate surrounding areas (Wang Xinlu 1991). These phenomena suggest that Yangshao villages were not entirely self-sufficient in subsistence. Inter-community trade, which included but was not limited to stone tools, was clearly a part of the regional economic system. The need for exchange of utilitarian goods, therefore, may have stimulated communications among Yangshao settlements and formed some common cultural characteristics at the regional level.

Similar cultural elements among Yangshao sites were also manifested in ritual activities. Three Yangshao sites, Banpo, Jiangzhai, and Beishouling, stretching about 200 km in distance along the Wei River valley, yielded a distinctive type of pottery vessel: basins painted with anthropomorphic designs. The principal motifs are human heads wearing pointed headgear decorated with feather-like objects, fish or fish-like objects emerging from faces, in most cases with the eyes closed (Figure 4.6). These basins, together with large urns were usually used for burying children near the residential areas. At Jiangzhai three urn burials using such basins were found near a medium-size house (F86) in the north residential cluster (Figure 4.4). Some scholars have suggested that these motifs may have had ritual significance, depicting images of religious mediators, based on their common theme of human–animal transformation (e.g., Chang 1983a: 114–115). These images may have illustrated the costumes of ritual practitioners at that time. The recurrence of these motifs at

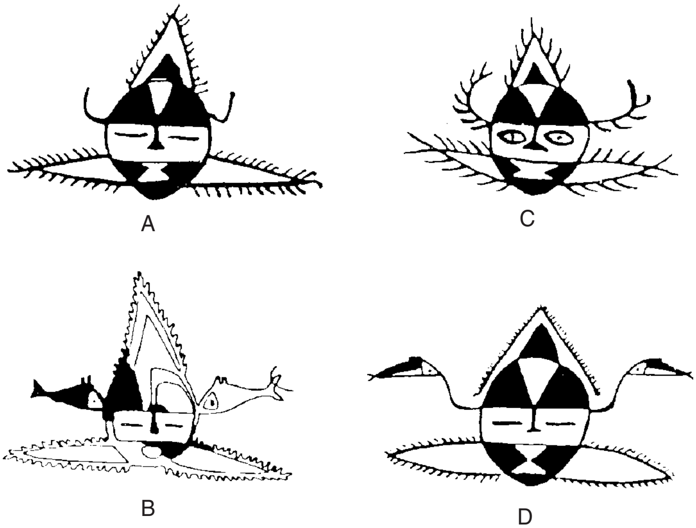


Figure 4.6 Anthropomorphic designs painted on ceramic basins unearthed from (A) Banpo, (B) Beishouling, (C)–(D) Jiangzhai in the Wei River valley; early Yangshao period.

several sites suggests a similar ritual practice shared among communities across the Wei River region.

Five generalizations, therefore, can be made about the community organizations in this period: (1) residential groups in the settlement were structurally and functionally homologous, and the social organization can be characterized as segmentary societies and the basic production unit may have been the household (Lee 1993). (2) Judging from the fact that a few storage pits were community owned and certain tasks were carried out collectively in public buildings, some aspects of production and distribution were possibly arranged at a community level; large public buildings thus may have functioned as communal activity centers. (3) Craft production was most probably carried out on a part-time basis, but some products (such as certain types of stone tools) may have become more specialized than others (such as pottery), due to the availability of local raw materials. Trade for those less-accessible utilitarian items may have played an important role in the regional economy and cultural interaction. (4) Many communities in a broad region may have had a shared belief system and practiced similar ritual activities. (5) No evidence for social stratification has been observed, and, similar to the previous period, these societies were most probably egalitarian in nature.

Middle Yangshao culture (ca. 4000–3500 BC)

Settlement patterns in the middle Yangshao period are unclear, due to the lack of large-scale excavations. Some very large sites, up to 90 ha, have been found recently in Lingbao, western Henan (Henan 1st Team 2001a). Among these sites Xipo (40 ha) has yielded foundations of several large buildings (Figure 4.1). The largest one, F105, is a square-shaped subterranean structure, with a rammed-earth foundation measuring 2.75 m in depth. The remaining subterranean walls were up to 0.95 m

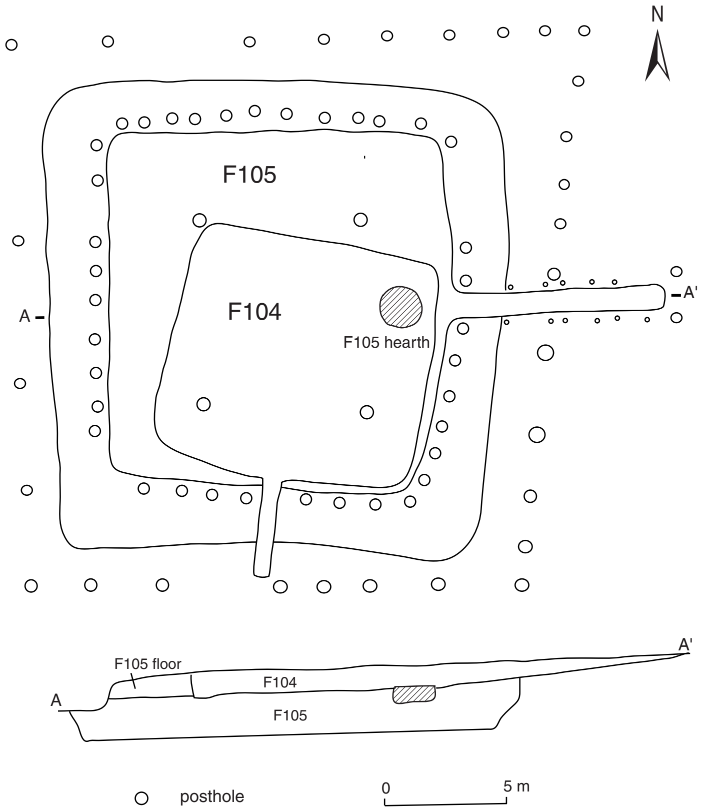


Figure 4.7 A large building (F105) and a medium building (F104) found at Xipo in Lingbao, Henan, mid-Yangshao culture (Wei and Li 2002).

deep, the narrow ramp-shaped entrance was 8.75 m long and 1 m wide, and porches as indicated by postholes surrounded the building. The entire structure measured 516 m^2, and the room area was 204 m^2. The floor was made of several layers of different materials, including daub, a mixture of powdered calcium clay and shells, and gray clay; and the floor and walls were plastered with red pigment, identified as cinnabar. Pieces of cinnabar were deposited in the postholes and rammed-earth foundation. A hearth was located near the entrance inside the building, but no ash pit containing domestic refuse has been found near the building (Henan 1st Team 2001b; Henan Institute 2003) (Figure 4.7). This structure was perhaps built for holding ritual ceremonies, rather than for domestic purposes. Its construction may have required a large labor force assembled from several villages (Ma 2003).

F105 appears to have been used for a short period of time before being intentionally abandoned. Shortly after that, more than nine medium-size buildings, up to 83 m^2 in room area (F104), were constructed using similar techniques as those for F105 (Figure 4.7). Many ash pits were found near these buildings, containing a large amount of artifacts and faunal remains, suggesting that these buildings were domestic architecture. Animal bones, predominantly from pigs, were especially abundant

(Henan Institute 2002a). The faunal assemblages show patterns indicating that a large number of pigs were slaughtered, and a large part of them were consumed, near the deposit areas, suggesting feasting behaviors (Ma 2003).

Among these medium-size buildings, at least two were associated with large grinding slabs used for processing cinnabar. Cinnabar was widely used in the Neolithic, mainly as red pigment for painting pottery (e.g., Li Minsheng *et al.* 1994) and house floors (e.g., F105 at Xipo), and as a ritual substance scattered around the deceased in tombs (e.g., Peking University 2002: 29, 45). During the late Neolithic and Bronze Age periods cinnabar was particularly used for furnishing elite burials, as indicated by traces of cinnabar near skeletons in elite tombs at Taosi and Erlitou (Gao Wei *et al.* 1983: 533; Institute of Archaeology 1999b), and this practice continued in the historical period. Cinnabar occurs either as native, usually as crystals or powdery depositions, or in ore combinations with other minerals, needing to be processed before use. Cinnabar deposits in north China are rare, and Henan lacks such deposits today. The pre-twentieth-century cinnabar mining sites near Lingbao can be found in east Shaanxi, especially in the Qinling Mountains (Golas 1999: 139–141). It is not clear where the Neolithic people at Xipo obtained cinnabar, but given that the Qinling Mountains extend from Shaanxi to west Henan including Lingbao, cinnabar may have been available in the mountainous areas near Xipo during the Yangshao period. It is notable that several Yangshao burial sites, which yielded red pigment (some identified as cinnabar), are primarily distributed in west Henan and east Shaanxi (Ma 2003: 87–91). These suggest that there was a regional demand of cinnabar for ritual usage during the Yangshao period.

Since cinnabar was probably a scarce resource in this region, control of the access to cinnabar deposits and production process may have become an opportunity for some individuals or families to gain prestige and power. The existence of multiple houses associated with cinnabar processing also suggests factional competition among groups within a community, and feasting activities may have also been conducted for competition between social factions.

These new developments in regional settlement patterns and intra-settlement relationships point to a significant transformation in social organization during the mid-Yangshao period, signaling the emergence of a social structure more complex than the segementary tribal society of the early Yangshao period. However, no evidence for social stratification in burials has been found, leaving more unanswered questions for the future. It is also unclear whether or not Lingbao was an isolated example of the development of complex society at this level, since no other region has been investigated carefully.

Late Yangshao culture (ca. 3500–3000 BC)

In the late Yangshao period, new architectural forms developed. Square-shaped ground-level houses became dominant, and multi-roomed longhouses began to appear, such as the examples found at Dahecun in Zhengzhou, Henan (Figure 4.1) (Zhengzhou Institute 2001). Some house floors were paved with a layer of lime. Some features of settlement organization developed during the middle Yangshao period, now continued, including large-sized settlements associated with palace-like public architecture. In addition, the first walled-town site occurred in the Yellow River valley region.

Large settlements: Two sites can be used as examples for large, late Yangshao settlements: Dadiwan in Qin'an, Gansu, and Anban in Fufeng, Shaanxi.

Dadiwan is located at the south of the Qingshui River (Figure 4.1). Excavations have yielded rich cultural deposits ranging from the early Neolithic to the late Yangshao period (about 3,000 years). The early occupation is relatively small in size (about 10 ha), located on second- and third-level terraces near the river. The settlement expanded during middle and late Yangshao culture, developing from the terrace area upward to the adjacent hill slope (nearly 100 ha).

On the sloping area, several residential sectors have been identified; each included some large and small buildings (Gansu Museum 1983a, c; Lang 1988; Yan 1989b). House F405 is one example of the large buildings found in Section IV (Gansu Museum 1983b). The foundation covers an area of 270 m^2 (150 m^2 in room area), and a large hearth (0.6 m high, 2.34 m in diameter) was situated at the center. The surfaces of the floor, walls, posts, and hearth were treated with lime plaster. Three doors were found in the front and side walls, and apron structures were found on the two sides of the building. This building probably functioned as a public house for hosting communal activities, judging from the large sizes of its foundation plan and hearth; it may have also been used as a residential building, since ceramic vessels and stone tools were found in the room. The people who occupied the house may have possessed high social status, as indicated by a white marble object, probably a scepter, found in the building.

About 240 m north of F405 on a north–south axis, a palace-like large foundation, F901 (Figure 4.8), was found in the center of the site (Gansu Cultural Relics 1986;

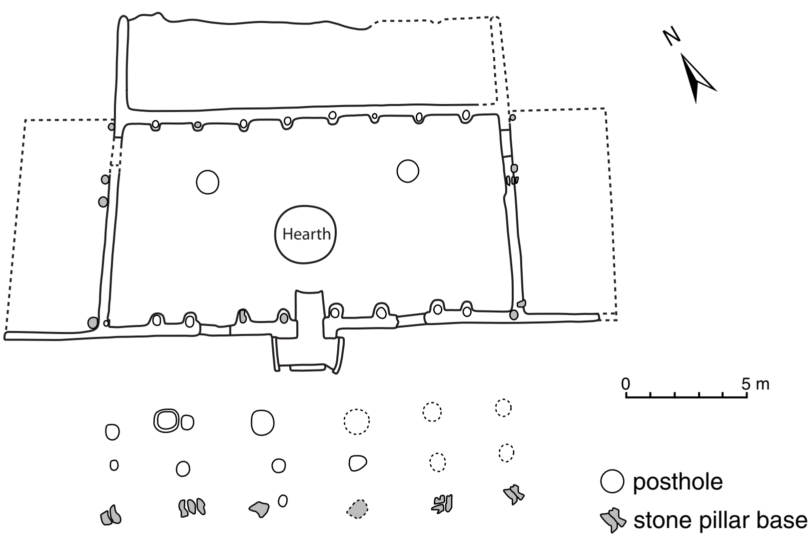


Figure 4.8 Plan of a large building (F901) at the Dadiwan site, late Yangshao culture (adapted from Gansu Cultural Relics 1986: fig. 2).

Figure 4.9 Ceramic artifacts, including a storage urn and probably a set of measures, unearthed from F901 at Dadiwan (after Su 1999: 91; with permission from Wenwu Press).

Lang 1988: 38). F901 was a multi-roomed structure covering an area of 290 m^2 (420 m^2 including affiliated structures). It comprises a major room in the center and several small rooms on the two sides and at the back. A large fireplace, 2.6 m in diameter, is located at the center of the major room, and there are three doors on the front wall facing the south. Several large ceramic objects were discovered in the major room. The forms of these objects are uncommon in the contemporary ceramic assemblages from ordinary village sites. These include items such as a four-legged *ding* cauldron, a rectangular-shaped basin, two *chao* scoops – one large and one small, a four-handled *guan* pot, and a funnel-shaped lid (Figure 4.9). The analysis of the shape, size, and capacity of the basin, scoops, and pod suggests that they may have been used as a set of measures. Three large-sized pottery urns were found in the back room, and these may have been used for grain storage (Zhao Jianlong 1990). There are two rows of postholes and one row of stone pillar bases in front of the building, which may indicate a large porch-like structure there. No other contemporary house remains, but pressed soil layers exist within an area of about 1000 m^2 in front of this foundation, indicating this area was probably used as a large public plaza for communal activities. This structure may have functioned as a central place for activities of regional communities, including perhaps feasting, redistribution, and ritual performances, rather than as an elite residence.

We do not know the complete spatial arrangement of architectural remains at Dadiwan, due to the lack of published site maps. But based on available information, it is still possible to reconstruct a sketchy plan of the site. There is some continuity of basic settlement layout from Jiangzhai to Dadiwan in that settlements were partitioned into multiple residential sectors, which, in turn, included some small houses as well as public buildings. Judging from the large size of the site and the existence of public buildings at Dadiwan, it may represent a community at a high level in the regional settlement hierarchy.

The large houses (e.g., F405) in each residential sector may have been occupied as elite residences while used for public affairs as well. The palace-like large building located in the center of the site was complex in structure and isolated from the rest of the community, indicating its special function, probably for hosting public activities of both local and regional communities.

Dadiwan is not the only site in which palace-like architectures existed in the region during the late Yangshao. More than 100 km south of Dadiwan, the Gaositou site (Figure 4.1), covering a large area on terraces and a hill slope, was found on the western bank of the Xihanshui River in Lixian, Gansu. A large building foundation (F1) which is structurally similar to F901 at Dadiwan, with a remaining floor plan of 22.7 m in width, is located at the center of the settlement (Lang 1990: 61; Zhao Jianlong 1990). Gaositou may represent another large regional center in this area.

Anban (70 ha), located over 200 km east of Dadiwan (Figure 4.1), may also have been a regional center. A large architectural foundation measuring 165 m^2 in area (F3) was also discovered at the site. Similar to F901 at Dadiwan, F3 was built on high ground and located at the center of the site; stone pillar bases were found in front of the structure (Figure 4.10). From the pits near the foundation an array of objects was unearthed, indicating the special function of the building. These include a large pottery scoop (perhaps a measure) almost identical to the one from Dadiwan (Figure 4.9), many animal bones including several pig mandibles painted with red pigment and heads wrapped with fabrics, and eight small baked clay figurines (2.7–6.8 cm high), most of which were broken. One of the figurines is headless, and rendered as a pregnant woman; several manifest long and straight or hooked noses, including one with full beard, and one with pierced ears. In addition, most of them have either pointed or flat-topped headgear (Figure 4.11: 3–6) (Northwestern University 1992, 1996, 2000). These objects may have been associated with ceremonial performance involving fertility rituals. This large building, therefore, may have been used as a public ceremonial center. Interestingly, these figurines manifest several physical and cultural characteristics which were non-local in origin. These include long and large nose, full beard, and tall headgear.

The Anban figurines are rare finds in terms of their concentrated distribution, but they are not the only examples of this kind dating to the Yangshao culture. Baked clay figurines or reliefs on pottery vessels in human forms have been found at several Neolithic sites in the middle and upper Yellow River valley (Zhang Guangli *et al.* 1983). Among them three demonstrate the most remarkable similarities to the Anban examples. A human face relief attached on a Yangshao basin was discovered at Jiangxicun in Fufeng (Wei River Team 1959), which is about 10 km south of Anban. This relief shows a human face with long and hooked nose, thin lips and narrow face (Figure 4.11: 7). A clay mask of a human head, 10 cm in height, was found at Liujiahe in Ankang, southern Shaanxi (Shaanxi Institute 1998: 5), and dates to

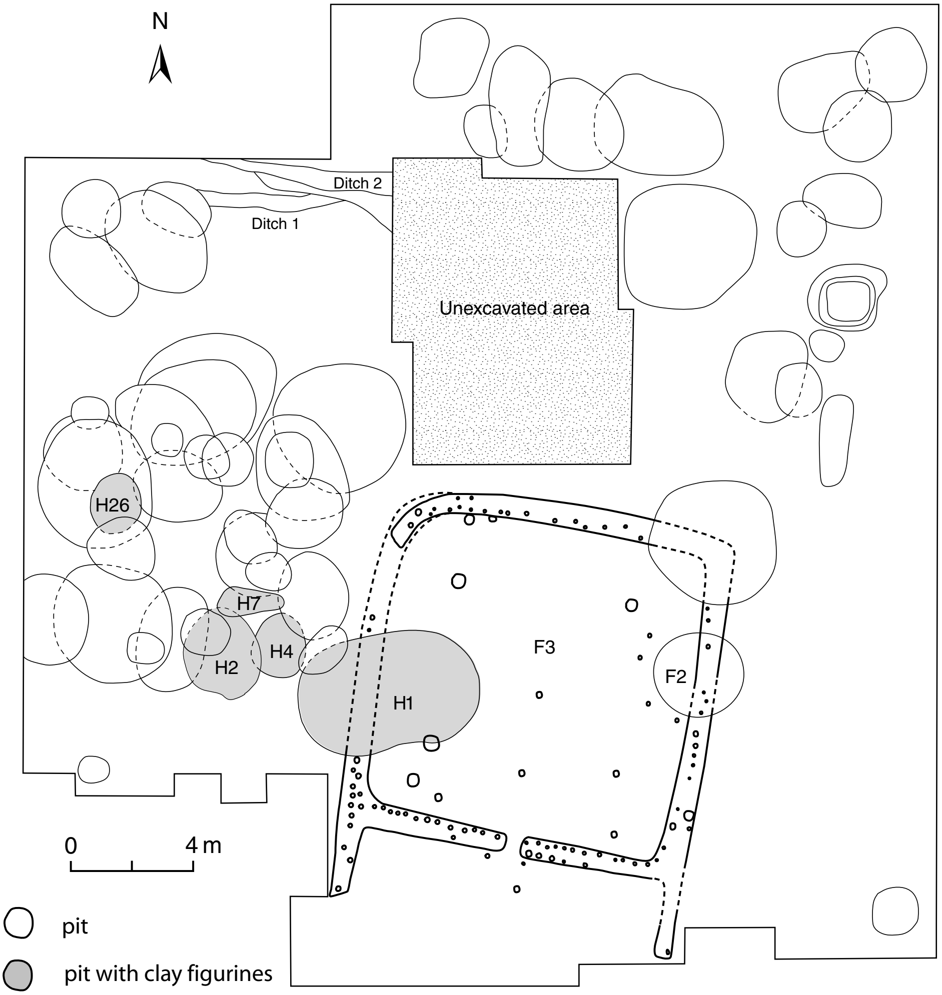


Figure 4.10 The large building (F3) in relation to ash pits, some of which contain human figurines, at Anban in Shaanxi, late Yangshao culture (adapted from Northwestern University 2000: fig. 7).

the Miaodigou phase of the middle Yangshao period (Wang Weilin 2002, personal communication). This realistically rendered sculpture has a long and large nose, deep eyes and narrow face. Each ear has a small hole, perhaps for wearing earrings. Another hole is placed on top of the head, probably for inserting a headdress. The back of this mask is concave in shape and two additional small holes are situated on the sides of the rear head, suggesting that the mask may have been attached to another object (Figure 4.11: 1). These two human heads clearly show Caucasian characteristics. A clay figurine (6.4 cm high), also dating to the middle Yangshao period, was found at Dengjiazhuang in Lintong, Shaanxi (Zhao Kangmin 1982: 6). Female characteristics are indicated on the torso. She wears a flat-topped headdress similar to that of the Anban figurine, but her face does not show Caucasian features (Figure 4.11: 2).

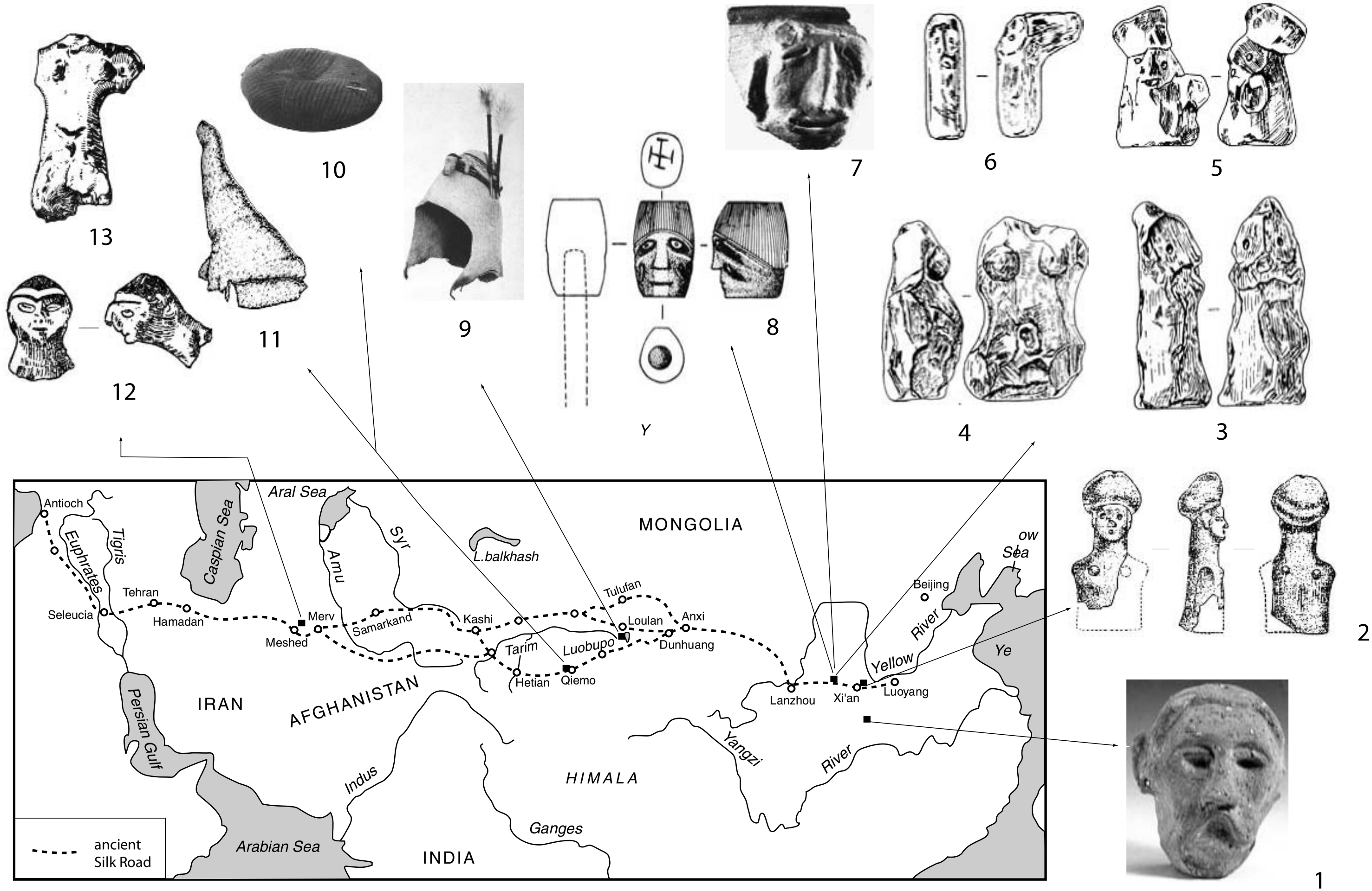


Figure 4.11 Human figurines and hats discovered from Shaanxi and Central Asia; 1: Liujiahe in Ankang; 2: Dengjiazhuang in Lintong; 3–6: Anban in Fufeng; 7: Jiangxicun in Fufeng; 8: Zhouyuan in Fufeng; 9–11: Xinjiang; 12: Kara-Depe in Turkmenistan; 13: Geoksyur in Turkmenistan.

The Neolithic human figurines and reliefs found in the Yellow River region vary greatly in style and craftsmanship, suggesting that they were made by individuals for specific occasions. Although some were fashioned stylistically and others were rendered realistically, these figures may reflect the images of ritual practitioners and costumes that they wore. It is interesting to notice that, similar to the anthropomorphic motifs on painted pottery basins of the early Yangshao period, tall headdresses were often depicted as a part of the costumes (Figure 4.6).

Archaeologists discovered two small heads carved from shell, which were used as ornamental tips for hairpins, in a Western Zhou palace complex (1045–771 BC) at Zhouyuan in Fufeng (about 15 km northwest of Anban). Both heads show distinctive Caucasoid facial features similar to the Neolithic examples described above, and wearing headgear which are tapering truncated cones with closely spaced vertical striations. One of them bears a sign on top of the headgear, which is identical to the oracle-bone inscription for "*wu*," meaning ritual mediator and sometimes translated as shaman (Yin 1986) (Figure 4.11: 8). Some scholars have suggested that these figures may have depicted Sakas from Central Asia (Yin 1986), who were magic performers with no political significance (Shui 1998). Others believe that they were possibly magicians of Iranian origin, perhaps from the Andronovo culture, who served as diviners in the Zhou royal court and may have been politically important (Mair 1990). It is difficult to know, based on available information, if these foreign individuals acted as merely entertainers or as powerful priests in the Zhou court. It also makes little sense to project a modern concept of ritual, as opposed to entertainment, onto the tasks performed by those ancient magicians. But it is crucial to understand whether these foreign individuals played a significant role in social transformation in this part of China.

Most examples of Caucasoid figures as described above have been found in Fufeng near the Wei River, although their dates stretch from 4000 BC to 1000 BC. The Wei River valley is a region in which ethnic groups from west and east made contact with each other throughout history, thus it is entirely possible that such contacts had already taken place in prehistory. Since the population of Central Asia has always been ethnically complex, the ritual practitioners with Central Asian origins depicted on the figurines might be both Mongoloid and Caucasoid.

Terracotta human figurines, including both female and male, have been widely found at sites across the former Soviet Central Asia dating to the Chalcolithic period (Gupta 1979: 53–132). Most Central Asian figurines are stylistically different from the Yangshao examples, but some show clear resemblances to the Anban examples. In Turkmenistan, for example, a male figurine from Kara-Depe has beard, hooknose and pointed headgear, and several female figurines found at a Geoksyur site are headless, a characteristic seen in the Anban example (Figure 4.11: 12, 13) (Gupta 1979: Figs. 2.19, 2.23; Kohl 1984: Plates 5b, 6c). Both sites date to Namazga III (ca. 3500–3000 BC) (Kohl 1984: 214–215), which is contemporary with the late Yangshao period.

Since J. G. Andersson discovered the first Neolithic village at the Yangshao site in Henan, and linked the Yangshao painted pottery with that of Anau in Turkmenistan in the 1920s (Andersson 1923), it has been a sensitive issue in archaeological circles regarding whether or not early Chinese civilization received any cultural inspiration from the West (see chapter 1). The finding of hairpins with Caucasoid heads at Zhouyuan in Shaanxi and artifacts with Central Asian characteristics at Erlitou, the first Bronze Age urban site in Henan, has led to a renewed interest in the interactions between ancient China and cultures beyond China's modern western boundaries (Fitzgerald-Huber 1995; Mair 1990). The similarities between the Yangshao and Central Asian figurines seem to support the argument that cultural contacts between the East and West occurred throughout prehistory and history long before the establishment of the Silk Road. However, it is questionable whether those Caucasoid individuals came directly from Kara-Depe and Geoksyur, which are about 4000 km from the Wei River valley. The more likely sources of Central Asian cultural influence may have been the northwestern region of modern China, such as Xinjiang, in which cultural traditions have always been similar to those in the western part of Central Asia (Mair 1998), reflecting adaptation to a pastoral way of life in similar environmental conditions, which were the combination of oasis, steppes, desert, and mountains. These Central Asian regions were traditionally connected to the east with the Central Plains of north China through the Gansu Corridor, known as the Silk Road established around 140 BC. Interestingly, Kara-Depe and Geoksyur are located near the Silk Road (Figure 4.11).

Unfortunately, archaeologists in northwestern China have not found any sites which are associated with material remains comparable with those from Kara-Depe or Geoksyur. However, the extraordinary discoveries of well-preserved mummies in the Tarim basin suggest that Caucasoid populations settled in this region for thousands of years, starting at latest in 2000 BC (Barber 1999; Mallory and Mair 2000). A number of hats in various styles, made of felt or woolen yarn, have been unearthed from burials. One of the burials, for example, yielded ten hats, each different (Barber 1999: 32–34). Several hats found in the Tarim basin seem to be comparable with the headgear depicted on the Yangshao pottery basins and figurines, including round hats made of yarn, very tall and pointed felt hats, short and pointed felt hats, and felt hats decorated with feathers (Figure 4.11: 9–11). It is obvious that many ethnic groups in Central Asia wore hats of various styles, and this custom may have been in part an adaptation to Central Asian desert environment. It is likely that people in the Xinjiang region also wore hats in various styles during the fifth and fourth millennium BC, as they did in later times. It is also possible that some of them, perhaps including ritual practitioners or magicians, may have traveled to the eastern regions, and left their images in the material remains at Yangshao sites.

Although the Caucasoid images found in Yangshao remains seem to support the supposition of cultural contacts with the West, it is uncertain whether Central Asian influence, in whatever form, played any important role in socio-political change in Neolithic China. Clay figurines were unearthed from all contexts in Chalcolithic and Bronze Age Central Asian sites, including refuse, domestic rooms, and monumental architecture. They were perhaps used in rituals, but there is no indication of centralized ritual activities focused on these figurines (Gupta 1979: 71, 95; Hiebert

1994: 141–143). In Neolithic China, we do not know whether or not these nonlocal individuals depicted in figurines were integrated into the Yangshao societies, or only wandered from village to village performing in local ceremonies. Physical anthropologists have not identified any Caucasoid skeletons in Yangshao populations. There is no evidence that ritual practitioners from Central Asia, if indeed present, contributed in any significant way to social changes as manifested in settlement nucleation and construction of public architecture for regional functions during the later Yangshao period. The dynamics of social change were more likely to derive from the indigenous Yangshao societies rather than from distant cultures.

As discussed in chapter 2, geological studies point to climatic deterioration after 4000 BC, probably as the result of the southward retreat of the East Asian monsoon. This change may have affected the economic subsistence of the Yangshao people who primarily relied on dry farming. A recent study of the diet and health of the Neolithic population in the Wei River region based on skeletal samples from several Yangshao sites suggests that the early Yangshao communities from Beiliu and Jiangzhai show relatively good diet with adequate meat intake, characterized by low frequency of anemia and carious lesions. Some subsistence changes may have occurred during the later phase of Yangshao culture (e.g., at Shijia) that resulted in elevated masticatory stress and occlusal macrowear, indicating a decline of community health (Pechenkina *et al.* 2002). Poor community health has also been observed at another Yangshao site at Hongshanmiao in Ruzhou, Henan, dating to the fourth millennium BC. Among fifty-seven human skeletons from this site, 17.6 percent have dental caries, 41.2 percent have periodontopathy, 17.6 percent have alveolar abscess, and 23.5 percent have hypoplastic enamel (Zhang Zhenbiao and Yuan 1995). It is possible that the increase of ritual-feasting ceremonies, associated with a decline of community health during the later phase of the Yangshao period, was a social and religious response to external stresses, such as instability of agricultural production caused by climatic fluctuation during the fourth millennium BC.

Fortified settlements: While settlement nucleation took place in the Wei River valley, three fortified settlements, enclosed by rammed-earth walls, appeared in the lower Yellow River region. The Wangzhuang (4 ha), Xikangliu (3.5 ha), and Dantu (9.5 ha) sites, all in Shandong, are dated to the Dawendou culture, and Xishan (estimated 25 ha) in Henan is dated to the late Yangshao culture (Shandong Institute 2001; Zhang Xuehai 1996b). Among them, the Xishan site is the largest and best reported (Figure 4.1).

Xishan is located on a terraced area by a river (Archaeological Team Leader 1999; Zhang Yushi and Yang 1995). The original walled settlement was an irregular round shape, but only the northern and western parts of the enclosure are preserved. The remaining walls, 265 m long, 3 to 5 m wide, and 1.75 to 2.5 m high, were all buried underground. The walls were surrounded by a moat, 4 to 11 m wide and 3 to 4.5 m deep. Two gates were located in the north and west. The north gate (10 m wide) was shielded with a section of wall (7 m long and 1.5 m wide). The excavated area of 6,385 m^2 yielded about 200 houses, 2,000 ash pits, 150 burials, and a large amount of artifacts and faunal and floral remains. A large architectural foundation (F84,

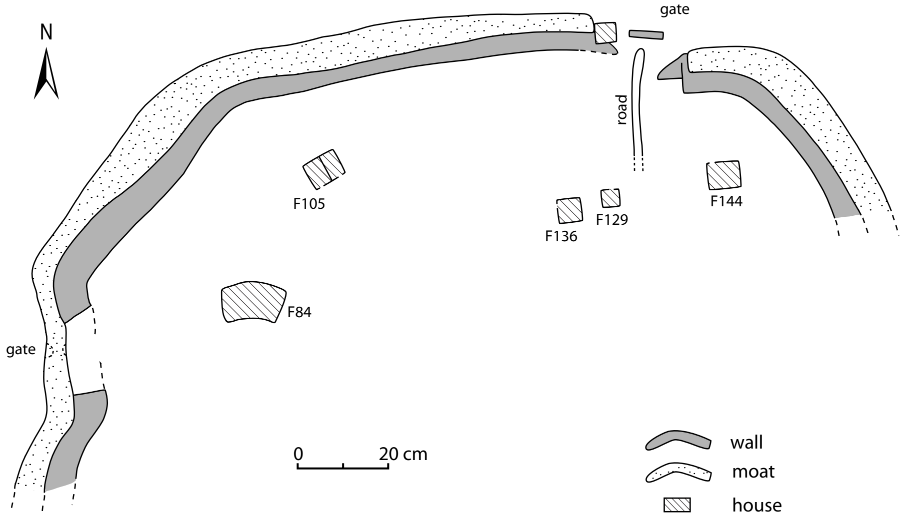


Figure 4.12 Layout of the late Yangshao walled settlement at Xishan, Henan (adapted from Archaeological Team 1999: fig. 10).

112 m^2 in size), perhaps a public building, was found in the western part of the town. Several other house foundations surrounded F84, and a large plaza of a few hundred square meters in area was found to the north of it (Figure 4.12). However, it is unclear whether a residential hierarchy existed in this walled site, due to lack of detailed published data.

Incomplete skeletons of children inside pottery jars, perhaps as human sacrifices, were found underneath foundations of houses and town walls. These probably resulted from foundation-laying rituals. Some ash pits contained adult human skeletons in postures of struggle and mixed with animal bones, indicating violence or warfare. More than 20 pits also contained whole skeletons of animals, such as pigs and cattle, suggesting frequent ritual activities involving the use of animal sacrifices (Archaeological Team 1999).

Some artifacts stylistically non-native to the Central Plains are relatable to the Dawenkou culture in Shandong and Qujialing culture in Hubei. While the Xishan site dates to the entire Yangshao culture, the rammed-earth enclosure was constructed at the beginning of the late Yangshao period and ceased to function before the end of late Yangshao (Zhang Yushi and Yang 1995). The enclosure was contemporary with the non-local cultural elements, suggesting that cultural interaction, perhaps including inter-group conflict, played an important role in the construction of the fortification.

The emergence of rammed-earth walled settlements in Chinese prehistory has been viewed by Chinese archaeologists as a significant milestone in the process of cultural evolution. It implies the achievement of a certain level of technology, social organization, and leadership. Fortification later became an important component of urban planning in ancient China. However, walled sites occurred in this period only in isolated instances. Not until the late Longshan culture did the erection of fortifications become prevalent. As we will see below, major changes initiated in the middle and late Yangshao period – nucleation of large settlements and construction of fortifications – later became the two most important features in settlement patterns of the Longshan period.

Settlement organization in the late Neolithic period

More varieties of house structure appeared in the late Neolithic period and some major changes in settlement organization also occurred, especially during late Longshan. These are characterized by the emergence of three phenomena: compound-like house clusters, systems of walled settlements, and very large settlements (>200 ha).

Architectural forms

During the late Neolithic period the architectural forms in different regions show more variability than uniformity. Some new types of house structure and new architectural materials, such as sun-dried bricks, also occurred. Lime finishing on house floors, first appearing in the late Yangshao period, became widespread in many regions by the late Longshan. The types of house structure found in central Shaanxi, southern Shanxi, and Henan include: (1) square-/rectangular-shaped houses; (2) round-shaped houses; (3) rectangular-shaped town houses in alluvial plains in Henan and Shaanxi (Institute of Archaeology 2001; Xi'an Banpo Museum 1985); (4) cave dwellings in the loess areas (Fu Shumin 1992; Hu and Zhang 2000; Shandong Institute 1985: 480; Shandong University 1990: 17–32); and (5) terraced-foundation buildings (Shandong Museum 1976), sometimes appearing within a palatial complex (Henan Institute 2002b). The last variant is especially notable, since later in the dynastic period palaces were often built on terraced foundations to show grant appeals.

Two factors, in particular, could have affected the adoption of different types of house structures. First, there are ecological and environmental conditions. For example, earthen cave dwellings only occurred in the Loess Plateaus, in which the cave dwellings were made either by penetrating natural mounds or by digging a large ditch on a flat ground surface, then digging caves into the vertical walls of the ditch (Fu 1989; Hu and Zhang 2000). The earthen cave dwellings are warm in winter and cool in summer and have been the major type of shelter built in the Loess Plateau region up to the present time (Golany 1990). Lime-finished houses have often been found in lowland areas. At many sites in Shaanxi and Henan, such as Kangjia (chapter 3), several layers of lime floor are stratified one above the other, indicating that the houses were rebuilt many times over a long period. Possible explanations of this phenomenon may be humid climatic conditions or a high water table in areas where those sites were located.

The second type of factors that could have affected the adoption of different styles of house structure is cultural. For example, lime-floored houses became prevalent throughout most regions of the Yellow River valley in late Longshan, but they never reached the east coast areas of Shandong. The people in this area seem to have not been much influenced by their western neighbors; this is indicated by the fact that other cultural traits such as certain pottery forms widespread in western regions – for example, the *li* tripod – rarely occurred in the east coast areas (Han 1989: 150–152; Wu Ruzuo and Du 1984).

Settlement organization

During the late Neolithic period the majority of sites were small villages, some medium-size sites were fortified with rammed-earth enclosures, and a few were very large settlements, with fortifications. Many of these medium and large sites appear to have had important economic and political functions in their immediate regions. Below I discuss several well-documented sites in three categories: medium sites without walls, medium sites with walls, and large sites (>200 ha) with or without walls.

Medium settlements without walls Most sites under study have only been partially excavated; therefore, the spatial forms of the entire settlement are often unclear, and the data for studying the settlement organization of these sites are fragmentary. The discussion here, therefore, is mainly based on two sites which provide relatively detailed information on settlement patterns – Yuchisi in Anhui and Kangjia in Shaanxi.

Yuchisi is a late Dawenkou culture site in Mengcheng, north Anhui, dating to ca. 2800–2600 BC (Figure 4.1). The site is located on a mound (*gudui*), a few meters higher than the surrounding areas. It was bounded by a moat measuring 25 to 30 m wide and 4.5 m deep. The entire site is nearly 10 ha, but the area inside the moat is about 5 ha (Institute of Archaeology 2001). Yuchisi was probably the central place of sixteen other small contemporary settlements (3.2 ha or less), together forming a site cluster in the region (Institute of Archaeology 1996) (Figure 4.13).

The moat was probably the water source for the Yuchisi habitants, since pottery sherds uncovered from the moat show clear traits of water erosion and no water well has been found at the site (Institute of Archaeology 2001). The moat may thus have connected to a river system, probably the Beifei River 2 km south of the site (Figure 4.13), and also functioned as a transportation facility.

Ten seasons of excavation since 1989 have revealed a nearly complete settlement layout at Yuchisi, composed of more than 200 burials, a few dozen pits and 55 buildings. All the buildings were burnt down before the entire settlement was abandoned, and this abandonment process allowed many artifacts and features in the residential areas to be well preserved. Most buildings were arranged in rows, ranging from two to thirteen in each row, and distributed in nine groups. 41 buildings excavated in the 1989 to 1995 seasons include two types: 30 dwellings (10 to 32 m^2 in size) indicated by the presence of a hearth in each of them, and 11 storage rooms (mostly 4 to 5 m^2 in size) with no hearth found inside (Institute of Archaeology 2001). The ratio between these two types of buildings is 3.7:1. 14 buildings uncovered in the 2001 season have only been briefly reported, with no details on type or size (Wang Jihuai and Zhang 2001). Based on the dwelling-storage ratio calculated above, there

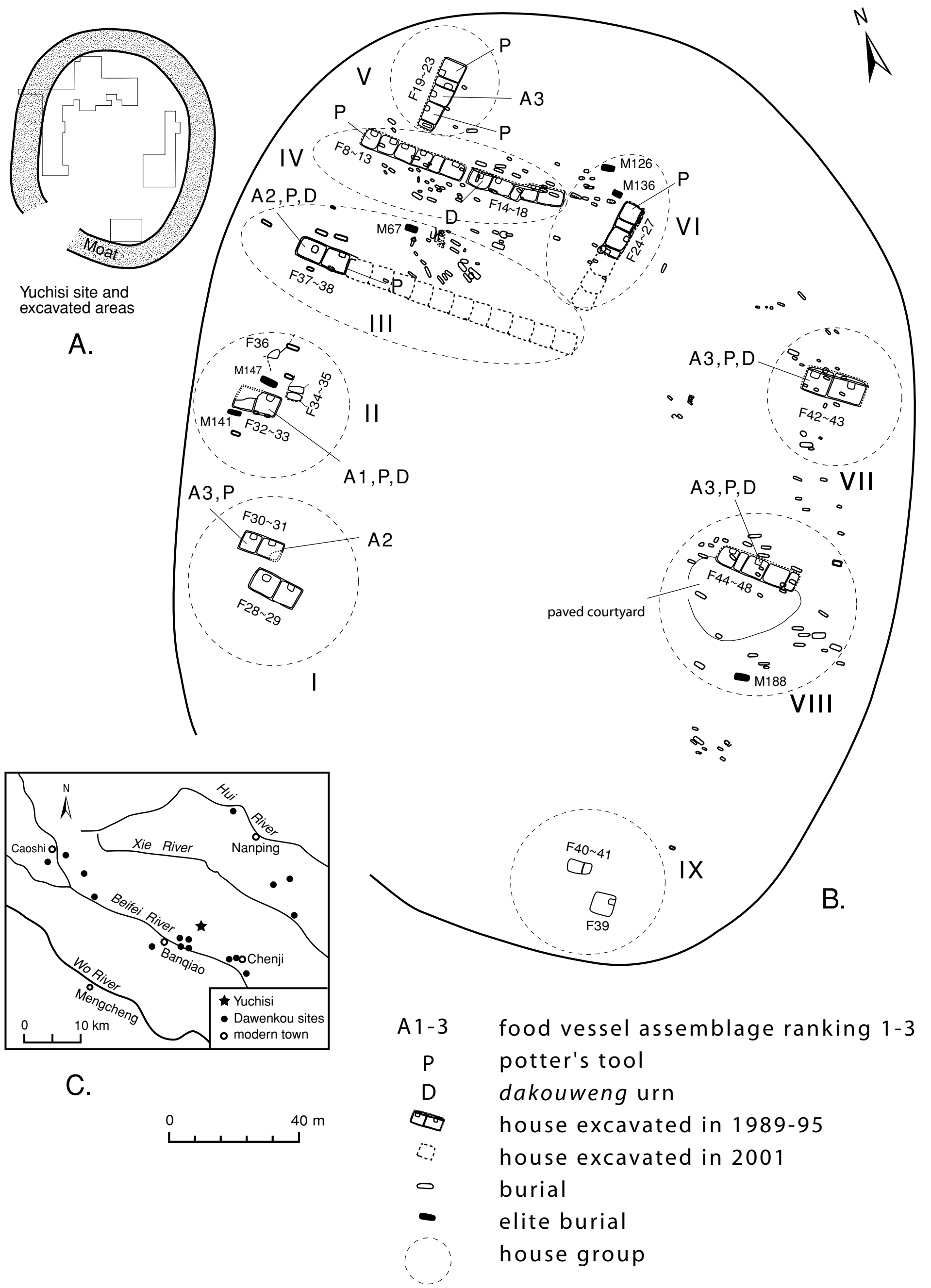


Figure 4.13 (A) The Yuchisi site surrounded by a moat; (B) the layout of Yuchisi settlement, noting that pits are not shown in the map; (C) Yuchisi and other small sites in Mengcheng, Anhui, late Dawenkou culture (adapted from Institute of Archaeology 1996: fig. 2, 2001: figs. 5, 77–81).

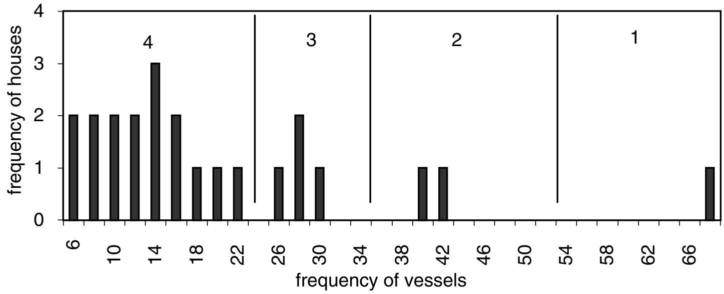


Figure 4.14 Histogram showing four rankings in the distribution of food vessels in residential dwellings at Yuchisi in Mengcheng, Anhui, late Dawenkou culture.

may have been 10 small dwellings and 4 storage rooms. Therefore, altogether 40 dwellings have been unearthed so far. Each house cluster was associated with a front courtyard paved with burnt clay, and a number of burials and pits were uncovered around houses (Figure 4.13). Together these features represent the material remains from several closely related kin groups in this settlement.

The Yuchisi population size may be estimated based on the size and number of buildings. If each dwelling accommodated between 4 and 6 people, the total population at Yuchisi based on the dwelling areas is therefore estimated as between 160 and 240 people, at an average of 200. The population density, with 5 ha of the residential area inside the moat, ranges from 32 to 48 persons per ha, at an average of 40. This estimated population size at Yuchisi is probably lower than the real situation, since the site has not been completely excavated and more houses may be uncovered in future.

Pottery vessels and tools were commonly found in all features. Based on the quantities of food vessels in house floors, the dwellings can be classified into four ranks: (1) house F33 containing 68 food vessels; (2) houses F31 and 37, each containing more than 40 artifacts; (3) houses F21, 30, 42 and 46, each containing 26 to 30 vessels; and (4) all other houses, each with less than 22 vessels (Figure 4.14). Among pottery vessels, as discussed in chapter 3, *dakouweng* urns were somewhat special in function. Four out of five such urns were unearthed from houses which are classified as vessel-rich dwellings (F33, 37, 42, and 46).

Ceramic vessels from Yuchisi were mostly handmade, with a small proportion made of slow-wheel techniques. There are seventeen types of vessel, each of which can be further classified into two to five sub-types (Institute of Archaeology 2001: 120–163). Although no statistic analysis has been conducted to quantify the variability of these vessels, their numerous types recognized by the excavators suggest a low level of standardization in production. Potter's tools are present in nine houses (F30, 33, 37, 8,19, 23, 27, 42 and 46), which are distributed in most house groups at the site. This phenomenon suggests that pottery manufacture was conducted by many households as a craft specialization undertaken by the community. Therefore, the high variability of vessel forms conforms to the decentralized mode of ceramic production. Considering that Yuchisi is located in a central place surrounded by many small sites (Figure 4.13), from which ceramic remains are similar in style but no potter's tools have been found (Institute of Archaeology 1996), it is possible that Yuchisi was a ceramic manufacturing center which provided pottery products to other communities in the region. This proposition however still needs to be tested in future studies.

Most lithic materials came from the surrounding mountainous regions within a radius of 100 km (Xie Shuoyong 2001). Although at least one tool blank (spade) was found at the site (Institute of Archaeology 2001), there is little evidence that most of the stone tools were produced on site. The Yuchisi people may have obtained stone tools from other communities.

It is notable that only four houses at Yuchisi, distributed in clusters II, III, VII and VIII, show all three elements: potter's tools, *dakouweng*, and a large quantity of food vessels (>26) (Figure 4.13). As discussed in chapter 3, excessive numbers of food vessels in a house perhaps indicate frequent feasts conducted by the household. The scattered distribution of such households in several house groups suggests that feasting was a part of competitive emulation behavior adopted by several kin groups in this community.

Among 192 burials excavated in the first nine seasons, 75.6 percent contained grave goods (1 to 29 items), including mainly vessels and tools. About 6.8 percent of burials contained special grave goods, such as jade pendants, pig mandibles and deer tusks. Jades were most probably obtained through long-distance exchange, since there was no jade source in the region (Xie Shuoyong 2001). Jade and pig mandibles, which may have been status markers, appeared in many Neolithic burial sites in the east coast region (see chapter 5). Deer tusks, which were not necessarily prestige goods in other Dawenkou burials (Luan 1997b), mostly co-occur with jade and pig mandibles at Yuchisi, indicating some special symbolic meanings.

As analyzed in detail in chapter 5, six burials at Yuchisi appear to be outstanding in both the quantity and quality of grave goods: they each contained 13 to 29 grave goods with a concentration of the above-mentioned special items (Figure 5.20B–C). While both sexes occur in these high-ranking burials (two females and four males), the two most elaborate ones belong to males, all located in cluster VI. Interestingly, these six high-ranking burials were distributed in four house clusters II, III, VI and VIII, largely coinciding with the house clusters which included houses with the most abundant food vessels (clusters II, III, VII and VIII) (Figure 4.13).

The Yuchisi settlement was apparently carefully planned in terms of its well-organized and closely spaced house layout and homogeneous architectural style. According to Chang's (1958: 306) study of Neolithic village patterns, there is a high degree of correlation between community plans and kinship organization, and the planned village pattern positively indicates a monolineage community. It thus is likely that the Yuchisi settlement comprised a monolineage community. However, many Yanshao settlements, such as Jiangzhai, Banpo, and Beishuoling, were also well planned, and they may have been organized monolineally as well. It is not clear to what extent the monolineage organization of the Yuchisi community is different from that of those Yangshao communities. The change of settlement form *per se* does not provide much information indicating a change from matrilineal to patrilineal organization, as some Chinese archaeologists have assumed (chapter 1).

Putting all the information together, we can now attempt to reconstruct the social organization of the Yuchisi community. There is no evidence for a centralized hierarchical system in this community, since the high-ranking burials and rich houses were distributed in most sectors of the village with a decentralized pattern. However, there were individuals in each kin group who enjoyed relatively high social status, and received more elaborate mortuary treatments than other members of the community. If Yuchisi was a central place in its immediate region, the ceramic manufacture at this center may have held an important economic role in its relationship with other villages in this region. Yuchisi apparently also depended on other settlements for necessary material goods, such as stone tools. The occurrence of jades as grave goods, especially in high-ranking burials, suggests inter-regional interaction for exchange of elite items, although it may not have been practiced very frequently. It is therefore most likely that a number of kin groups in this community were competing for power and prestige through competitive feasting, craft production, and access to external resources such as stone tools and jades.

Yuchisi may be described as a community in which factional competition dominated the relationships among kin-groups. Factions are defined as functionally similar groups which compete for resources and positions of power or prestige (Brumfiel 1994), and the formation of competing factions within communities goes hand in hand with the development of alliances between faction leaders in different communities (Spencer 1994). Yuchisi, which expresses all these characteristics, represents a transegalitarian society developing toward a more complex social organization before the community abandoned its settlement around 2600 BC

Kangjia, as briefly noted in chapter 3, is a well-preserved settlement site in Lintong, Shaanxi, dating to the late Longshan period (Figure 4.1). It covers an area of about 19 ha, possibly surrounded by a ditch (Kangjia Team 1988, 1992; Xi'an Banpo Museum 1985). Within the site, well-organized domestic structures were built. Most houses were concentrated in the southeastern and southwestern parts of the site and some were scattered in the northern and western parts. No structural remains have been found at the center of the site, a fact which suggests the existence of a central plaza (Figure 3.12). Kangjia was a medium-size village, perhaps a regional center (see chapter 6).

The Longshan cultural deposits are thick (3 to 4 m), and multiple house foundations were found stratified one above the other, suggesting a long period of occupation there. These houses, all facing south, were built of rammed earth and sun-dried clay bricks. They were mostly square in floor plan, and averaged 9 to 12 m^2 in floor area. Storage facilities, which later became garbage dumps known to archaeologists as "ash pits," surrounded the houses. In the southern part of the site, more than 280 superimposed houses have been excavated. With few exceptions, houses in the upper stratum tended to be larger and more numerous than those in the lower stratum, suggesting a gradual increase in population density.

In the upper stratum, 7 rows of houses, with distances of 6 to 9 m between rows, have been found, each row divided into several groups. Each group consists of 2 to 6 houses, which all share a common courtyard. Some house groups are separated from others by an earthen enclosure, forming compound-like linear-layout clusters. Each row of houses varied in length, measuring from 8 m with 2 rooms to more than 25 m with 6 rooms.

Population size may be estimated based on the spatial distribution of residential structures. The southeastern part of the site has been most intensively excavated and cored. The excavated areas, measuring 119 m in length, revealed 30 rooms, each one an average of 4 m in length. The areas with lime floors determined by coring measured 248 m in total length, which may have been composed of about 62 rooms, based on the above calculation. The houses in the southeastern part of the site, therefore, may have had about 92 rooms. If between 3 and 4 persons on average occupied each room, the population in this part of the site may have been between 276 and 368 persons, with an average of 322 persons. The house densities in other parts of the site appear to be much lower according to the coring results, with the areas of lime floors measuring 204 m in length, perhaps containing about 51 rooms. Such a scattered distribution of houses in the archaeological record may be a result of the less intensive coring and excavation carried out in these areas than in the southeastern part of the site. Taking consideration of sampling problems, the residential density revealed in the southeastern sector may be applied to the other two sectors at the site. If Kangjia were occupied by three residential sectors with relatively similar levels of population density, the entire population of the settlement may have been between 828 and 1,104 persons, with an average of 966 persons, at a population density of 51 persons per ha. This figure is very close to that for Jiangzhai (53.5 persons), as described above.

Compared to the Yangshao settlement layout and community economy in the Wei River valley, a major change is that the individual household seems to have become the basic unit of production. That some courtyards were walled off from the rest of the village suggests that the working space of some families had become private. This situation has been seen in other Longshan sites. For example, Zhaojialai in Wugong, Shaanxi (Figure 4.1), yielded an example of this kind of house layout. It was a multi-roomed cave-dwelling compound (Institute of Archaeology 1988b: 98–116), which included at least two units. Each unit had its own courtyard and was separated from others by earthen enclosures; a livestock pen was found inside one of the courtyards (Liang and Li 1991), indicating that the livestock was owned by the household (Figure 4.15). This type of settlement layout is in sharp contrast to the Banpo and Jiangzhai sites, in which all the small and medium houses were facing the large communal building in a centripetal pattern. Pottery making was a local craft production at Kangjia. Three kilns and many potter's tools were found in the southeastern part of the site, and one of the kilns, whose location was mentioned in the report, was near a house (Kangjia Team 1988). This suggests that ceramic production was the specialized function of some households in the community. The technologies of pottery making in the Longshan culture include hand-made, mold,

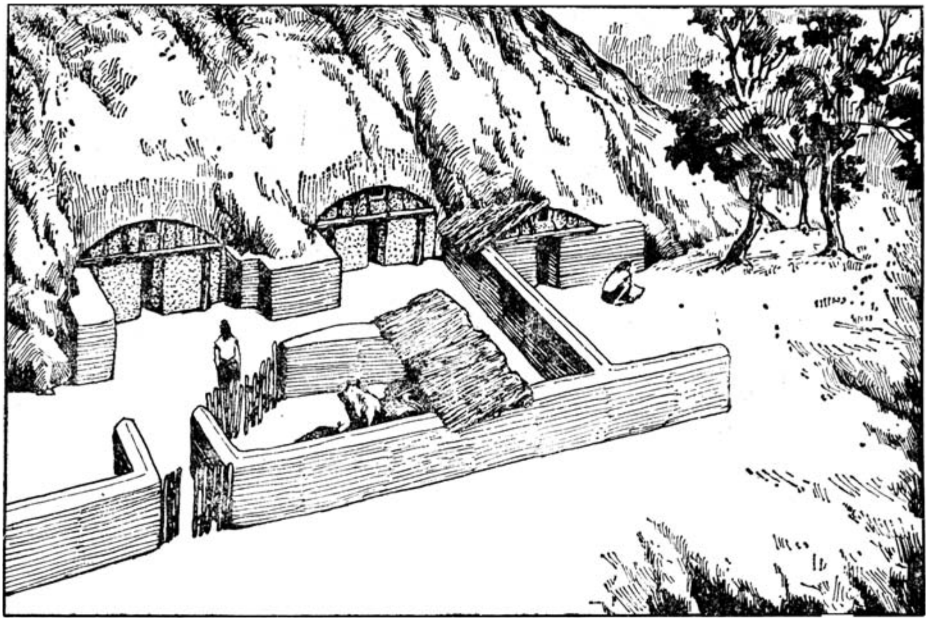


Figure 4.15 Artistic reconstruction of a house compound at Zhaojialai in Shaanxi, late Longshan period (after Liang and Li 1991: fig. 2; with permission from the Institute of Archaeology, CASS).

and fast-wheel. The mold techniques for making hollow-legged vessels, such as *li* and *jia*, were particularly prevalent in the middle Yellow River region, while the fast-wheel techniques were more commonly employed in the lower Yellow River region (Li 1996: 1–24). These newly developed ceramic techniques also manifest a higher level of craft specialization during the Longshan period.

Inter-community trade was also present. Bone and shell tools were likely made locally, while stone tools were probably obtained from villages near the Lishan Mountains where lithic resources were available. Among the 360 artifacts made of stone, bone, shell, and pottery discovered in the 1985 and 1990 excavation seasons, stone artifacts make up 30 percent of the tool assemblages. This figure is much lower than those from sites near stone resources, such as Huizui in Yanshi, Henan, at which stone implements make 49 percent of the Longshan tool assemblage (Henan Institute 1990) (Appendix 6.1). Limestone for making lime plaster on room floors was only available in the Beishan Mountains, about 50 km to the north. The lack of lithic materials was one of the reasons that the Kangjia community exchanged utilitarian items with other regions.

Although settlement layout at Kangjia does not suggest any pronounced residential segregation, the household in T26 yielded some material remains, as described in chapter 3, that may indicate the emergence of social inequalities. These include animal images painted on house floors and exotic ritual goods (turtle shells) which were absent in other parts of the site, faunal remains indicating ritual-feasting activities, and a high frequency of human skeletons in ash pits which may have been associated with human sacrifice. These ritual activities were associated with individual households, suggesting a shift in ritual practice from community-oriented activities in the Yangshao period (as shown by public buildings found at Jiangzhai, Xipo, Dadiwan, and Anban) to household-oriented ones in the Longshan period. This issue is further discussed in chapter 5, based on mortuary information.

Medium settlements with walls More than a dozen Longshan sites fortified with rammed-earth enclosures have been found in the region under review, including at least eleven in Shandong and six in Henan (chapters 6 and 7). Since most of these sites have not been fully reported, discussion here focuses on three sites – Pingliangtai, Wangchenggang, and Guchengzhai, all in Henan (Figure 4.1).

Pingliangtai, excavated in 1979–1980 (Henan Institute 1983b), is located on an elevated flat mound in Huaiyang county. The site covers an area of 5 ha, in which five phases ranging from the late Dawenkou period to the Erlitou culture are identified (ca. 3000–1500 BC), and Phases II to IV belong to the middle and late Longshan culture.

Pingliangtai was enclosed by rammed-earth walls, measuring about 185 m along each side of the enclosure and covering over 3.4 ha in area (Figure 4.16). The remaining walls measure over 3 m tall, 13 m wide at the base, and 8 to 10 m wide at the top. The walls, dated to Phase III (ca. 2550 BC), were used for a short period, judging from the fact that the walls were covered by cultural remains of the same phase (Cao 1994b: 145; Henan Institute 1983b).

Two gates were found at the center of both the north and south walls, and the south gate was flanked by two structures made of sun-dried clay bricks, probably used as guardhouses (Figure 4.16). A section of an underground drainage channel over 5 m long, consisting of several ceramic pipes, was found 0.3 m below the road surface in the south gate. More than a dozen rectangular buildings, arranged

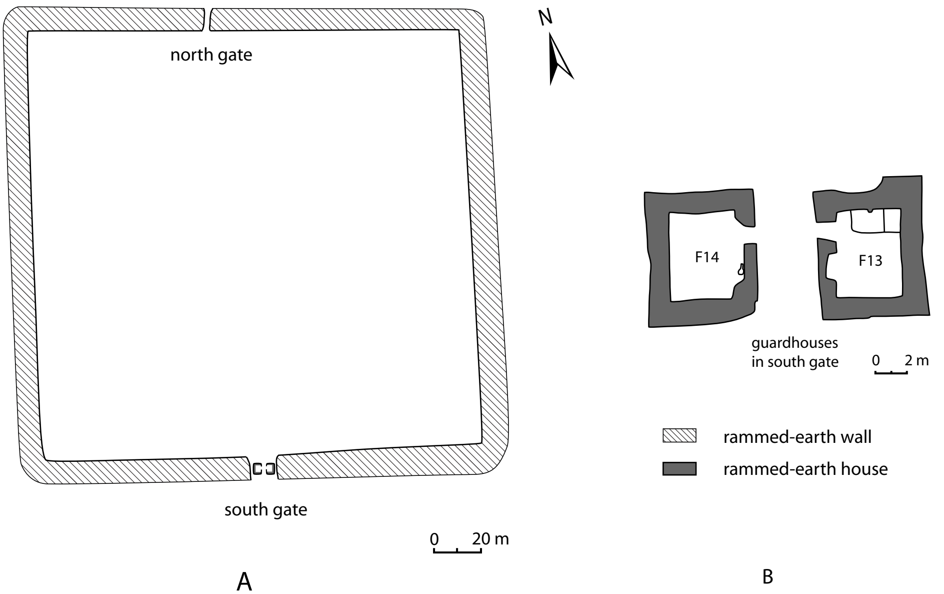


Figure 4.16 (A) Plan of the Pingliangtai walled site, and (B) the guardhouse in its southern gate, late Longshan period (adapted from Henan Institute 1983b: figs. 16, 18).

in contiguous rows, have been found inside the enclosure. Other features include sixteen infant burials, three pottery kilns, and two storage pits. A small piece of copper-alloyed metal was unearthed from a pit, 1.3 cm long, and 0.8 cm thick with almost a square-shaped cross-section; its mineral components have not been tested. Although it is often referred to as slag, some scholars suggest that it may be part of a metal artifact (Hua 1999: 16). Pingliangtai is one of the sites which yielded possibly the earliest metal remains in the Central Plains (An 1993b), although it is far from clear where the metal production occurred. Indicated by the find of three kilns at Pingliangtai, at least one type of craft production, pottery making, was carried out there.

Judging from the remains of the drainage system, guardhouses, and craft production, it is clear that Pingliangtai was a well-designed walled town, which may have been occupied by a community with a certain degree of complexity in craft specialization and socio-political organization. The town walls were used for a short period, but the site continued to be occupied after the walls ceased to function as an effective barrier during the late Longshan period.

Wangchenggang in Dengfeng is located on a terraced area in the alluvial region southeast of the Songshan Mountains in the upper Ying River valley. The site, with a residual size of 1 ha, consisted of two connected rammed-earth enclosures along an east–west axis (Figure 4.17). While the western enclosure contains an area of about

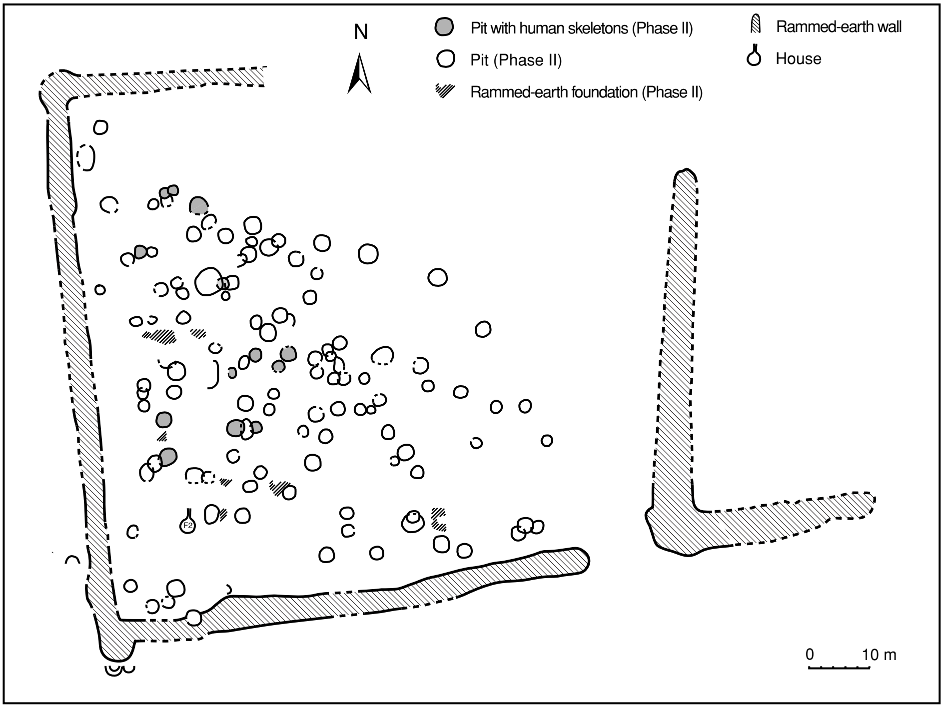


Figure 4.17 Plan of the Wangchenggang walled site, late Longshan period (adapted from Henan Institute 1992a: fig. 18).

8,500 m^2, the eastern enclosure, most of which was destroyed by the Wudu River to the east, may have originally been of a size similar to the western one (Henan Institute 1992a). More residential areas were distributed outside the enclosures, according to the most recent investigations, and the entire site size is about 50 ha in area (Fang 2002).

The cultural remains cover a long span from the Peiligang culture of the early Neolithic, to the Eastern Zhou period (ca. 6000–400 BC). The Longshan culture at this site is divided into five phases. During Phase II rammed-earth enclosures were built at the site (ca. 2455–2280 BC) (Cao Guicen 1994: 145). The walls enclosed a residential area, indicated by remains of several rammed-earth foundations and finds of 101 ash pits which contained large numbers of implements and pottery (Henan Institute 1992a: 28–63). Human sacrifices including children and adults of at least 17 complete and a few dismembered skeletons were found in 13 sacrificial pits under the structural foundations. Perhaps they were dug in connection with foundation-laying ceremonies (Figure 4.17). In pit H1, for example, seven skeletons were buried in the rammed-earth deposits (Figure 3.9). The walls were probably destroyed in Phase III (Dong 1984, 1988), but the settlement continued to be populated densely, judging from 149 ash pits (some of them were probably houses) found at the site. Afterwards Wangchenggang witnessed the beginning of a population decline, as only 40 ash pits were dated to Phase IV and 3 to Phase V.

Wangchenggang appears to have been a craft-production center. Semi-finished stone tools (including spades, knives, and sickles) and grinding-stone slabs were found from deposits dating to Longshan Phases II–IV. Most of the tools were made of limestone, which may have been obtained from the Songshan Mountains a few kilometers from the site (Henan Institute 1992a). Wangchenggang is located about 1 km south of a small mount formed of sandstone, which could provide ideal grinding stones to facilitate ground stone-tool production. The stone artifacts make up 68 percent of the entire tool assemblage (including tools made of stone, bone, shell, and pottery) unearthed from the Longshan strata at Wangchenggang. This figure is higher than corresponding ratios both at the non-stone tool-production site, Kangjia (30 percent), as discussed above, and also at the stone tool-production site, Huizui in Yanshi (49%) (Liu, L. *et al.* 2002–2004) (Appendix 6.1).

Another interesting find at Wangchenggang was a pit dating to Phase IV, which contained 70 pots and 44 ceramic spindle whorls. The latter suggests that a certain level of textile specialization existed in this settlement. No evidence for ceramic production was present at the site, indicating that ceramics were obtained from elsewhere. A bronze fragment was also found from Phase IV deposits. Although it is too small to tell the original shape of the object, the presence of a bronze artifact, which seems to have been an extremely rare item during this time period, suggests that the settlement had some special status (Henan Institute 1992a: 85–87).

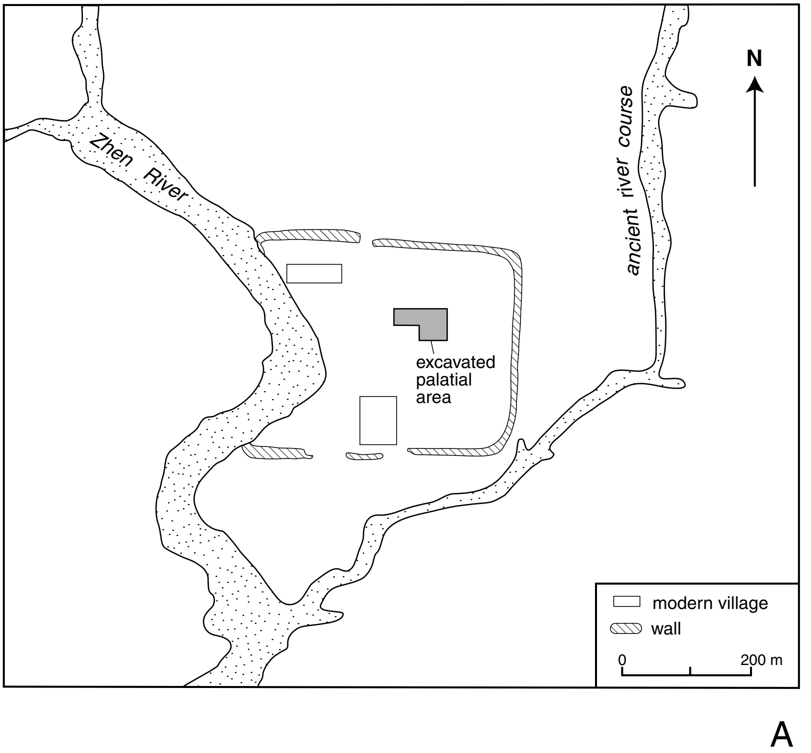
Since its discovery, Wangchenggang has been the focus of attention of Chinese archaeologists. Many believe, based on textual records, that Wangchenggang was Yangcheng, the capital city established by Yu the Great who founded the Xia dynasty.

This conclusion has been made primarily because the Wangchenggang enclosure was constructed earlier than the Erlitou site, which is believed to be the capital of the late Xia dynasty; evidence of human sacrifice found at the site points to a slave-based society, a characteristic of early states according to Marxist evolutionary theory; the name Wangchenggang means "the terrace of king's city," which suggests the ancient memory of an early dynastic city by the locals; and finally, an Eastern Zhou city near Wangchenggang was indeed named Yangcheng, identified by pottery inscriptions found at the site (Henan Institute 1992a: 320–324). Although we cannot rule out the possibility that this settlement played an important role in the political formation of the region at some point in time, its historical relationship with the Xia remains to be investigated archaeologically. In any case, compared to the short life span of the walls and the practice of human sacrifice (only during Phase II), the presence of craft production is more enduring (Phases II–IV). Wangchenggang was thus more probably a settlement developed for economic functions.

Guchengzhai in Xinmi county is located on a terrace 2 to 5 m above surrounding land in the confluence of two ancient rivers (only the Zhen River in the west exists today). It is surrounded by a rammed-earth enclosure, which is up to 40 m wide on its base and stands up to 15 m high above the ground today. There are two entrances situated in the middle of the northern and southern walls. The Zhen River destroyed the western wall, and the original area of the enclosure was about 17 ha. The site was periodically occupied through the Yangshao, Longshan, Erlitou, Shang, and subsequent periods, but the main occupation dates to the Longshan (Figure 4.18). Archaeologists divided the Longshan deposits into four phases dating from early Longshan to the Xinzhai phases (ca. 3000–1900 BC), and the rammed-earth walls were initially constructed in Phase II (contemporary with Wangchenggang Phase III) in the early part of the late Longshan period (ca. 2300 BC) (Cai *et al.* 2000; Henan Institute 2002b).

Archaeologists recently excavated a large palatial compound, contemporaneous with the enclosure, at the northeastern part of the walled site. It consists of a rammed-earth architectural foundation, measuring 383.4 m^2 in area (28.4 m long and 13.5 m wide), which was embraced by porches on three sides as indicated by postholes. The architecture was connected to corridors made of rammed-earth and wattle-and-daub walls, which surround the compound. The corridors have been excavated only partially, and at least three entrances were located at the northern and western walls. A dog skeleton was found in a sacrificial pit associated with the foundation of the corridors (Figure 4.18). Some ash pits containing pottery vessels and tools were found near, and contemporary with, the palatial compound (e.g., pit IVH5), suggesting that this building was a residential structure. The rammed-earth enclosure and palatial compound appear to have been abandoned near the end of the late Longshan period, judging from the intrusion of pits dating to Phase III. The Longshan material remains are distributed both inside and outside the enclosure (Cai *et al.* 2000; Henan Institute 2002b).

The construction of corridors surrounding the courtyard and the large building is a new type of architecture. It creates a closed architectural system, which is very



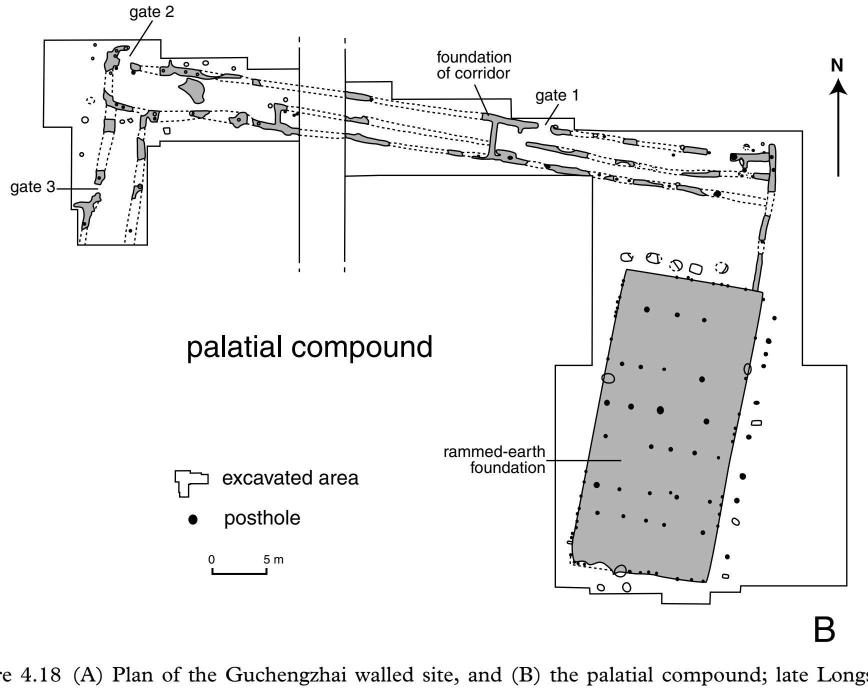


Figure 4.18 (A) Plan of the Guchengzhai walled site, and (B) the palatial compound; late Longshan period (adapted from Henan Institute 2002b: figs. 2, 5).

different from the public building with an open courtyard built in previous periods. These corridors may have been intended to further segregate the activities of the elite within the compound from those of the population outside. Further excavation may provide better understanding about the function of the building. At any rate, Guchengzhai reveals the best evidence for the emergence of residential segregation during the Longshan period, indicating that the public building became the elite residence and the community was spatially separated by the walls. More importantly, this architectural form preceded that of the palatial complex of the Erlitou state (chapter 8).

Chinese archaeologists have claimed that Guchengzhai was a bronze production site (Henan Institute 2002b). However, what have been found so far at the site are many fragments of crucibles, mostly outside the walled enclosure; but slag, which would confirm the metallurgical function of these crucibles, is absent. It remains to be studied in future if Guchengzhai was related to casting metal objects or merely manufacturing crucibles.

Large settlements with or without walls Only two Longshan sites over 200 ha have been found in the Yellow River region – Liangchengzhen in Shandong and Taosi in Shanxi.

Liangchengzhen is located on the floodplain of the Rizhao district in Shandong, about 5 km west of the coastline today (Figure 4.1). This site has been the focus of archaeological investigations since the 1930s (Gao Guangren 2000), and the recent Sino-American collaborative project has revealed much new information about this largest site in the Shandong region (Sino-American Collaborative Liangcheng 1997, 2002; Underhill *et al.* 1998; Underhill *et al.* 2002). The site measures 246 ha in area, and a large area of rammed-earth deposits, 2 to 2.5 m deep, has been found in the central part of the site, suggesting the existence of either large architectural foundations or walls (Sino-American Collaborative Liangcheng 1997: 3).

Liangchengzhen may have been a center for producing labor-intensive prestige goods. Two pits of jades were found at the site, including semi-finished as well as finished products; moreover, sherds of egg-shell pottery goblets, which were most likely used in funerary rituals and then buried as grave goods in rich tombs (see chapter 5), were also found in abundance there (Gao Guangren 2000; Liu Dunyuan 1972; Yin 1955). Jade items and egg-shell pottery goblets were probably exchanged as status symbols among elites (see chapter 5). As the production center of these items Liangchengzhen would have assumed an important political position in the region.

In addition, Liangchengzhen was also engaged in stone-tool production (Underhill *et al.* 1998: 464), as indicated by a large number of semi-finished stone artifacts, small flakes, debitage, and a considerable portion of small fragments of sandstone grinding palettes (for grinding stone tools) unearthed at the site. Among twenty-five raw material types identified from the lithic artifacts, three are the most recurrent (77.7% of the total number of tools): sandstone, greenstone, and quartzite. Sandstone sources are located at least 25 km northwest from Liangchengzhen, while two other major lithic materials are available in areas 1.5 km and further from the site (Bennett

2002). Given that stone tools were one of the most needed utilitarian items for the daily life of Neolithic people, Liangchengzhen must have possessed a tremendous economic significance in the region. It is also possible that the location of this regional center was chosen because of its relatively easy access to the lithic raw materials; it was also close to seaborne transportation routes.

Taosi, located in the Linfen basin, south Shanxi (Figure 4.1), is the largest Neolithic site so far found in the Yellow River valley (300 ha in area). It is situated on sloping land to the north of the Taer Mountains. The Linfen basin is surrounded by mountain ranges on all sides, and some of them contain copper and lead (Hydraulic Ministry 1987: 116–122) (Figure 4.19). Several large gullies have been

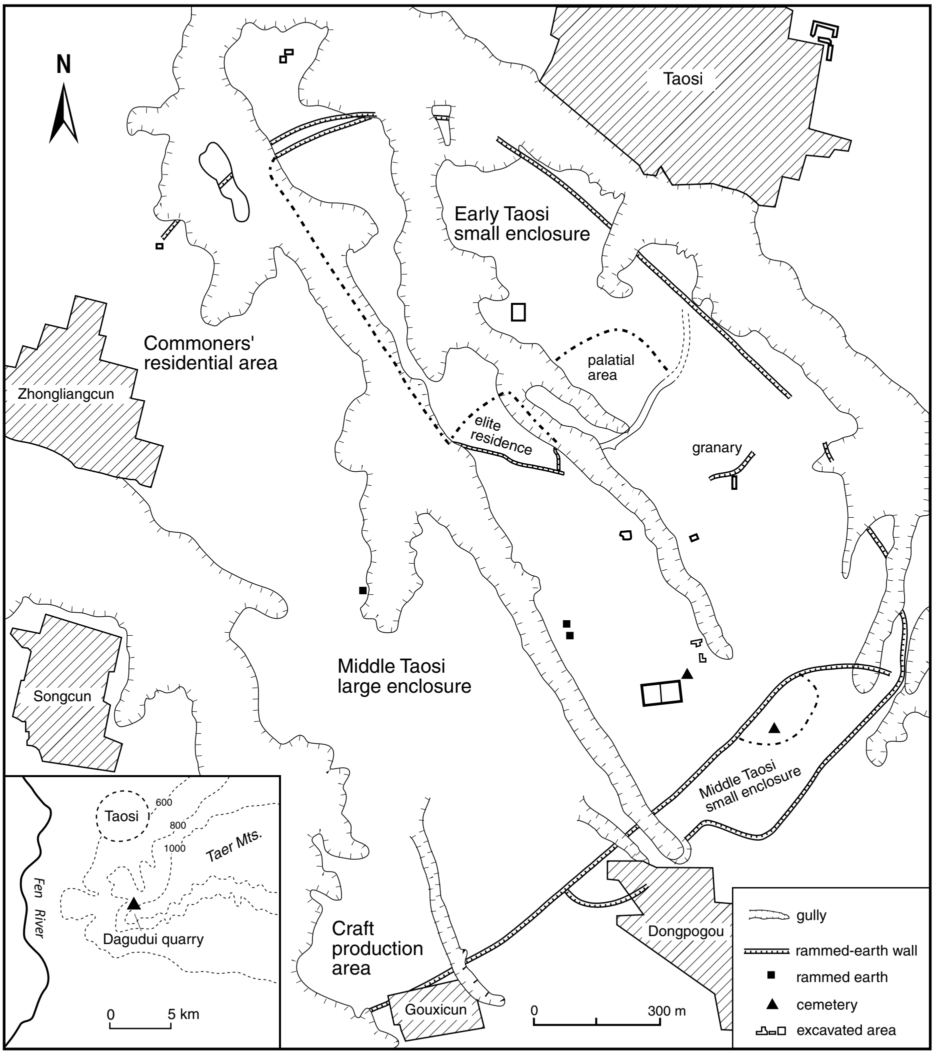


Figure 4.19 Plan of the Taosi walled site, and the location of Taosi in relation to the quarry at Mount Dagudui (lower left insert) (adapted from Shanxi Team *et al.* 2003: fig. 3; Tao 1991: fig. 1).

cut through the landscape, as the result of severe soil erosion in this loess region, which destroyed much of the site. Taosi has been excavated extensively during the recent three decades, revealing a wealth of data about this important site (He Nu and Yan 2002; Shanxi Team 1980b, 1983, 1986; Shanxi Team *et al.* 2003a; Shanxi Team and Shanxi Linfen 2003), although a detailed excavation report has not been published.

Taosi is dated to ca. 2600–2000 BC, and divided into early, middle, and late phases. During the early phase, a rammed-earth enclosure, measuring 56 ha in area and 4.5 m in residual width, was constructed in the northeastern part of the site. A palatial area (5 ha) and an elite residential area (1.6 ha) have been found in the southern section of this enclosure, as indicated by remains of painted wall plasters and large rammed-earth foundations. An area of storage-pit concentration, probably used as granary, was located in the southeast of the enclosure (Shanxi Team *et al.* 2003a) (Figure 4.19).

A large cemetery (3 ha in size), dating to the entire Taosi period, was found in the southern sector of the site. It contained a few thousand burials, which clearly manifested social stratification. The large tombs were associated with hundreds of items including elaborated pottery, jade, and wooden artifacts, and exotic ritual goods for ceremonial purposes, while the small tombs had no grave goods at all. It is notable that the most elaborate burials are dated to the early phase (Gao Wei *et al.* 1983; Shanxi Team 1983). Commoners' residences were distributed in many locales over the site, but were more concentrated in the northwestern part (Figure 4.19). These areas have only been briefly excavated, yielding a few houses, mostly cave and semi-subterranean dwellings (Shanxi Team 1986; Shanxi Team and Shanxi Linfen 2003).

During the middle phase, a large enclosure was built. Although largely destroyed by floods and soil erosion, the remaining walls of this new enclosure measure 8 to 9 m in width and 280 ha in area. The granary, measuring about 1000 m^2, was still in use. A small enclosure (10 ha) was also constructed in the southeastern part of the site, within which there was a small elite cemetery. One of the burials has been excavated; the grave goods include more than one hundred elaborate pottery, wooden, stone, and jade objects, and some sacrificial pigs; a dismembered human skeleton was found in the fill (He Nu and Yan 2002; Shanxi Team *et al.* 2003a, b) (Figure 4.19).

The Taosi rammed-earth enclosure is the largest one dated to the Neolithic period, and its construction must have required an enormous labor force drawn from many settlements in the basin. A temporary hearth, associated with animal bones, broken pottery jars, and charcoal has been found inside the southern section of the rammed-earth walls, suggesting that workers may have built temporary shelters and cooked their own meals while constructing the walls. These people were probably not the Taosi residents but came to work as tribute labor from other settlements in the region (He Nu 2002).

Taosi seems to have experienced some political turmoil during the late phase. The large rammed-earth enclosure was destroyed; the palatial area of the early phase now became a craft production area, making stone and bone artifacts, particularly bone arrowheads; more than forty human skeletons, some of which were dismembered or embedded with a weapon, were found buried in a ditch within the previous palatial area; finally, the elite burials in the small enclosure were also broken into and disturbed, and five human skulls and some grave goods were left in the intruded pits (Shanxi Team *et al.* 2003a, b).

It is notable that when the Taosi enclosure was being destroyed during the late phase, a very large site emerged at Fengcheng-Nanshi (230 ha) in the south of the Taer Mountains. This development formed competition in the basin, and the evidence of violence observed at Taosi during its late phase conforms to the situation of military conflict (more discussion in chapter 6).

A copper bell, made by casting techniques, was found at the site (Shanxi Team 1984), marking Taosi as one of the earliest Neolithic sites associated with metallurgy in the middle Yellow River valley. This bell may have been made with local ores that were available in the mountain regions. It is notable that this item was unearthed from a small tomb without other grave goods, while all large burials have yielded no metal objects at Taosi. This suggests that the early use of metal at this site was not integrated with the existing prestige-goods system for expressing social hierarchy, a phenomenon also seen at some other late Neolithic sites. Not until the Erlitou period did bronze objects become the most valuable ritual goods and status markers associated with high elite groups (Liu, L. 2003a), and was copper ore in the Linfen region sought by the elite of early states (Liu, L. and Chen 2001b).

Several kilns have been unearthed at the site (Shanxi Institute 1999; Shanxi Team 1986), suggesting that ceramics were made locally. In addition, Taosi was a stone-tool manufacturing center. A large number of tool blanks and manufacturing tools (e.g., hammer stones) have been unearthed at the site, especially in concentration in the southwestern part of the site (He Nu 2003, personal communication). A quarry has also been found at Mount Dagudui, 6 km south of Taosi (Figure 4.19). This quarry was used during the Paleolithic and Neolithic times, and the lithic debitage, waste, flakes, and tool blanks are accumulated up to 4 m thick and distributed in an area of 15 ha. The raw material is grayish-black metamorphic rock, obtained directly from the bedrock underneath. The tool types identified at the Dagudui quarry clearly resemble their counterparts found at Taosi, including spade, axe, wedge, chisel, chime stone, large knife, and spearhead (Hu 1997; Tao 1991; Wang Xiangqian *et al.* 1987). Among these items the chime stone and the large knife were ritual objects which only occurred in the most elaborate burials at Taosi (Figure 4.20).

Taosi evidently was the economic and political center of the region, engaging in several types of craft production and witnessing the emergence of elite groups. Similar to many other regional centers, craft production may have played an important role in the development of this settlement as a central place.

Summary

The late Neolithic settlements revealed above were most probably central places in their immediate regions. They are evidently different in form and size, suggesting

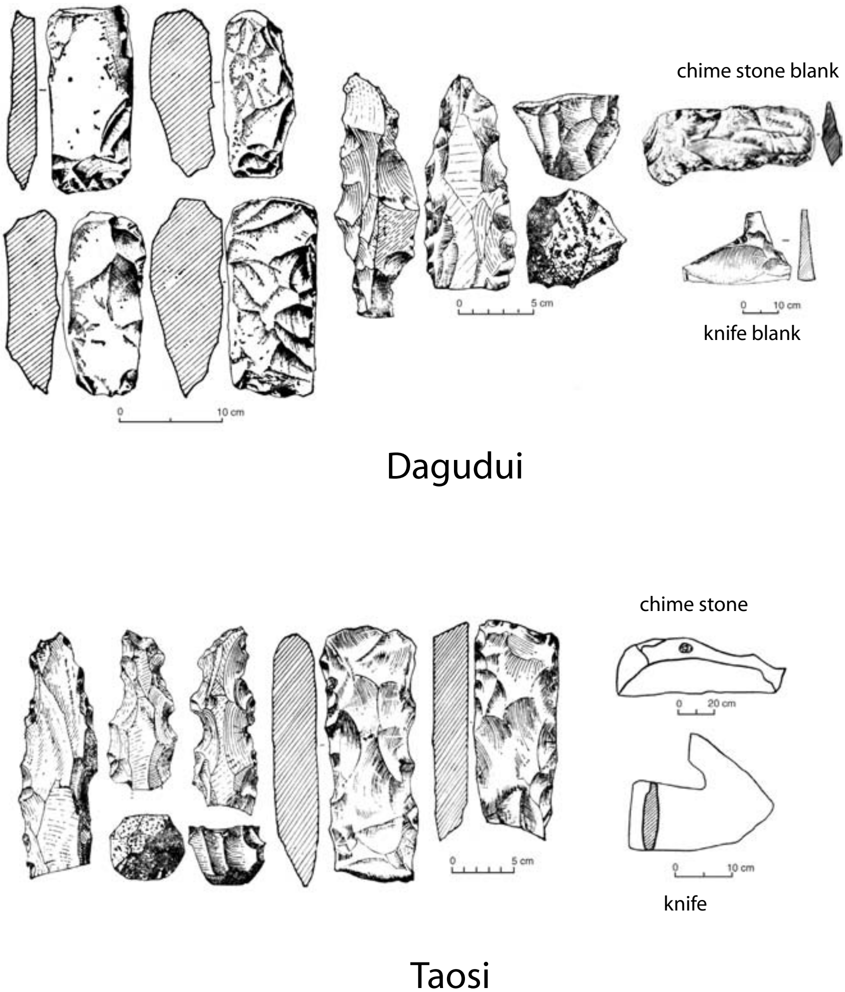


Figure 4.20 A comparison of similar tool blanks and artifacts from the Dagudui quarry and the Taosi site (adapted from Tao 1991: figs. 2, 3, 4, 7; Shanxi Team 1980b: fig. 8; Hu 1997: fig. 5).

great regional variability. These settlements also manifest several characteristics newly developed in the Yellow River valley. First, building town walls became more prevalent. These fortified sites were often associated with features not seen in small villages, including guardhouses, drainage systems, and a palatial compound. The construction of rammed-earth walls and these facilities required leadership to mobilize labor in communal activities at a regional level. Second, residential segregation may have developed in many communities, but is more explicit in walled and very large settlements. This trend is indicated by well-constructed buildings, some large in size and complex in structure and some associated with human sacrifice, found separated from commoners' residences inside walled enclosures (Guchengzhai and Taosi). Third, regional central places were usually specialized in craft production, including pottery, stone tools, textiles, and possibly metallurgy. Many of these sites were situated in proximity to natural resources and near river channels, which provided water, lithic raw material, and a means for transportation by boat; such locations facilitated craft production and distribution.

Discussion and conclusions

Several changes in settlement organization during the Neolithic period indicate the development of social organization from relatively egalitarian to stratified.

Building form, settlement layout, and residential segregation

Structurally, small houses changed from single, round, semi-subterranean designs to single or multi-roomed, square-shaped, ground level, and compound-like types. The last variant was the result of adding new rooms to an existing house, suggesting a strategy which people adopted to meet the needs of an expanding family. The palatial compound at Guchengzhai anticipated the form of elite architectures in early states, exemplified by palatial foundations at Erlitou in Yanshi, Henan, which had compounds surrounded by roofed corridors (Institute of Archaeology 1999b).

In the middle and late Yangshao periods regional distribution of settlements became hierarchical, and the centers reached 90–100 ha in size (e.g., Beiyangping and Dadiwan). This was the beginning of a new era in which diverse settlement layouts appeared at the community level, probably reflecting different leadership strategies adopted by the elite in response to difference social and environmental challenges. In the Wei River valley public buildings became bigger in size, and their functions changed from communal activities at the community level (e.g., Banpo and Jiangzhai) to public affairs, such as ritual ceremonies and/or redistribution of goods, at both local and regional levels (e.g., Xipo, Dadiwan, and Anban). This change manifests group-oriented political strategies that emphasized intra- and inter-community cooperation, as well as a trend leading to increased political integration on a regional scale. On the other hand, a fortified site (Xishan) first developed on the floodplains of the middle Yellow River valley, suggesting leadership strategies focused on interpolity competition. In time the latter settlement type became a major characteristic of the Longshan culture.

There is no evidence for residential segregation in the early Neolithic period when public buildings were used for communal activities. Residential segregation only became clearly evident in some walled settlements in the late Longshan period, such as Taosi and Guchengzhai, where the large palatial buildings were elite residences. This development coincides with the emergence of elite groups who were able to motivate large numbers of people for constructing rammed-earth fortifications.

Throughout the early and during most of the middle Neolithic periods, the settlement form was characterized by multiple, centripetally organized residential sectors, probably representing a segmentary or relatively egalitarian social organization. This settlement layout disappeared in late Yangshao, and linearly organized compound-like house clusters developed in the late Dawenkou and the late Longshan. This shift may have been a physical adjustment to the growth of population within family units as well as to transformations in social and economic organization. Economic production was most probably organized on a household–community basis during the early Yangshao period (e.g., Jiangzhai), but changed to a household basis, which probably comprised an extended family (e.g., Yuchisi and Kangjia). This change may have encouraged the expansion of the family size to provide a large labor force; this situation, in turn, required a corresponding expansion in domestic space, thus resulting in the emergence of compound-like house clusters. The changing focus of the productive unit, from community-household to household seems to parallel the emergence of competitive emulations, such as feasting sponsored by households, and the development of social inequalities among households in a community.

Control of resources, craft specialization, and social inequality

Craft specialization appears to have already developed in the early Neolithic, such as stone tool manufacture at several Peiligang and Yangshao sites, because settlements had different degrees of access to various resources. It is important to note that craft production and control of access to scarce resources became particularly associated with central places, which form the highest tier of the settlement hierarchy. Xipo is one of the first such examples. In the case of Yuchisi, the households associated with craft production (pottery) appear to have hosted the most frequent feasts, perhaps indicating competitive emulation among several kin-groups in the community. Thus, it is possible that the households with craft specialization had better opportunities to gain wealth and prestige in a community, because they were more likely to establish external ties with other local or regional communities for access to both utilitarian goods and valuables. These settlements developed into regional centers because they were the locales of craft production, and individuals who engaged in such production could directly contribute to the circulation of goods and services within a large integrated economic and social network, and thus obtain prestige and power. This situation supports Costin's proposition, as cited in the beginning of the chapter, that there is a direct link between craft specialization and the acquisition of social status (Costin 1998).

After analyzing ceramic vessels from several Neolithic sites, Underhill concluded that there is no compelling evidence for change in the organization of labor required to produce pottery, which may indicate elite involvement in production, during the late Neolithic period. Underhill has proposed that a key component of emerging elite identity was the strategy of producing surplus, but not of controlling craft production, to support feasting for negotiation of social and political relations, and for acquisition of labor-intensive goods. Some descent groups achieved socio-political power by controlling land, food sources and labor (Underhill 2002: 196–199). My findings from the Yuchisi site seem to concur with Underhill's suggestion that ceramic manufacture was carried out as household production. However, the coincidence of pottery production and frequent feasting in the same households at Yuchisi suggests that craft production was probably an important means for negotiation of power and prestige. A similar situation can also been seen at Xipo, where production of ritual goods and feasting went hand in hand. Craft products could be used to exchange food, labor, and other resources, and there is no reason to assume that only the control of land would bring a surplus of food for hosting feasts.

However, since most excavations in China have been focused on relatively large settlements which were likely to be central places on a local or regional scale, we do not have enough data to investigate craft production at small sites. It still remains to be seen if small villages were also involved with various types of craft production.

Monumental construction and social organization

Communal construction of monumental structures, such as ditches surrounding settlements, was an activity on a scale transcending the basic household group; perhaps the construction was mainly for protecting the community from wild animals and to create transportation channels. This type of activity began in the early Neolithic period (e.g., ditches at Jiahu), and became prevalent later. A new type of monumental structure, rammed-earth walls, developed during the late Yangshao period and reached an unprecedented level, both in size and in number, during the late Longshan period. This phenomenon manifested an important socio-political transformation. Constructing rammed-earth walls is much more labor intensive, and the collective labor forces may have come from many communities in the region (e.g., Taosi). Elite groups had the ability to mobilize the population, perhaps as tribute labor, from surrounding areas, suggesting the existence of a chiefdom-level social organization, which by definition was a polity that centrally organized a regional population (Carneiro 1981; Earle 1987; 1991b: 1).

Most walled sites were occupied as villages before and after the construction and use of the walls. The appearance of the walls, therefore, was an episode in local settlement development. The function of the walls has been commonly understood as a means of meeting the demands of intensified inter-group warfare. Several lines of evidence can certainly support this proposition, such as increasing numbers of arrowheads, abundant evidence of human sacrifice, and human skeletons with traces of violence, all found in many Longshan sites over a broad region. However, there may have been other functions associated with those fortifications. Given the fact that floods destroyed the walls of several fortified sites (e.g., Wangchenggang and Guchengzhai), it is possible that the walls were constructed to protect these economic and political centers from floods as well as human rivals. In addition, such large public constructions may also have been used as political symbols, to demonstrate the power and prestige of the elite who was able to mobilize large numbers of people regionwide to conduct these great projects (e.g., Taosi). In any event, these functions could certainly create and maintain prestige and power for elite groups.

Walled settlements, referred to as towns in Chinese archaeological literature, are commonly regarded as a proto-type of cities in China. These sites were often the largest settlements in their regions and functioned as central places (see chapter 6). These centers usually performed economic functions, and specialized in certain types of craft production. This situation suggests that the formation of proto-types of urban centers was related to the economic roles of these settlements.

Through the Neolithic period population grew significantly, indicated by the increasing size and number of settlements. The development of settlements from villages to towns was also related to population nucleation, as implied in the quotation by Sima Qian cited at the beginning of this chapter. It is notable that these regional centers show great variability in size, form, and level of social complexity. Some appear to be characterized by competitive emulation among several kin groups (e.g., Yuchisi and Kangjia), others express more centralized leadership (e.g., Guchengzhai and Taosi). In terms of social organization, these communities probably range from transegalitarian/rank societies to chiefdoms. It is notable that many regional centers manifest some common characteristics of early urban sites in ancient China, and apparently functioned as political, military, ritual, economic, and population centers at a regional level. This is an important point relating to the nature of the earliest urbanism and state formation in China, a topic I shall return to in chapter 8.

5

Community burial patterns

> Hence the successor of Shao-hao, Chuan-hsu, charged Ch'ung, Governor of the South, to handle the affairs of Heaven in order to determine the proper place of the spirits, and Li, Governor of Fire, to handle the affairs of Earth in order to determine the proper places of men. And such is what is meant by cutting the communication between Heaven and Earth.
>
> "Severance of heaven–earth communication" in *Guoyu*, a fourth-century BC text[6]

Introduction

Approaches to mortuary remains have been debated by Western archaeologists, and their research foci have shifted from processual archaeology's reconstruction of social organization to post-processual archaeology's understanding of ritual practice (Pearson 1999). I view these two approaches as mutually complementary methods for the analysis of mortuary data. On the one hand, processual archaeological approaches regard the quantity and quality of grave furnishings as direct or indirect manifestation of social patterns, especially of social rankings (e.g., Binford 1971; Peebles 1971; Saxe 1970; Tainter 1973). On the other hand, post-processual approaches argue for contextual archaeology, which hypothesizes that the participation of survivors in funeral rites may have contributed to patterns in mortuary practice (e.g., Hodder 1982a, 1982b). A careful analysis of depositional processes in archaeological records, with attention to the ritual activities involved, can provide great insight into both the symbolic meanings of burial patterns and the relationships between the living and the dead in the ritual context (Barrett 1988: 30–41; Thomas 1991). Scholarly understanding of the symbolic element in such ritual practice should be grounded in historical and ethnographic studies. By considering both aspects of mortuary practice, i.e. the social status of the dead and ritual practice of the living (cf. Morris 1991), we will gain a better understanding of Neolithic societies.

Neolithic burials are a major focus in Chinese archaeology, but research approaches in China have been rather different from those in the West. Over the past forty years, the influence of the Morgan-Engels social evolutionary perspective led many Chinese archaeologists to reconstruct a general model of social progression. Consequently, evidence from Neolithic burials was interpreted to fit a pattern of parallel development, between the shift from matrilineal or matriarchal to patrilineal or patriarchal social organizations, and the evolution from egalitarian to class-based societies (Pearson 1988).

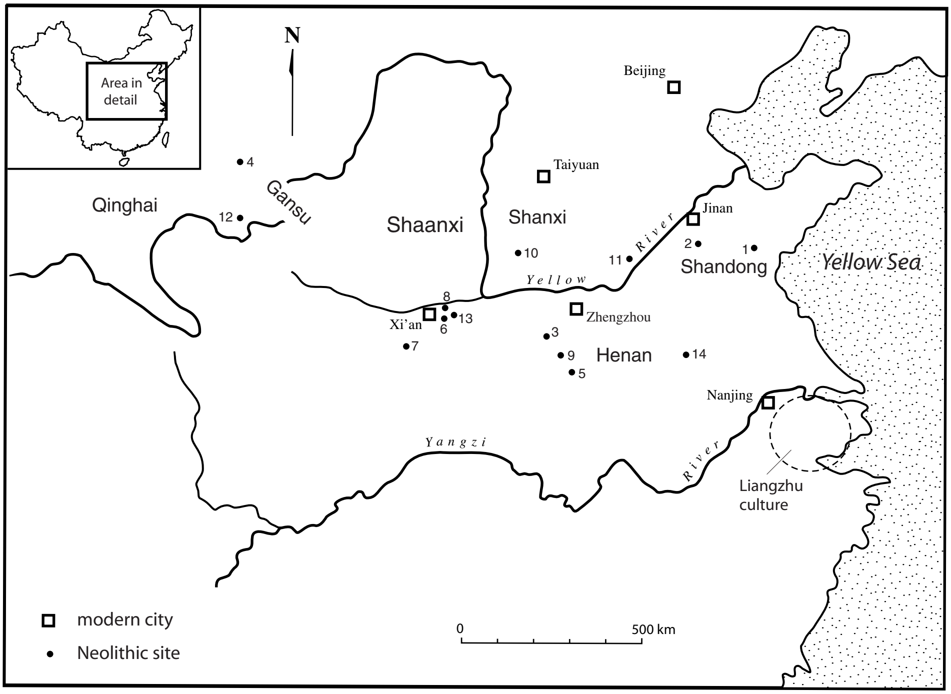


Figure 5.1 Location of major Neolithic sites discussed in chapter 5: 1: Chengzi; 2: Dawenkou; 3: Hongshanmiao; 4: Huangniangniangtai; 5: Jiahu; 6: Jiangzhai; 7: Longgangsi; 8: Shijia; 9: Shuiquan; 10: Taosi; 11: Xishuipo; 12: Yangshan; 13: Yuanjunmiao; 14: Yuchisi.

Recently, scholars in the West have also become interested in mortuary data from Neolithic China. Special attention has been paid to the social hierarchy and organization manifested in burial patterns (e.g., Allard 2001; Liu, L. 1996a; Pearson 1981, 1988; Underhill 2000), and to the symbolic and ritual elements manifested in mortuary contexts (e.g., Fung 2000; Keightley 1985, 1991; Lee and Zhu 2002; Liu, L. 2000a; Underhill 2002). These new studies established a basis for further research on the subject.

This chapter presents a comprehensive analysis of burials to determine relations between social hierarchy, ritual activities, and exchange of elite goods. The following discussion pays special attention to the ways in which mortuary patterns were transformed, and how associated social, ritual, and economic factors were related to social change during the Neolithic, with emphasis on the Longshan period. The study area includes the entire Yellow River valley, and Figure 5.1 illustrates the locations of major sites discussed in this chapter.

Alternative approaches to Neolithic burial patterns

Of major methodological concern in this study is the spatial organization of Neolithic cemeteries. As Goldstein (1981) has pointed out, mortuary sites "reflect both a differentiation of activities and a differentiation of the social units performing the activities; mortuary sites should thus also exhibit a complex formal–spatial structure." Many ethnographic and archaeological studies conducted in different regions of the world conclude that spatial variation in mortuary remains is closely related to kinship organization (Goldstein 1976; Saxe 1970: 223–234; Tainter 1976), and the occurrence of formal, bounded burial areas is always associated with the existence of different corporate groups practicing lineal descent (Goldstein 1976).

Another recent development in mortuary studies investigates burial variability at a regional level, rather than focusing on individual sites (Beck 1995). Comparative analyses of regional variations between settlement patterns and burial patterns is especially useful in the present study.

In order to understand major changes in burial patterns, I focus on two closely related social processes during the Neolithic period in China. The first is the change in ritual practice centered on ancestral cults, and the second is the development of social stratification in kin-based society. In discussing burial patterns and kinship relations, I use the term "kin group" to refer to social groups that were organized on the basis of kin, such as family, extended family, and lineage.

Ancestral cults

Ancestor veneration is a process of ritual activity which can be reconstructed by analyzing archaeological material remains that demonstrate a non-random pattern of use and discard, which provides insights into the nature of the ritual itself (e.g., Marcus and Flannery 1994; McAnany 1994). Ancestral cults have long been recognized as the dominant religious form in ancient China. In the Shang dynasty communication between the king and his ancestors was a source of political power (Chang 1983a: 44–55). The king depended upon his ancestors for blessings which in turn affected the common people, while the ancestors depended for their strength upon the sacrificial offerings which were provided by the living kings (Keightley 1978: 212–214). Making sacrifices to ancestors at gravesites was a common practice during the Shang dynasty. Pits containing sacrificial offerings (including humans, animals, chariots, and bronze vessels) were found near the royal tombs in Anyang, and sacrifices were made both during and after burial (Chang 1980: 110–124). In addition, sacrificial pits filled with dark ash, charcoal fragments, and burnt animal bones were found surrounding the foundations of edifices which may have been used as palaces or ancestral temples of the Shang royal family (Chang 1980: 90–95). Not all the deceased were ancestors who would be remembered and worshipped by descendants, in a stratified society. It is obvious that sacrificial remains are mostly concentrated in the Shang royal cemetery in Anyang.

The form and nature of ancestral cults similar to those observed in the Shang burials can be traced back to pre-dynastic times. In many Neolithic burials, the arrangement of grave goods was the result of funerary processes and ceremonies conducted by the living (Fung 2000; Keightley 1985). Pits containing artifacts and animal remains near burials may have been sacrificial features related to ancestral rituals (Liu, L. 1996a, 2000a). Mortuary activities relating to ancestral cults, observed in these burial sites, show marked differences in time and space, and changes seem to correlate closely with the developmental phases of social complexity, especially with the emergence of social hierarchy and increased emphasis on the social status of the individual (Liu, L. 2000a).

Social stratification

Reconstruction of social organization based on burial data is a challenge, and material remains in mortuary contexts can be misleading if they are treated as direct indictors of the deceased's social ranking. However, the results of recent studies on Chinese Neolithic and Bronze Age burials have demonstrated the close correlation between the increased elaboration and greater variability of mortuary remains, and the development of complexity in social structure (e.g., Shelach 2001; Underhill 2000). Therefore, it is possible to measure the level of social stratification based on quantitative analyses of burial data.

The variables in Neolithic burials that can be correlated with social stratification are derived from three main categories of material remains: (1) the size and structure of the graves, (2) the quantity and quality of grave goods; and (3) the presence of prestige goods, such as high-quality ceramics, jades, musical instruments, and pig skulls, or mandibles. The significance of these variables is discussed below.

There is a basic correlation between the size of a tomb and the quantity and quality of grave goods in the tomb, at many Neolithic burial sites. As an indicator of labor investment, burial size is an important variable for the analysis of social status. A large-size burial constructed with an *ercengtai* ledge, in particular, represents high social status in mortuary practice. The *ercengtai* ledge is a narrow, step-like formation in the earthen sides of a tomb, usually at the height of the wooden burial chamber's or coffin's corner, and surrounding it. It may have served as a surface for displaying burial goods (Keightley 1985: 33) (Figure 5.2).

Grave goods are other indicators of energy investment in mortuary contexts. Pottery vessels for cooking, serving and storage are the most common grave goods from the Neolithic period, and many may have been used as real or symbolic receptacles for food and drink in the mortuary ritual feasts conducted by survivors (Fung 2000; Keightley 1985: 33; Underhill 2000, 2002). The quantity and quality of vessels might correlate to the social status of the diseased, in that the higher the social position, the greater the number of mourners who would have attended the funeral ritual, and the larger the quantity of vessels included in the burial. High-quality ceramics may have been used as status markers of the deceased. Egg-shell pottery goblets (Figure 5.3), for example, were such valuable items, particularly produced for ritual purposes and exchanged among elites of the Longshan culture in the east coast regions (Du 1982; Liu, L. 1996a).

In the Yellow River region jades began to appear in some Dawenkou burials on the east coast, followed by the Longshan culture in Shandong (Shao 1995), southern Shanxi (Shanxi Team 1980b), and northern Shaanxi (Dai 1988; Ji Naijun 1984; Sun Zhouyong 2002), and by the Qijia culture in Gansu (Ye 1997). Jade artifacts are elite goods because of the rarity of the raw material, and the need for specialized skills and intensive energy input during the production process. In several Neolithic cultures in China, elite individuals were directly involved in the production of jade

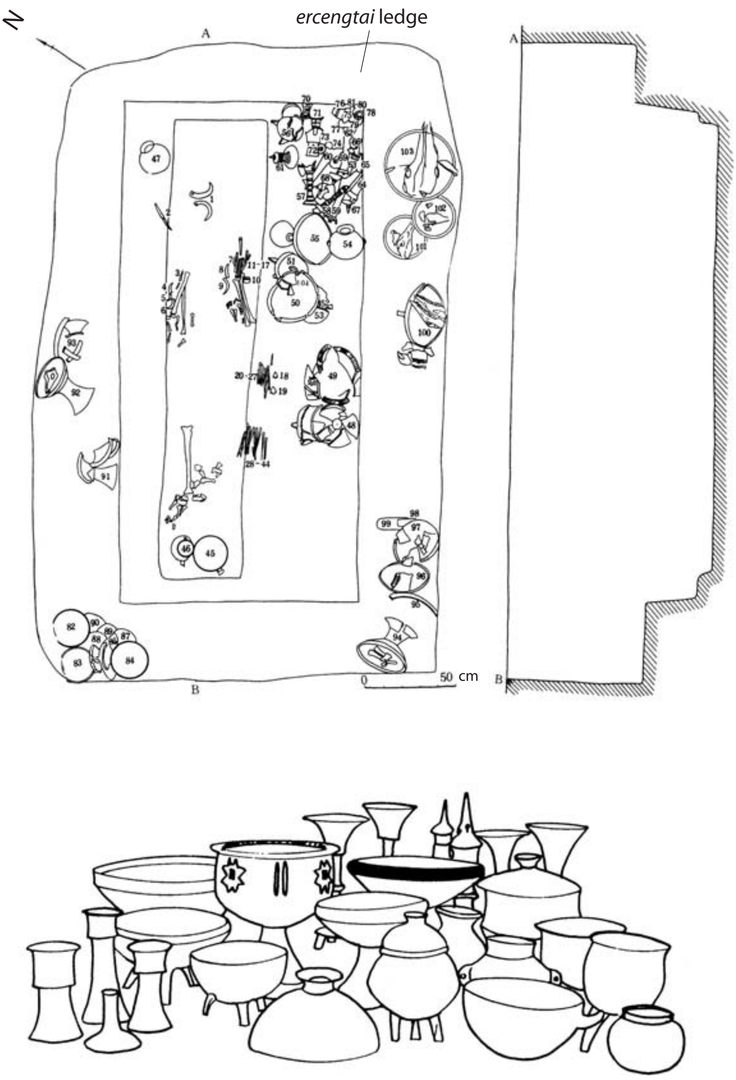


Figure 5.2 Example of an elaborate tomb constructed with an *ercengtai* ledge, containing a large number of ceramics at the Dawenkou site (M2005), early Dawenkou period (adapted from Shandong Institute 1997a: figs. 80, 81).

ritual objects (Liu, L. 2003a). Different styles of jade objects may have originally derived from various regional cultures, and some were later adopted by other cultures during the late Neolithic and Bronze Age (Yun and Mou 1992). Three of the trans-regionally recurring jade forms are *cong* tube, *bi* disk (Huang, T. 1992) and *yazhang* tablet (Deng 1994) (Figure 5.4). The *cong* tube and *bi* disk may have symbolized cosmological features – heaven and earth (Chang 1989). These objects were probably used as ritual paraphernalia in religious ceremonies by elites who controlled cosmological knowledge and ritual power, and the inter-regional distribution of similar forms of jades represents the interaction of elites who controlled ritual power (Liu, L. 2003a).

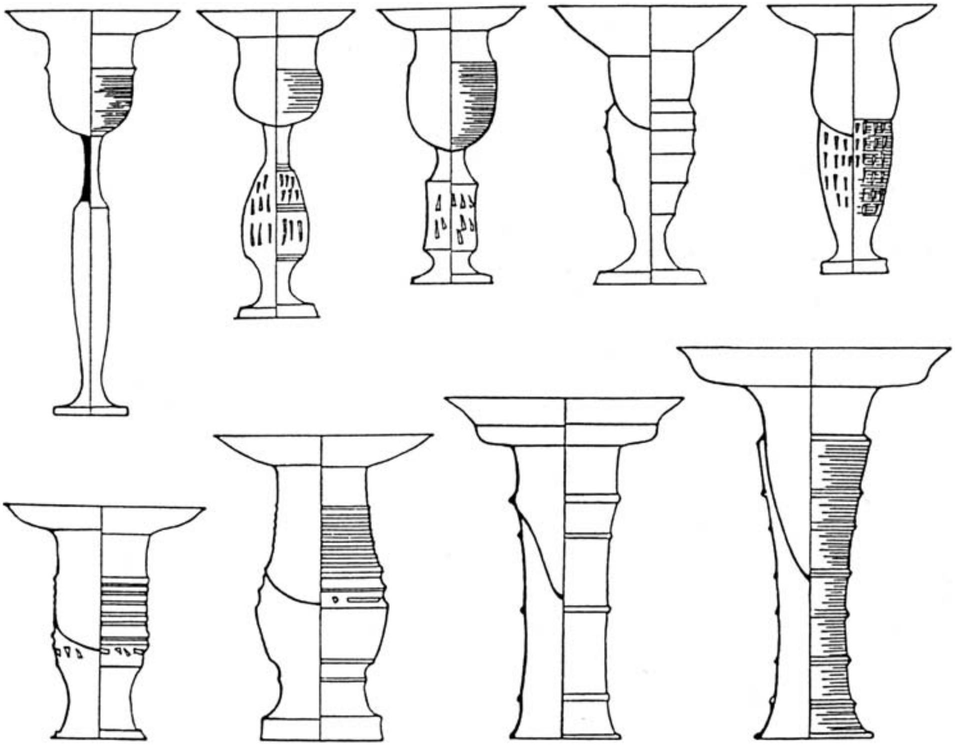


Figure 5.3 Examples of egg-shell pottery goblets found in Shandong (adapted from Du 1982: fig.1).

Several types of musical or ritual instrument appear to have been associated with high social status, including bone flutes, turtle rattles, and drums. These items usually occur in relatively elaborate burials in a cemetery. Bone flutes have only been unearthed at Jiahu in Henan, dating to the Peiligang culture (see below). Turtle rattles, which may have also been used as divination instruments, have been found over a rather extensive area, and dated to a long period of time, as discussed in chapter 3 (Figure 5.5).

Two types of drum have survived in the archaeological record: alligator drums and pottery drums. Alligator drums, comprising a wooden frame covered with alligator skin, have only been found in the most elaborately furnished Neolithic tombs. In Neolithic times alligators probably lived along the east coast region, including southern Shandong (Zhou Benxiong 1982: 251–52, 257), and no alligator remains in their natural form have ever been found in the Central Plains. The earliest example of alligator drums was discovered in a large burial at Dawenkou in Shandong, and several Longshan sites in Shandong also yielded such drums (Shao 1989). In addition, alligator drums were found in large burials at Taosi in Shanxi, nearly 500 km from the alligator's native habitat in Shandong, suggesting the existence of a long-distance exchange of ritual goods among high-level elites (Liu, L. 1996a).

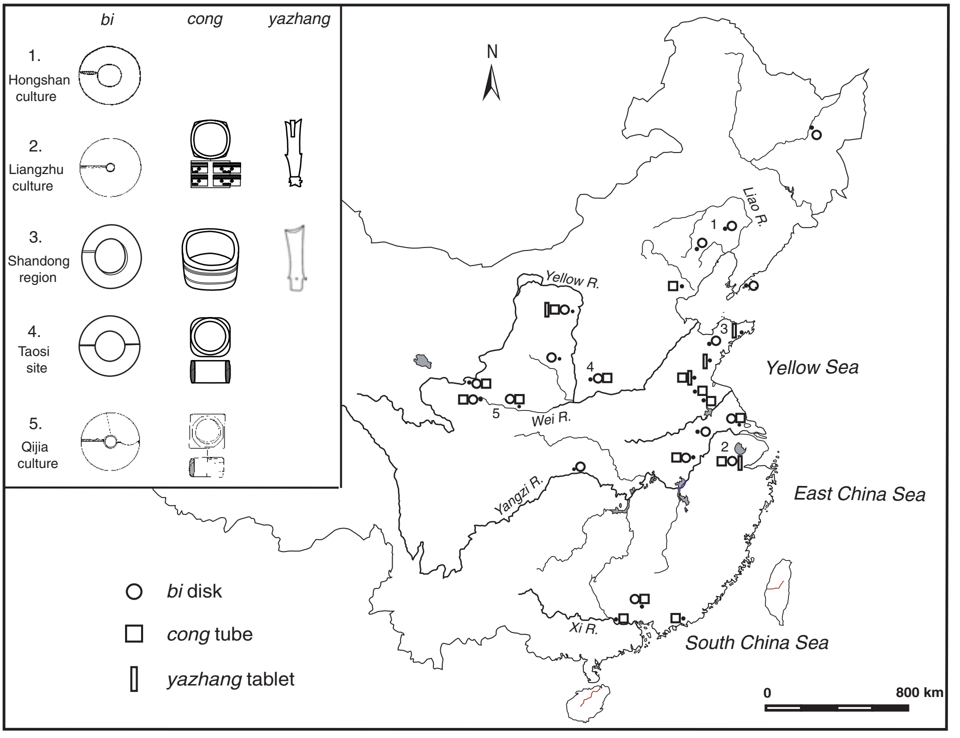


Figure 5.4 Distribution of three recurrent jade forms: *cong* tube, *bi* disk, and *yazhang* tablet, dating to the Neolithic period (adapted from Deng 1994: fig. 3; Huang, T. 1992: figs. 9, 10).

Pottery drums (Figure 5.5) have been found over a very broad area, from Shandong in the east to Qinghai in the west, dating to a period of ca. 5500–2350 BC. Despite a diversity of forms, the common trait of most of these drums is that they were found in the most elaborately furnished tombs in cemeteries (Gao Tianlin 1991). Based on the testimony of ancient texts, drums manifested shamanistic characteristics and were often used as major instruments in ritual ceremonies, and the invention of drums was even attributed to the *wu*, or shamanic practitioners (Tong 2002). Many ethnic groups in southern China, until the present day, have used various types of drums, which often played an important role in ritual ceremonies and warfare (Chen Ju 1984; Tong 1990; Wang Ningsheng 1989a, c). This historical and ethnographic information suggests that the inclusion of drums in the grave goods of rich Neolithic burials demonstrates the high social status of the deceased, and implies that these people are likely to have been ritual practitioners.

The interment of domesticated pig skulls, mandibles or even whole pigs in burials can be traced back to the early Neolithic period in the sixth millennium BC at the Dadiwan site in Qin'an, Gansu (Gansu Museum 1981). This practice became widespread during the Neolithic period, and continued during the Bronze Age in China (Wang Renxiang 1981). Most examples of pig skulls and mandibles are normally, but not exclusively, associated with rich burials in the late Neolithic period.

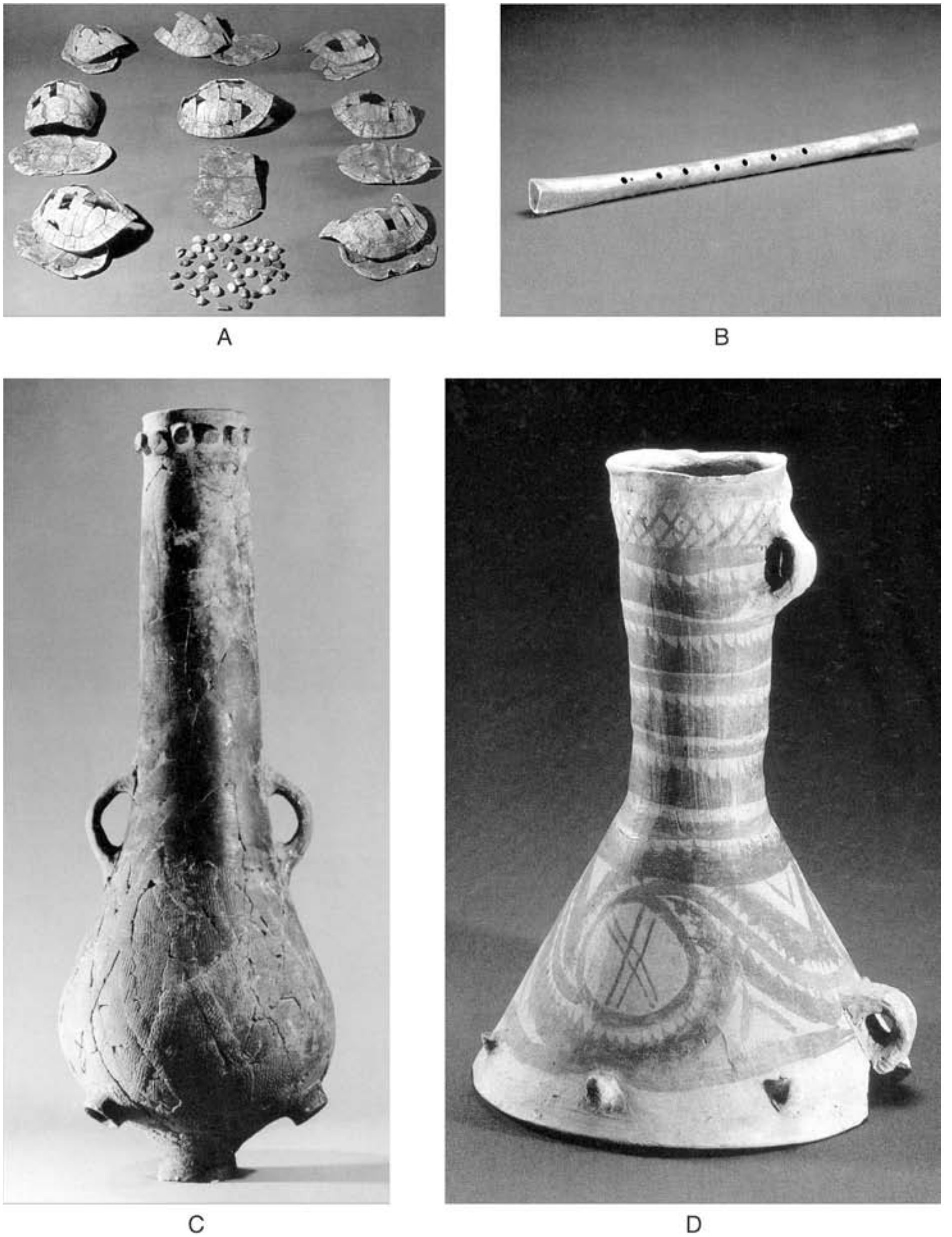


Figure 5.5 Examples of musical instruments or ritual paraphernalia from Neolithic sites: (A) turtle shells (rattles) from Jiahu in Henan, Peiligang culture (Henan Institute 1999: Plate 41–1); (B) bone flute, 22.2 cm in length, from Jiahu in Henan, Peiligang culture; (C) pottery drum from Taosi in Shanxi, Longshan culture, 83.6 cm in height (Zhongguo 1990: Plates 9, 24); (D) pottery drum from Lanzhou in Gansu, Majiayao culture, 30 cm in height (Institute of Archaeology 1993: Plate 37) (with permission from Henan Institute of Cultural Relics and Wenwu Press).

Chinese and Western archaeologists have developed a number of interpretations concerning the inclusion of pig bones in burials. Some argue that pig skulls and mandibles were displays of wealth, marking the origin of private ownership in prehistory (for a review see Wang Renxiang 1981). Some suggest that the control of pigs by the elite may be one of the key variables in the development of political power and prestige-oriented long-distance exchange (Kim 1994: 126). Others emphasize the ritual function and symbolic meanings of pig bones included in human burials, arguing that pit sacrifice was an ancient tradition in funerary rituals, based on textual and ethnographic data (Wang Renxiang 1981), and that pig skulls found in Neolithic burials were probably provided as part of mortuary rituals by groups allied to the immediate kin of the deceased (Fung 2000; Keightley 1985: 33–34).

If pig heads were provided mainly by kin groups related to the deceased as sacrificial offerings in mortuary ritual, and given the likelihood that the pig was also an indicator of wealth, then the quantity of pig skulls may have been related to the status of the deceased in the following way: the higher the social position held by the deceased in his lifetime, the greater the number of people who would have attended the funeral, and the greater the quantity of pig skulls that would have been presented at sacrificial offerings (Wang Renxiang 1981: 84). Continuing this line of reasoning, the interment of pig skulls may be interpreted as evidence of the degree of honor or status awarded to the deceased by survivors.

In summary, grave goods are socially meaningful, since they manifest the control and manipulation of material and human resources in various ways. My following analysis examines relationships between several variables, including grave structures, number of grave goods, gender, and age. Since many archaeological reports in China do not provide enough data for systematic analyses, it is impossible to apply the same set of variables to every case study. Therefore, in some cases there are missing variables in the analyses. Two attributes are used in statistic analysis to examine burial stratification at the intra-cemetery level. The first is the variability of grave size and number of grave goods in each site, indicated by *coefficient of variation* (CV), which is the standard deviation divided by the mean. The second is the correlation between grave size and number of grave goods, measured by *coefficient of determination* (R^2), the squared value of *correlation coefficient* (R). Since the relatively larger values of CV and R^2 suggest greater variability of the variables (Shennan 1997), these attributes, together with other factors involved in mortuary contexts, can be used as indicators of burial differentiation (cf. Shelach 2001). The comparison of results from all case studies thus provide us with a better understanding of changing patterns in time and space.

I pay special attention to the changes in intra-cemetery spatial patterns through time. This refers to the location of graves within a site, the distribution of differently ranked graves, the spatial relationships between graves and associated features (e.g., sacrificial pits), the diachronic changes observed in a site that is divisible into multiple phases, and the depositional practices relating to ritual activities.

Regional variability in burial patterns

In the following section, I will investigate the variability of burial patterns from ten sites dated from the early to late Neolithic periods in three regions: the Central Plains, the lower Yellow River region, and the upper Yellow River valley. By comparing different mortuary practices at the community level in these regions through time, we have a better understanding of social change, from egalitarian to complex societies, across a broad spatial dimension.

The Central Plains

The Central Plains are the region where archaeologists have discovered the longest sequence of Neolithic cultures in the Yellow River valley, dating from 7000 BC to 2000 BC, and where many burial sites have been excavated.

Early Neolithic period Several sites dating to the Peiligang culture (ca. 7000–5000 BC) have well-organized cemeteries. These include Jiahu and Shuiquan.

Jiahu: At Jiahu in Wuyang, Henan (Figure 5.1), the settlement was divided into several sections, perhaps occupied by related kin groups (see chapter 4). Each group had a spatially defined cemetery associated with its residential area. A total of 349 burials has been excavated. These burials varied in size and form, and included the following types: single primary burial, single secondary burial, multiple primary burial, multiple secondary burial, and collective burial of multiple, single and secondary interments. Most burials had grave goods varying between one and a few dozen, with implements, personal ornaments, and pottery vessels predominating.

In order to understand the burial variability in grave size and quantity of grave goods, I analyzed 97 primary and secondary single-interment burials among the 167 burials dated to Phase II (ca. 6600–6200 BC) (Figure 5.6). The sizes of burials range from 0.14 to 3.32 m^2, with the CV of 0.52. The differences are mainly due to the types of tombs, since primary burials tend to be large and secondary ones tend to be small. The numbers of grave goods vary between 0 and 33, with the CV of 0.12, suggesting the differentiation among burials is limited. The correlation between these two variables analyzed is weak ($R^2 = 0.15$). Six juvenile burials had regular grave sizes, but a small quantity of grave goods. In general, female burials seem to have fewer grave goods (the mean is 3.42 for female and 6.34 for male), but they are slightly larger in size (the mean is 1.29 for female and 1.26 for male) than male burials (Figure 5.7A; Appendix 7.1). These results point to a low level of burial variability.

Some special items, which may have been ritual paraphernalia, were found in twenty-five tombs at Jiahu. These included bone flutes (which are the earliest such musical instrument in the world), turtle shells (identified as *Cuora flavonmarginata*), some bearing inscriptions and often containing small pebbles and probably used as rattles (Figure 5.5A, B), and double-point-shaped objects made of bone with unknown functions (Henan Institute 1999). Among the 97 Phase II burials analyzed above, 13 are associated with such ritual objects. These tombs with ritual objects were generally, but not exclusively, large in size and rich in grave goods (Figure 5.7B;

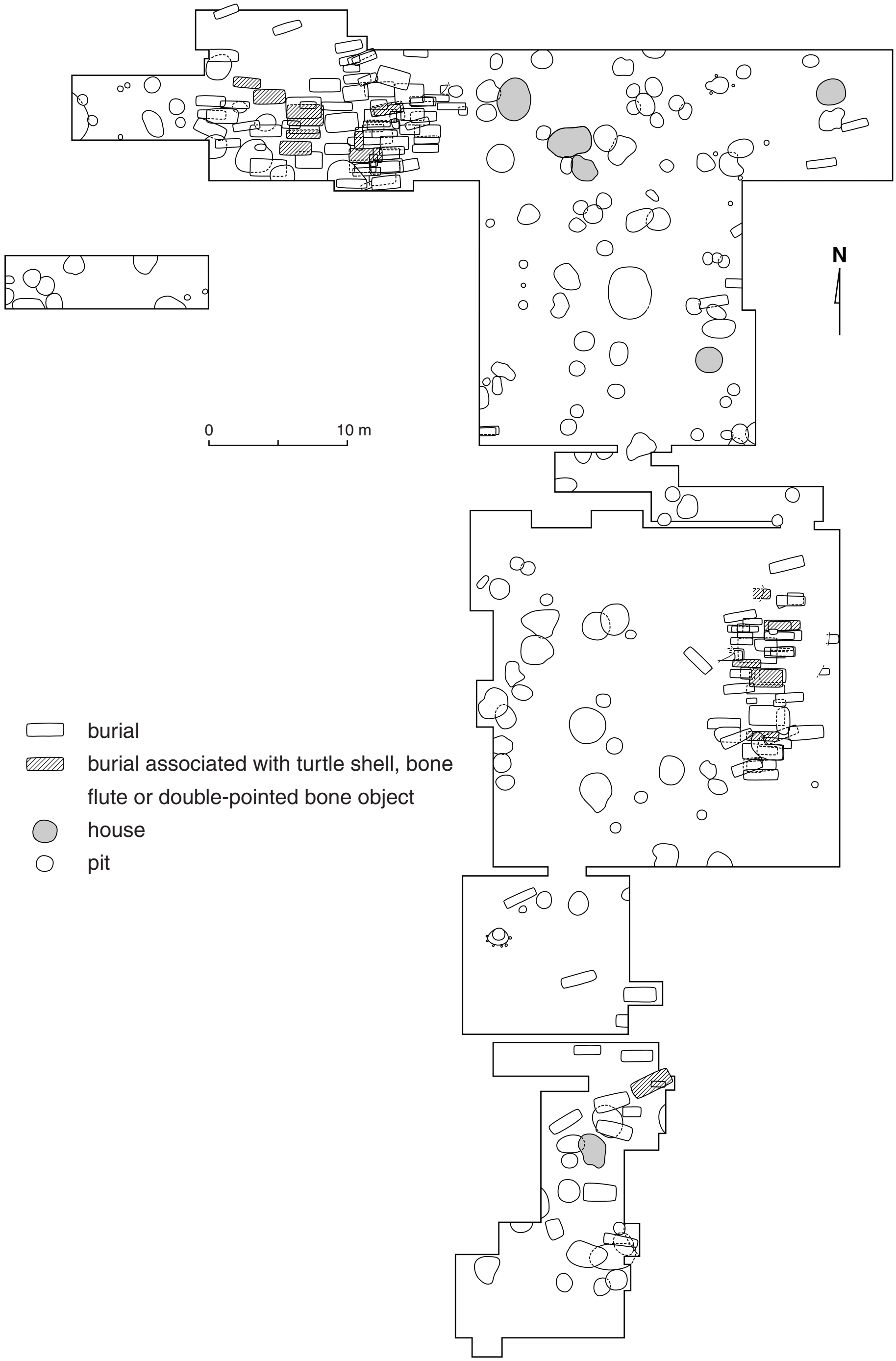


Figure 5.6 Distribution of burial clusters of Phase II at Jiahu in Henan, early Peiligang culture; indicating the locations of burials associated with ritual objects (adapted from Henan Institute 1999: figs. 327, 328, 329).

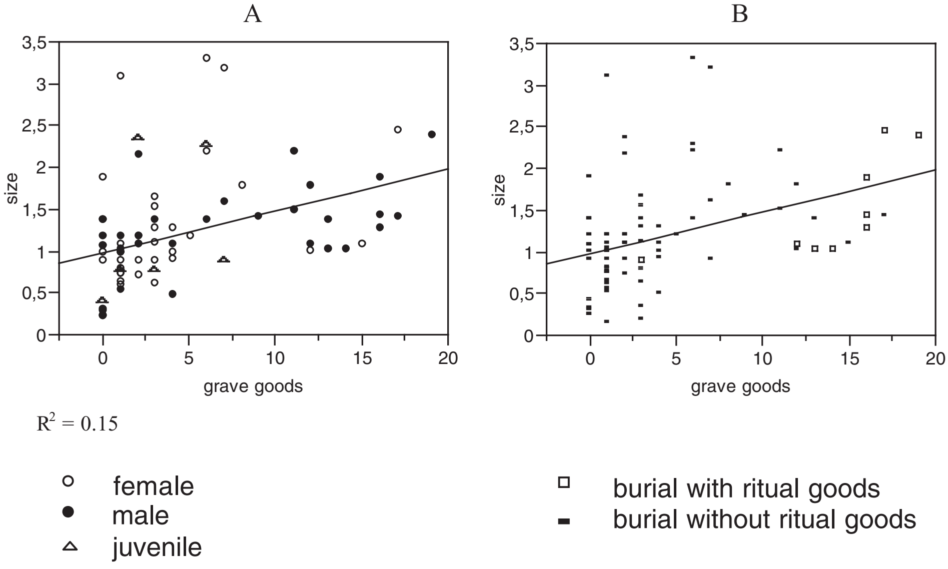


Figure 5.7 Plot showing the correlation between burial size and the number of grave goods from Jiahu Phase II, early Peiligang culture; (A) distribution by age and sex; (B) distribution of burials with ritual goods.

Appendix 7.1). The associated individuals, who received special mortuary treatments, apparently enjoyed some degree of high social status. These tombs, however, were spatially situated within burial groups, without spatial segregation from the rest of the tombs at the site (Figure 5.6).

As discussed in chapters 3 and 4, Jiahu was an economically self-sufficient segmentary society, organized by kin-groups, and its burials demonstrate a low frequency of gender-specific tools. The mortuary pattern described above supports the conclusion that Jiahu represents an egalitarian society. Although some individuals may have played a special role in ritual activities, they were unlikely to assume long-term economic privilege over other members of the community.

Shuiquan: The excavation of the Shuiquan site in Jiaxian, Henan (Figure 5.1), dating to late Peiligang (ca. 5300 BC), has revealed a large part of a well-arranged cemetery. A total of 120 burials (including both single- and double-interment tombs) were distributed into two groups separated by an empty linear space (Figure 5.8). Based on the analysis of 115 single-interment tombs, the burial sizes range from 0.8 to 4.08 m^2, with the CV of 0.67. All grave goods are utilitarian items, predominantly ceramic utensils and stone tools. The numbers of grave goods vary between 0 and 21, with the CV of 0.78 (Appendix 7.2), which is much higher than that of the Jiahu assemblage. However, the plot shows a low correlation between grave size and number of grave goods ($R^2 = 0.21$). The relatively high CV values are mainly attributable to the largest tomb (M29), which was 4.08 m^2 in size, associated with 21 grave goods which are all utilitarian items including pottery and stone tools (Figure 5.9). This burial was situated in the middle of the western section of the cemetery, with no sign

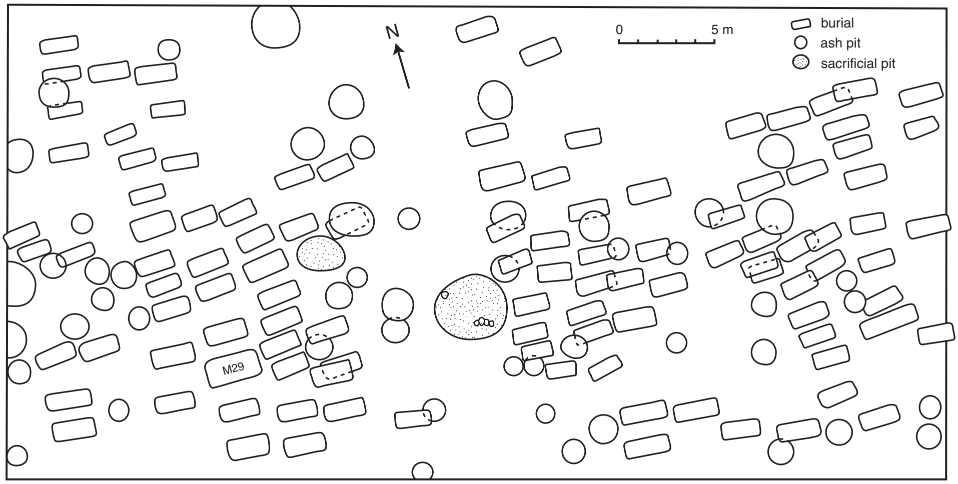
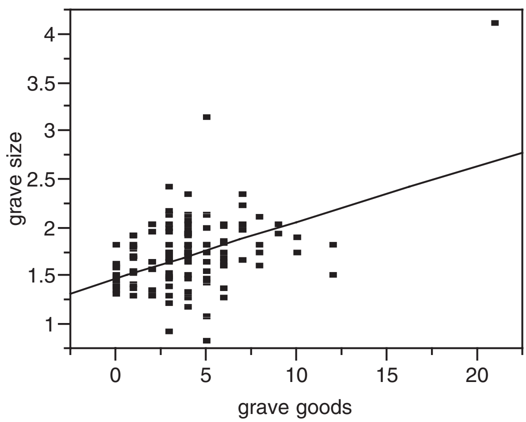


Figure 5.8 Distribution of burials at Shuiquan in Henan, late Peiligang culture; showing that two sacrificial pits are located in the center of two groups of tombs (adapted from Henan 1st Team 1995: fig. 9).



$R^2 = 0.21$

Figure 5.9 Bivariate plot showing the correlation between burial size and the number of grave goods from Shuiquan in Henan, late Peiligang culture.

of spatial segregation from other smaller tombs (Figure 5.8). Social differentiation within the Shuiquan community, therefore, was probably minimal.

Interestingly, two pits, one filled with burnt clay and stones, and the other containing animal bones, were found in the unoccupied linear area between these two burial groups (Figure 5.8). The burnt clay may have been the result of a type of ancient ritual, in which people intentionally removed part of the residential structure of the deceased and placed it near the tomb (cf. Wang Renxiang 2001). The excavators suggested that these pits were probably related to ritual activities taking place in the cemetery (Henan 1st Team 1995). Other scholars have argued that these ritual activities, perhaps including animal sacrifice and ritual feasting, were the earliest evidence

Figure 5.10 Distribution of burials and pits at Longgangsi in Shaanxi, showing that burials are surrounded by sacrificial pits (adapted from Shaanxi Institute 1990: figs. 8, 47, 48).

for the practice of ancestral cults conducted by a kin-related community (Lee and Zhu 2002). The location of the sacrificial features in the Shuiquan cemetery also indicates that intentional ritual activities were designated to all of the deceased. It is likely that the earliest ancestral cults were group-oriented activities in egalitarian societies.

Middle Neolithic period Burials in the Central Plains region during the middle Neolithic period continue to show the practice of group-oriented ancestral cults in egalitarian societies (e.g., at Longgangsi and Hongshanmiao). However, there is evidence to suggest the earliest development of social inequality within kin-groups (e.g., at Shijia).

Longgangsi: The Longgangsi site in Nanzheng, Shaanxi (Figure 5.1), was a cemetery dated to the early Yangshao period (ca. 5000–4000 BC). A total of 168 burials were found to be surrounded by 150 sacrificial pits (during Phases V and VI), which were filled with ash, small pieces of charcoal, pottery sherds, burnt clay, crop seeds, stone tools, and unbroken pottery vessels (Figure 5.10).

The cemetery had both single-interment and multiple-interment burials, with the latter larger in size and more numerous in grave goods (Figure 5.11A). In order to avoid the variation caused by different burial methods, I analyzed

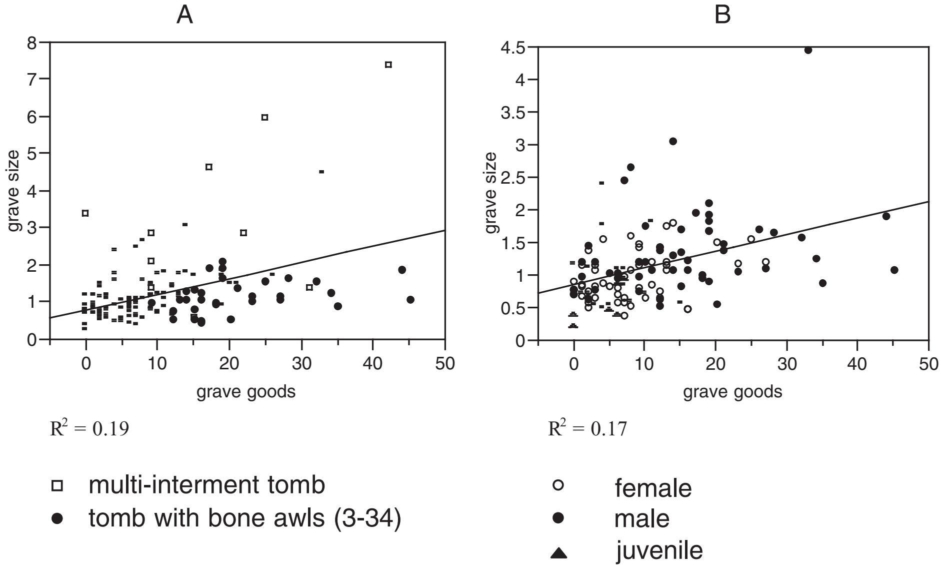


Figure 5.11 Bivariate plots showing the correlation between burial size and the number of grave goods from Longgangsi, early Yangshao culture; (A) all burials; (B) single-interment burials.

156 single-interment tombs. The results show that the grave sizes range from 0.24 to 4.46 m^2 with the CV of 0.57, and the numbers of grave goods from each tomb vary from 0 to 45, with the CV of 0.89 (Appendix 7.3). The correlation between these two variables is weak ($R^2 = 0.17$). The juvenile and female burials tend to be smaller in size and with fewer grave goods than the male burials (Figure 5.11B). However, if we examine the types of grave goods found in those relatively "rich" burials, it is apparent that a single type of grave good, bone awls, was responsible for the high variability indicated by the CV value of 0.89. A total of 36 tombs contain bone awls, ranging from 3 to 34 in number, or from 17 percent to 80 percent of the total number of grave goods in each tomb (Figure 5.12). The majority of occupants of these tombs were male (25 male, 1 possible male, 5 female, 3 possible female, and 2 unidentifiable), suggesting that it was mainly men specializing in some kind of craft production who used bone awls. The high variability in the number of grave goods, therefore, does not indicate social differentiation in the community, and the society is more likely to have been egalitarian in nature.

Situated about 30 m east of the residential area, the 150 sacrificial pits related solely to the burials appear to have been facilities used for ritual purposes (Shaanxi Institute 1990; Wei Jingwu and Yang 1993), such as ancestral cult ceremonies dedicated to the deceased. These pits were distributed around the edges of the burial site, and were associated with the entire cemetery rather than with individual burials (Figure 5.10). The spatial arrangement of these sacrificial pits characterizes them as community-oriented rituals dedicated to group ancestors in an egalitarian society, a situation similar to that of the Shuiquan site from the Peiligang period.

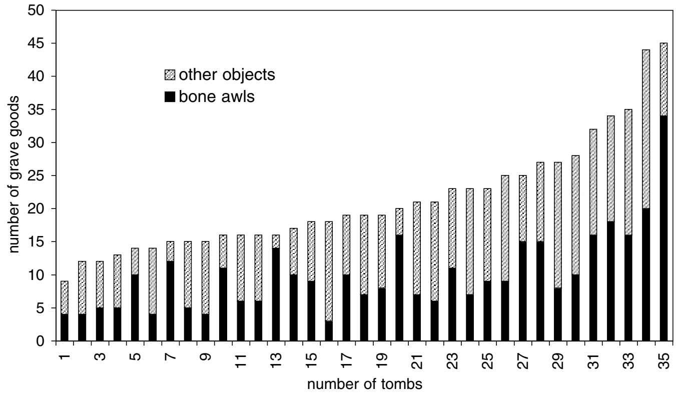


Figure 5.12 Proportions of bone awls found in grave goods from relatively "rich" tombs at Longgansi, early Yangshao culture.

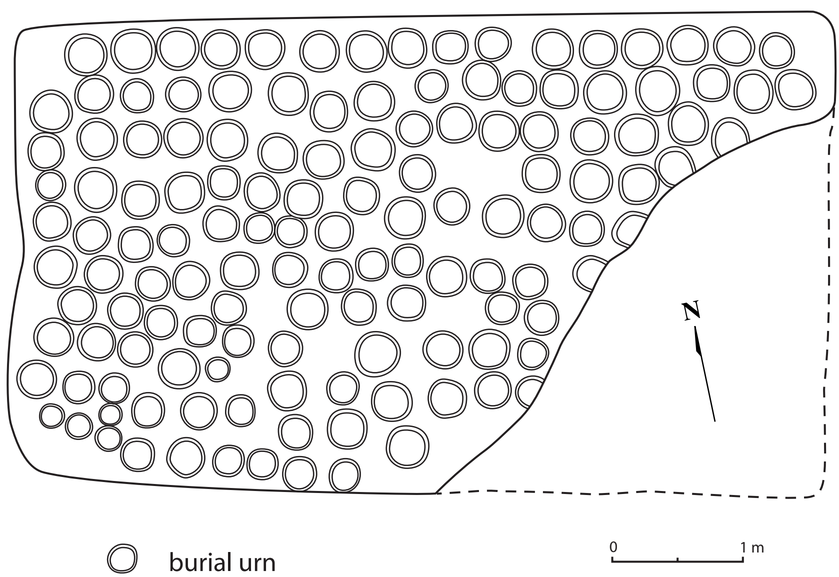


Figure 5.13 Plan of the Hongshanmiao cemetery site, in Henan, Middle Yangshao period (Miaodigou phase).

Hongshanmiao: Hongshanmiao is a burial site found in Ruzhou, Henan (Figure 5.1), dating to the Miaodigou phase (ca. 4000–3500 BC). A total of 136 burial urns were carefully arranged within an area of 22 m^2 (Figure 5.13). These were secondary burials, and each urn contained bones from one child or adult individual. Many burial urns were painted with polychrome designs, and some were rendered with reliefs. The major themes of these representations are animals, humans, plants, cosmologic objects such sun and moon, and fertility symbols. There is no evidence of social differentiation of any kind at this cemetery, since all age groups and both sexes were present, and few grave goods were associated with burials (Henan

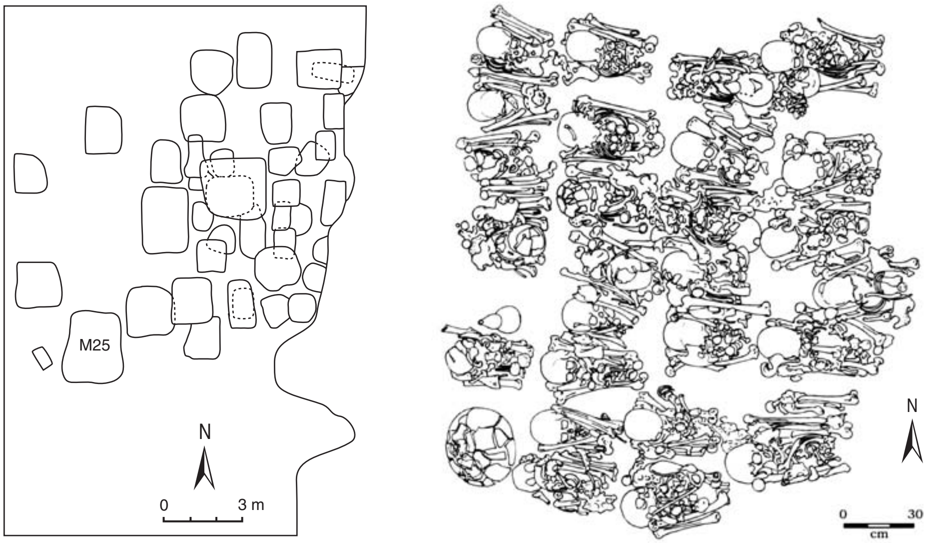


Figure 5.14 Plan of the Shijia cemetery site and a secondary burial pit (M25) from the site (adapted from Xi'an Banpo Museum 1978: figs. 2, 7).

Institute 1995). An osteological examination of the Hongshanmiao skeletons suggests poor community health (Zhang Zhenbiao and Yuan 1995), indicating that the population was under stress (see chapter 4).

The burial pattern of this cemetery indicates collective mortuary practice, by an egalitarian society. This community-oriented ritual activity, together with the cognitive symbols focused on natural objects/deities and fertility cult, points to social values based on the survival of the entire social group represented by this cemetery.

Shijia: The Shijia site, about 2 ha in area, is located in Weinan, Shaanxi province (Figure 5.1). This site represents a variant of the Yangshao culture, dating to ca. 4300–4000 BC (Gong 1988). The excavation in 1976 located a Yangshao culture cemetery in which 43 graves were found within an area of 250 m^2. Among these graves, 40 were secondary burials with multiple interments, from which a total of 727 individuals were identified, including skeletons of both sexes and from all age groups (Figure 5.14). The number of interments per grave ranged from 4 to 51 (Xi'an Banpo Museum 1978). The results of osteological analysis indicate that the phenotypic traits of skeletons are homogeneous within graves but heterogeneous between graves, suggesting that relationships among the individuals buried in the same grave are consanguineal rather than affinal, and that each grave may have contained members of an extended family or lineage (Gao, Q. and Lee 1993: 289).

The sex ratios of individual graves, and of the Shijia cemetery as a whole, are heavily weighted in favor of males, and indicate the existence of differential mortuary treatment based on gender. It is possible, according to Gao, Q. and Lee (1993: 289–295), that return burial or re-burial was employed and residency was arranged patrilocally. This practice implies that many female adults, who married out to other villages, may have not been buried there or were re-buried with their natal families, if the burial ritual involved a homeward transfer of the bodies or the skeletal remains. By contrast, the males of the kin group, who stayed in their natal villages, were more likely to be buried in the patrilineal cemetery.

The Shijia burial indicates a sex ratio biased against females, which is especially evident in middle and older groups, but may not be evident in the younger age group since dead unmarried females were more likely to be buried with their natal groups (Gao, Q. and Lee 1993: 292). An unbalanced sex ratio has been noticed at many Yangshao burial sites, especially in cases of multiple secondary burials (Chen Tiemei 1990; Xin 1991). Several Yangshao sites in the same region, such as Yuanjunmiao and Jiangzhai (Figure 5.1), also have a sex ratio pattern similar to that of Shijia (Figure 5.15). This gender-based, unequal treatment in secondary burials provides

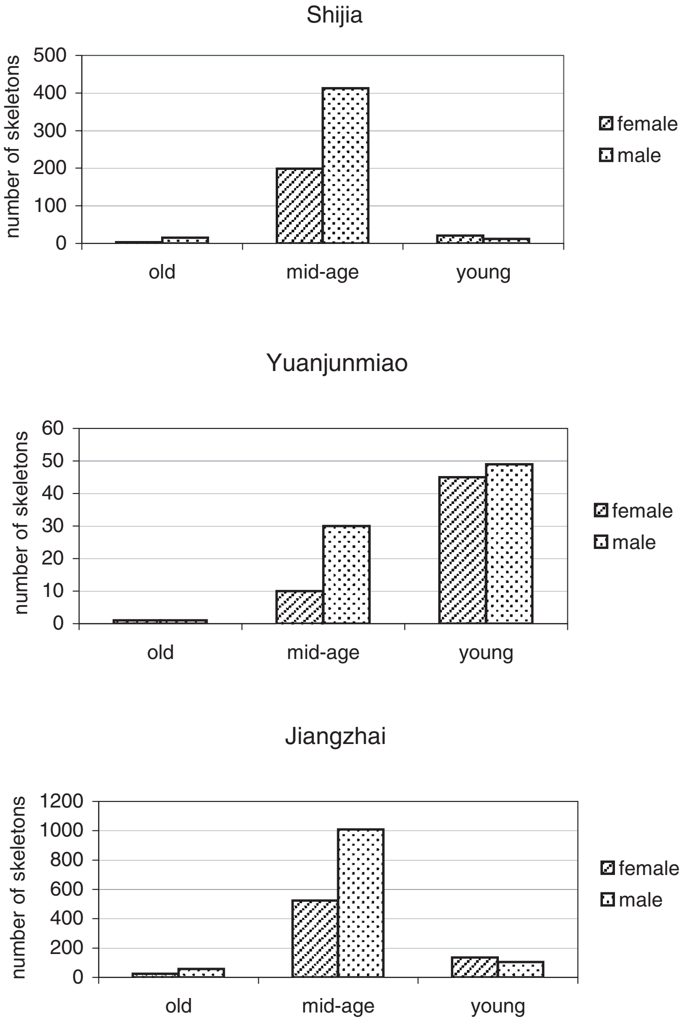


Figure 5.15 Sex ratios among different age groups from Shijia, Yuanjunmiao, and Jiangzhai in Shaanxi, Yangshao period.

an important clue for understanding the development of ancestral cults. In patrilocal societies in the later part of the fourth millennium BC, women who married out into other communities, and so were perhaps of little importance economically and politically for their natal kin communities, were the first group to be alienated in the mortuary practices through which the dead were transformed into ancestors. This phenomenon signifies a starting point in the archaeological record, when people began to treat some of their dead forebears differently in ancestral cult rituals, even though their societies were still egalitarian in nature and strongly bound by consanguineal relations. Ancestral cults, therefore, began to change their egalitarian nature, and became a type of ritual which separated deceased members of a community into two categories – ancestors and non-ancestors – in the religious realm.

The large number of interments in each burial pit indicates that ancestors were still venerated collectively as a group. However, since the numbers of interments in different burial pits vary considerably and each burial pit may represent a kin-group, the rituals were probably performed by kin groups at various levels ranging from extended family to lineage (Gao, Q. and Lee 1993: 294), corresponding also to the level of the social group which conducted the ritual. Given that the Shijia cemetery consisted of a number of burials belonging to different families and lineages, it is possible that higher levels of social organization also performed the ritual, such as a multi-lineage group constituting the larger local community.

The Yangshao culture, distributed mainly across the middle Yellow River valley, reveals burial patterns with little evidence of social difference. However, considering that large public buildings used for communal activities were constructed at several large Yangshao settlements (e.g., Xipo, Dadiwan, and Anban; see chapter 4), it may be argued that the interests of kin-groups, rather than those of individuals, were the focus of most Yangshao communities.

Late Neolithic period During the late Neolithic period the Longshan culture developed in the Central Plains. There are several noticeable changes in associated mortuary practices: ancestral rituals were practiced for few individuals in the community; and prestige items, often occurring as exotic goods, became closely associated with elite burials. The cemetery at Taosi has revealed the best data for these changes.

Taosi: The Taosi site in Xiangfen, southern Shanxi (Figure 5.1) is the largest Neolithic site (300 ha) yet to be found in China. It includes both cemetery and settlement areas. In the cemetery (3 ha) several thousand burials were discovered, and over a thousand have been excavated (Shanxi Team 1980b, 1983). Since the excavation report has not been published, I am unable to conduct quantitative analysis on the mortuary remains.

According to the analysis of the excavators, these burials can be divided into three classes on the basis of their grave furnishings: large (1.3 percent of the total burials), medium (11.4 percent), and small (87 percent), together demonstrating a pyramid-shape hierarchy (Figure 5.16). The large burials, 3 m long and 2 to 2.7 m wide,

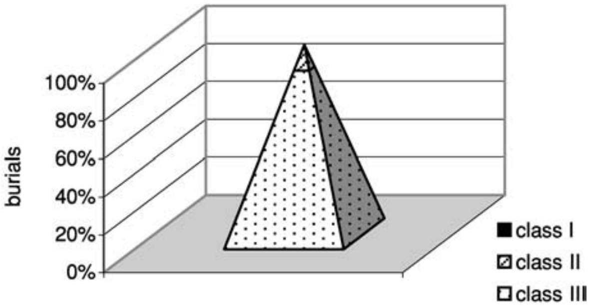


Figure 5.16 Pyramid-shaped distribution of the burial hierarchy observed at Taosi in Shanxi, late Longshan period.

were all occupied by males; each contained a wooden coffin, pulverized cinnabar, and 100 to 200 grave goods. The medium burials were smaller in size, 2.2 m long and 0.8 m wide; each had a wooden coffin, spread cinnabar, and a few dozen grave goods. The small tombs were narrow vertical pits, 2 m long and 0.4 to 0.6 m wide; each had few or no grave goods. Each of the three classes is further divisible into two or three subclasses (Gao Wei *et al.* 1983). The artifacts found in the first subclass of large tombs constitute the richest array of grave goods found in any Neolithic tomb in the Yellow River valley; they include red pottery plates painted with dragon designs, alligator drums, pottery drums (Figure 5.1C), jade objects, giant chime stones, large V-shaped stone knives, painted wooden vessels, and whole pigs (Gao Wei 1989: 239).

The presence of alligator drums and jade ritual objects in the largest tombs at Taosi suggests the existence of a long-distance exchange of ritual goods among high-level elites. Alligator drums, or at least alligator skins, were probably obtained from the eastern coast region. Jade ritual objects, such as the *yu* axe and the *cong* tube (Figure 5.4), share standard forms with those found at many other sites in northern Shaanxi, Shandong, and the region of the Liangzhu culture. This indicates that elites in different regions exchanged certain types of elite goods, such as valuable ritual objects, and that they shared certain ritual knowledge and practices (Liu, L. 2003).

The Taosi cemetery is partitioned into several sections, and each section seems to be further divisible into several clusters, which may have belonged to different families or lineages. In some clusters, the burials were laid out in neat rows, with large tombs located in the center of the rows and medium and small ones placed on the two sides (Gao Wei *et al.* 1983: 532–533). In Section III of the cemetery (Figure 5.17), for example, the five largest tombs (which yielded alligator drums and giant chime stones) were closely spaced, while six medium-size tombs were situated on the sides of the large tombs. About one hundred small burials were situated next to the medium-size tombs (Shanxi Team 1983: 32). The skeletons in the large tombs were all identified as male; those in the medium tombs were all female (Gao *et al.* 1983: 533). Based on pottery styles, the five large tombs were not contemporaneous, suggesting that they were filled over several generations by a kinship group (Gao *et al.* 1983: 534). The evidence indicates that social status was probably ascribed, so that

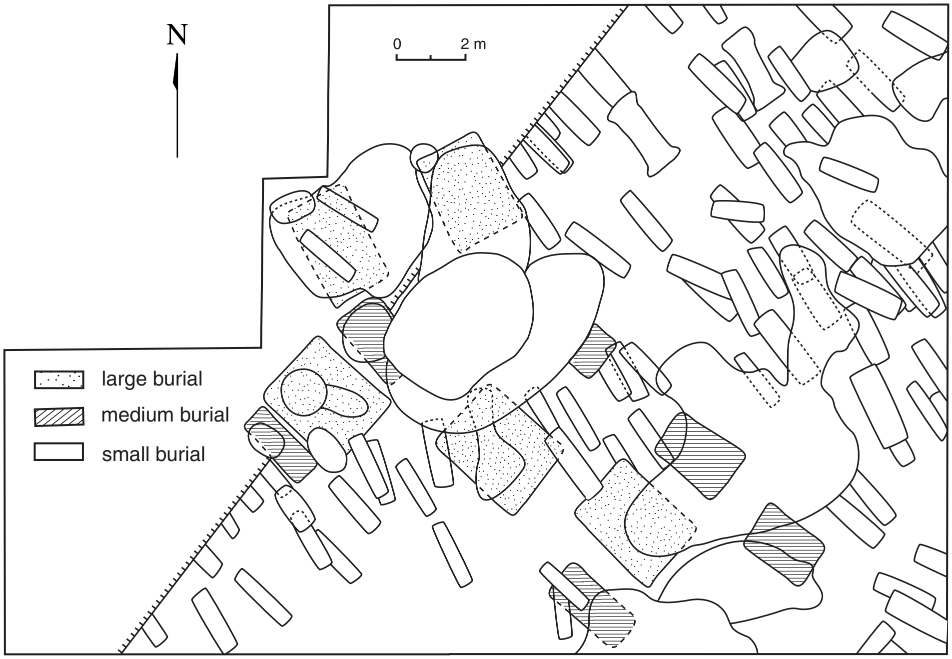


Figure 5.17 Burial distribution of section III at Taosi in Shanxi, showing hierarchically organized burial patterns, late Longshan period (adapted from Shanxi Team 1983: fig. 4).

male members of the most elite family or lineage held the highest social status over several generations. This is some of the earliest evidence for hereditary social status in the Neolithic period.

Since no osteological study of human remains from Taosi burials has been published, the exact nature of the relationships between the deceased in tombs of different ranks remains unclear. It is possible, based on the regular distributional patterns at the cemetery, that most of the deceased buried in the same section of the cemetery were kin of varying degrees, although we cannot rule out the possibility that some occupants of the lower-ranking burials were domestic servants of the elites buried in the large tombs. The elite burials form the center of the burial cluster in a cemetery which includes both elites and commoners, most of whom were kin, indicating that basic kin groups (families or extended families) were internally stratified.

Archaeologists recently unearthed a cemetery at Xiajincun in Linfen, about 15 km northwest of Taosi (Figures 5.1, 6.11). It measured more than 1.7 ha in original size and dated to the early Taosi period. Excavations, which only uncovered a small part of the cemetery, yielded 52 burials. The material remains from these burials share many similarities with those found at Taosi, and can be classified into three classes based on the size and furnishing of the graves. The first- and second-class burials were large in size and contained jade, wooden, stone, and ceramic items, equivalent to the medium tombs found at Taosi; the third-class burials were small in size and associated with few grave goods, equivalent to the small tombs at Taosi (Shanxi

Linfen and Shanxi Team 1999). These data suggest that mortuary hierarchy also existed on the regional level, and that the most elaborate high-ranking burials only occurred at the Taosi site, which was the primary center in the region (see chapter 6).

Summary: During the early and middle Neolithic period many communities on the Central Plains shared a strong tradition of group-oriented ancestral cults, which correlated with egalitarian social systems. A new development took place during the Longshan period, illustrated at the site of Taosi, with the appearance of individual-oriented ancestral cults, correlated with the emergence of social stratification in mortuary practice. This change, however, seems to have been an exception in the region, since most Longshan sites provided no evidence for hierarchically organized burials. At these sites, burials were often placed near houses, and the deceased were sometimes buried in ash pits (see chapter 3). In most Longshan societies in this region, mortuary events consumed little civic energy, which instead was focused on other activities, such as the construction of large public buildings and rammed-earth walls (chapter 4).

Lower Yellow River region

The lower Yellow River valley witnessed the development of the Dawenkou and Longshan cultures during a great part of the Neolithic period. These two cultures, characterized by their elaborate burials with abundant grave goods, demonstrate very different mortuary patterns from their contemporary cultural counterparts on the Central Plains.

Dawenkou culture The excavations of sites from the Dawenkou culture (ca. 4300–2600 BC), distributed mainly in Shandong, Jiangsu, and Anhui, have revealed the earliest evidence of emerging burial stratification in the entire Yellow River region. At its type-site, Dawenkou (Figure 5.1), excavations in the 1970s found 56 burials dated to the early Dawenkou period, which were further divided into three phases (I–III). These burials appear to be arranged in rows and grouped into three clusters (A, B, and C) (Figure 5.18).

Tombs dating to Phase I (ca. 4100–4000 BC) were small in size and associated with few grave goods. Burial patterns changed in Phase II (ca. 4000–3800 BC), when a small number of tombs each had up to 67 to 97 grave goods (including pottery, tools, personal ornaments, and pig mandibles), and most well-furnished tombs occurred in Group A. Phase III (ca. 3800–3700 BC) continued to show pronounced mortuary segregation, as two large tombs became the focus of Group A (Figure 5.19A, B). One of these two large tombs (M2005) was constructed with an *ercengtai* ledge and associated with 106 grave goods (Figure 5.2), and the other, a juvenile burial (M2007), had 45 grave goods. Two small tombs situated nearby had no grave goods at all (Shandong Institute 1997a) (Figure 5.18).

The analysis of 46 burials dated to Phases II–III illustrates that the burials range from 0.42 to 8.12 m^2 in size and from 0 to 106 in number of grave goods. The correlation between these two variables is stronger than those from the Yangshao and Peiligang sites ($R^2 = 0.48$). Female burials were clearly smaller in size and had

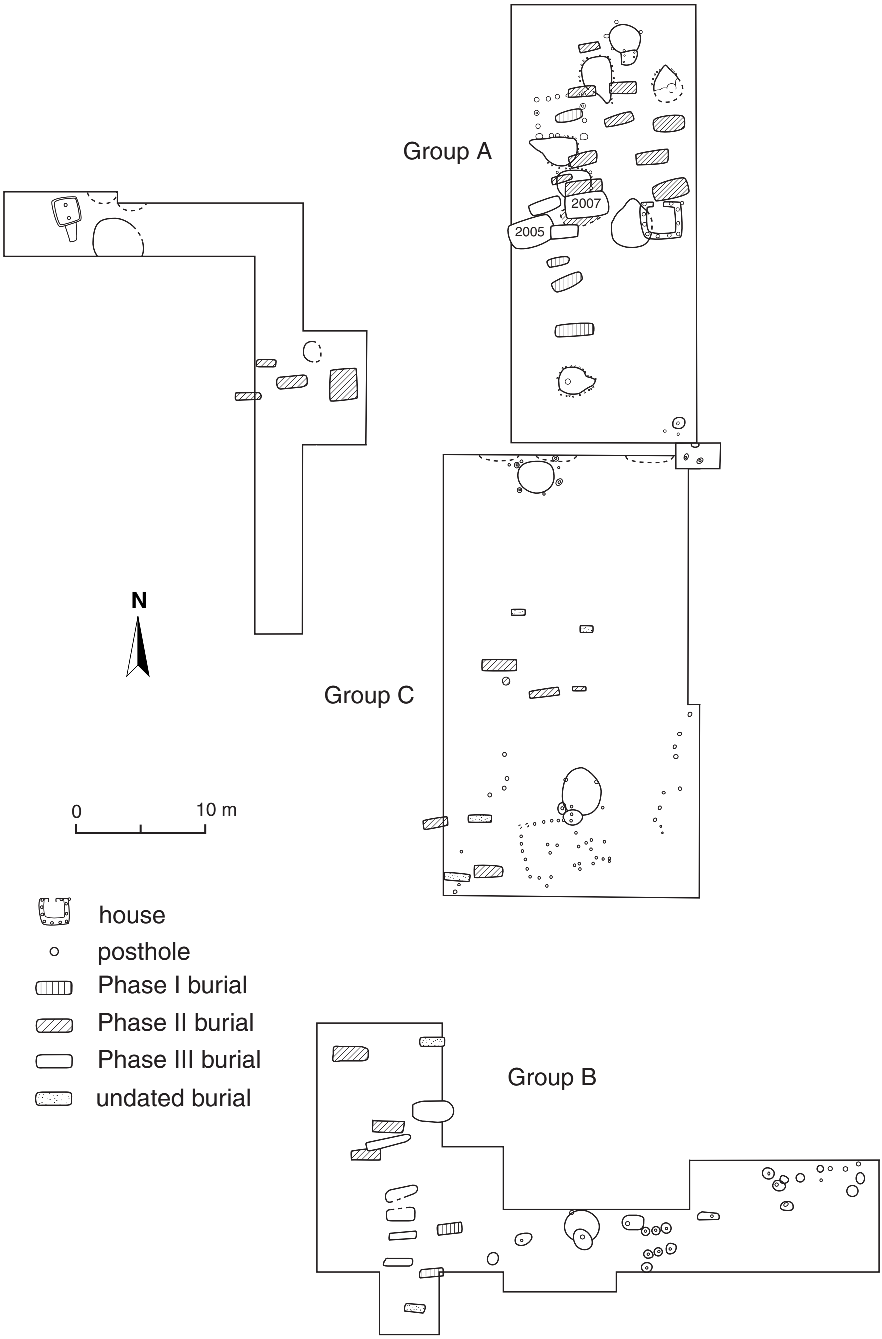


Figure 5.18 Distribution of three burial groups at Dawenkou in Tai'an, Shandong, early Dawenkou period (most ash pits are not shown in the drawing) (adapted from Shandong Institute 1997a: figs. 3, 5, 7, 9).

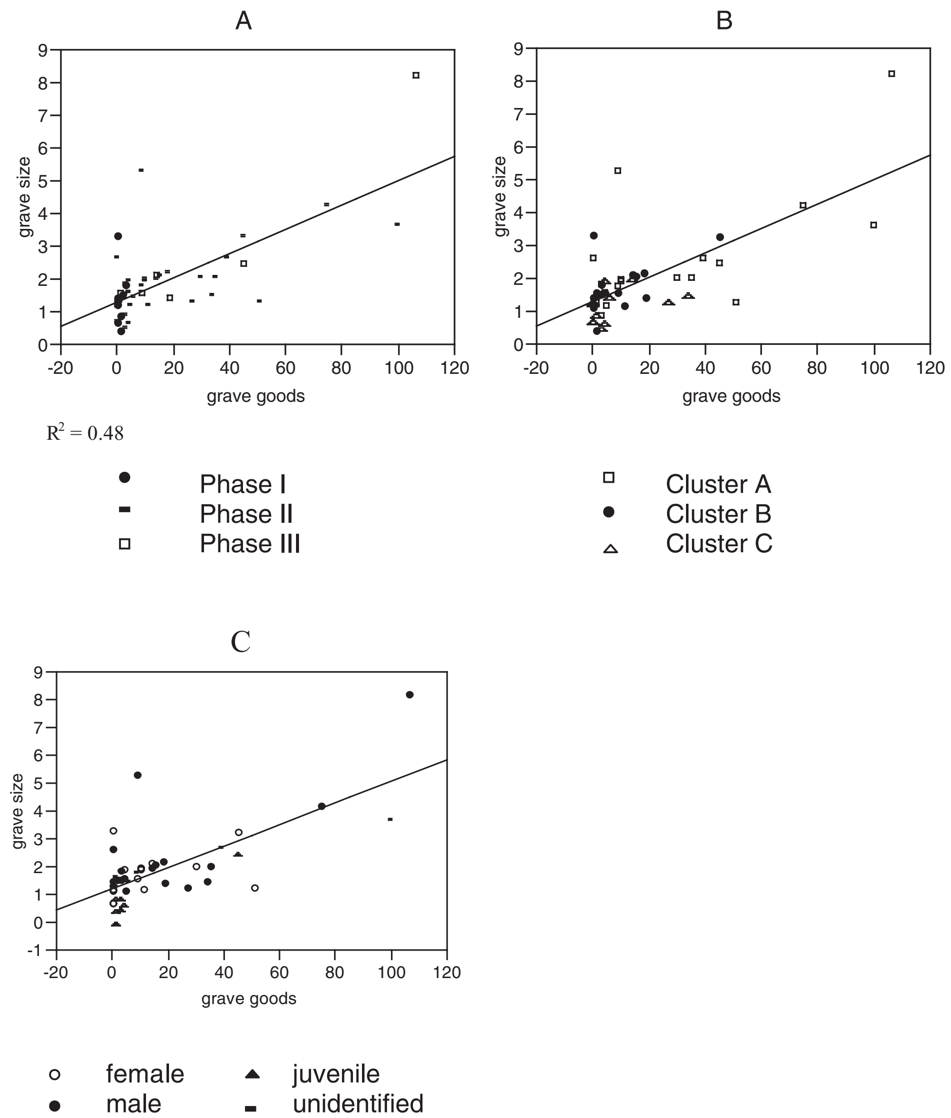


Figure 5.19 Bivariate plots showing the correlation between burial size and the number of grave goods from Dawenkou in Shandong, early Dawenkou culture. (A) burial distribution by phase; (B) burial distribution by spatial groups; (C) burial distribution by sex and age.

fewer grave goods than male burials (Figure 5.19C); and the variability in numbers of grave goods from all burials (CV = 1.36) is higher than among those from the Yangshao and Peiligang sites (Appendix 7.4). The burial patterns revealed here show the emergence of mortuary stratification in a settlement over a four-hundred-year period.

Burial stratification developed at many sites during the middle and late Dawenkou culture period. Many large tombs contain 100 to 200 grave goods, while small ones may have only few (Luan 1996a: 103–202). Items which may be related to high social status or ritual functions, such as turtle shells, carved cylinders made of ivory or bones, jade, black pottery goblets, pig mandibles, and *dakouweng* vessels bearing pictograms, were found to be primarily associated with rich tombs (Luan 1996a: 181–185, 190–193; 1997b). Underhill has analyzed differences in grave form, size, and quality and quantity of goods at the Dawenkou site dating to the middle and late Dawenkou periods, and concluded that there was an overall increase in the number of graves with markers of status throughout this period, and an increase in the diversity of labor-intensive or hypothesized prestige goods in the late Dawenkou phase (Underhill 2000). Both male and female skeletons have been identified in large tombs. The occupant of the most elaborate burial M10 at Dawenkou, for example, was an adult female (Shandong Bureau 1974), suggesting that there was no fixed gender hierarchy associated with mortuary practice, although in general men enjoyed higher social status than women did at that time.

Many Dawenkou burial sites in Shandong appear to be spatially separated into several distinct groups of tombs. Social stratification based on burial treatment among different burial groups within a cemetery can be observed at some sites, including Lingyanghe in Lüxian (Wang Shuming 1987a, b), Dazhucun in Lüxian (He Deliang 1991), Zaozhuang in Xinjian (He Deliang and Liu 1996: 164), and Yedian in Zouxian (Shandong Museum 1985: 134–135), all in the Shandong region.

Burial patterns of some Dawenkou sites in Anhui, exemplified by Yuchisi from the late Dawenkou period, seem to be less elaborate in grave furnishing than counterparts in Shandong, but still express clear mortuary hierarchy among the deceased. As discussed in chapter 4, dwellings at the sites can be divided into nine house groups, with 192 associated burials (Figure 4.13). These burials include 16 female, 37 male, 66 juveniles, and as for the rest, the sex/age are both unidentifiable. The grave sizes for all burials range from 0.07 to 3.11 m^2, with the CV of 0.75. Most large burials were constructed with the *ercengtai* ledge, but not all of them had large quantities of grave goods. The numbers of grave goods vary from 0 to 29, with the CV of 1.63, which is similar to that of the Dawenkou site (Appendix 7.5). The correlation between burial size and number of grave goods is slightly high, as indicated by the R^2 value of 0.39 (Figure 5.20A).

The two most elaborate burials, in terms of grave size and number of grave goods, belong to males; but on average females have more grave goods (judging from the mean: 4.63 for female vs. 3.24 for male), which are more evenly distributed among burials (based on CV: 1.35 for female vs. 2.15 for male) than those of males. Juvenile burials are evidently small in size and few in grave goods (Appendix 7.5). Six burials, both male and female, seem to have had high social status in this community, indicated by their high frequencies of grave goods, the presence of the *ercengtai* ledge, and concentrations of special mortuary items, including jade, pig mandibles, and deer tusks (Figure 5.20B–D). They are distributed in four residential groups, suggesting that social stratification had developed within kin groups, and that a number of kin groups in this community were competing for status. Since not all house groups were associated with elaborate burials, social differentiation may have also existed among kin groups.

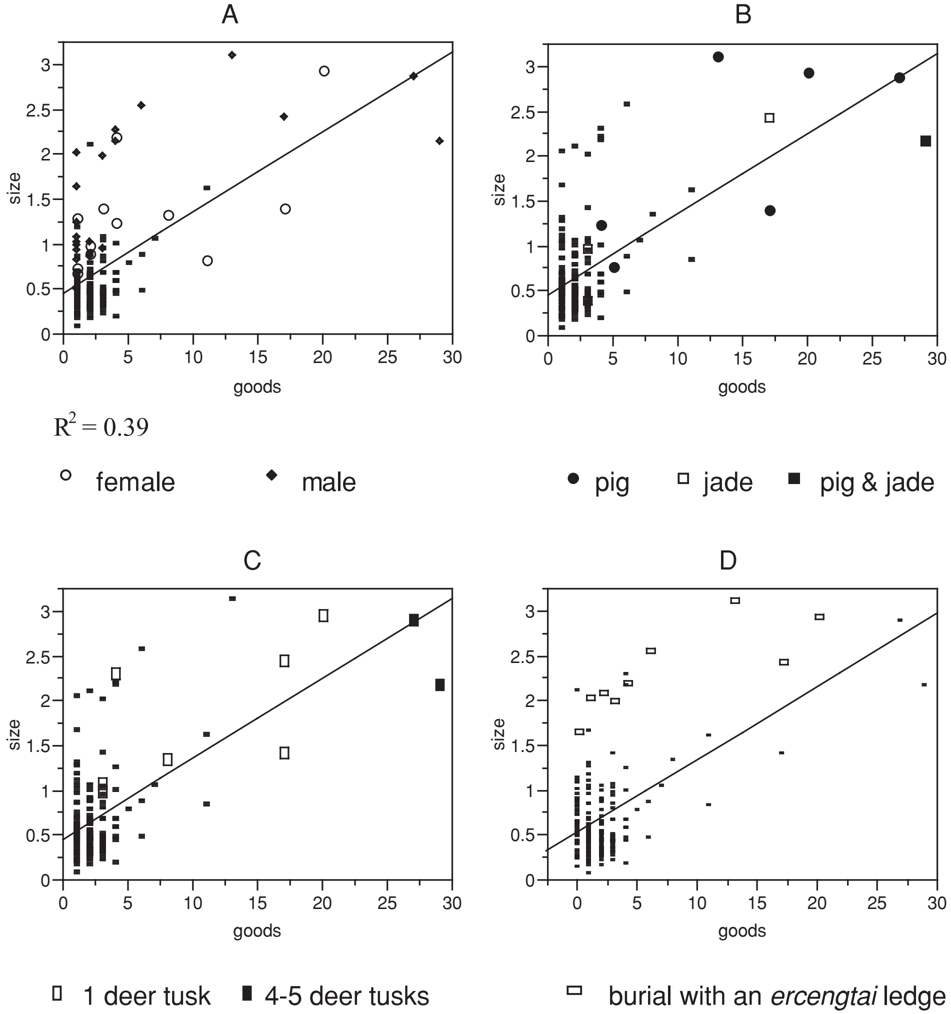


Figure 5.20 Bivariate plots showing the correlation between the distribution of grave goods in Yuchisi burials, late Dawenkou period: (A) distribution of male and female burials based on grave size and grave goods; (B) distribution of burials associated with jade and pig mandibles; (C) distribution of burials associated with deer tusks; (D) distribution of burials associated with an *ercengtai* ledge.

The elaborate mortuary ritual traditions of Dawenkou culture have inspired some researchers to decode the symbolic implications of the burial patterns, focusing on burial rituals conducted by the mourners (Fung 2000; Keightley 1985). Fung (2000) analyzed the spatial patterns of grave goods within burials from several Dawenkou cemeteries, and suggested that there was an ideal mode of burial assemblage among the Dawenkou communities, which could be achieved only by those who had access to sufficient material and social resources. The variability of burial ritual practice among Dawenkou sites indicates emerging differences between communities which both created and shared such ritual practice. Dawenkou burial patterns, as Fung

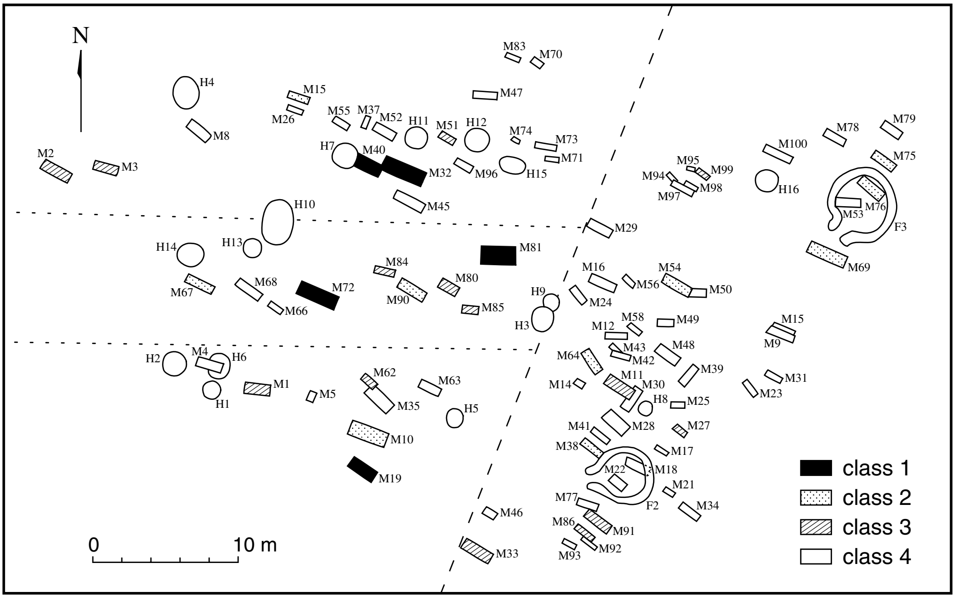


Figure 5.21 Spatial distribution of burials at Chengzi in Zhucheng, Shandong, late Longshan period (adapted from Changwei 1980: fig. 2).

(2000) argues, manifest a society in which hierarchy may have developed as a consequence of the burial rituals.

Dawenkou culture gradually developed mortuary stratification, which was closely associated with the emergence of social hierarchy within kin-based communities. This tradition was then continued and enhanced during the Longshan period.

Longshan culture Many Longshan sites in Shandong clearly show evidence of burial ranking and burial segregation within a kin-based community. These include the sites of Zhufeng in Linqu and Yinjiacheng in Sishui (Liu, L. 1996a). However, Chengzi exemplifies this development best of all.

Chengzi: The Chengzi site (2 ha) is located in Zhucheng, Shandong (Figure 5.1). A cemetery was found in the southeastern part of the site, in which the cultural deposits, datable to the Longshan culture, are divided into three phases: early, middle, and late (Changwei 1980). Within 1,300 m^2 of the excavated area, 14 pits and 87 burials, relatively contemporary in age, were unearthed (Liu, L. 1996a) (Figure 5.21).

The burial sizes range from 0.19 to 3.71 m^2, with the CV of 0.77; and the number of grave goods varies from 0 to 31, with the CV of 2.21 (Appendix 7.6), which is very high compared with other sites. The correlation between burial size and number of grave goods is relatively high, as indicated by the R^2 value of 0.58. The burials can be divided into four classes or ranks based on the characteristics of their furnishings, according to the excavators. The large graves were associated with *ercengtai* ledges and abundant grave goods, including prestige items, such as egg-shell pottery goblets and pig mandibles, while the small sized vertical pits were found with no grave goods

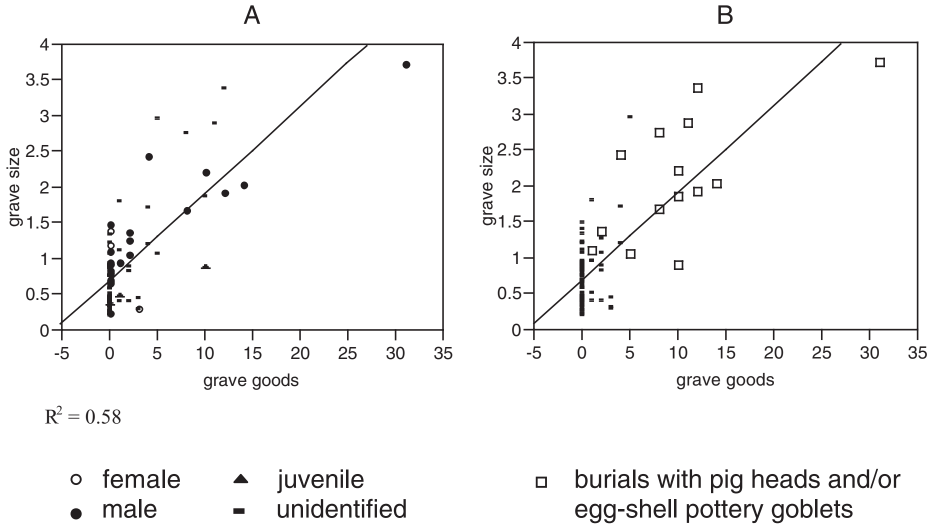


Figure 5.22 Bivariate plots showing the correlation between burial size and the number of grave goods from the Chengzi site in Shandong, late Longshan period; (A) distribution by gender and age; (B) distribution of burials with prestige goods.

(Changwei 1980). Percentages of the four burial classes, ranging from Rank 1 to Rank 4, are 6 percent, 13 percent, 20 percent, and 62 percent. The distribution of burial ranks appears to be pyramid shaped.

From the 87 burials, the sex of 25 skeletons has been identified. The male burials are considerably larger in size and more numerous in grave goods than the female burials, and skeletons in the first and second classes are all males. Most juvenile burials fall into the lower ranks of burials, except for one belonging to Class II (Figure 5.22A; Appendix 7.6). It is clear that males had higher social ranking than females, and that some juveniles enjoyed hereditary status in the Chengzi community. Notably, prestige goods, such as egg-shell pottery goblets and pig heads, occurred predominantly in higher-ranking burials (Figure 5.22B), suggesting a well-developed hierarchical mortuary system.

The cemetery was divided into two sections, separated by an empty linear space. Most lower-ranking burials were distributed in the eastern section, while higher-ranking burials were more concentrated in the western section. Moreover, the western section was further divided into three sub-groups of burials arranged in parallel rows, each containing different classes of burials (Figure 5.21).

These Longshan burials were associated with fourteen sacrificial pits. All of the pits were found in the western part of the cemetery, and most pits were filled with ashy soil, pottery sherds, animal bones, stone and bone tools, and unbroken pottery vessels. The pits had been filled once (Changwei 1980: 348). Interestingly, most pits were situated close to large burials, and all the dated pits are either contemporary with, or later than, the burials to which they are spatially close (Figure 5.23). Some pits were filled with ashy soil, and yielded pig mandibles, pottery vessels, stone and

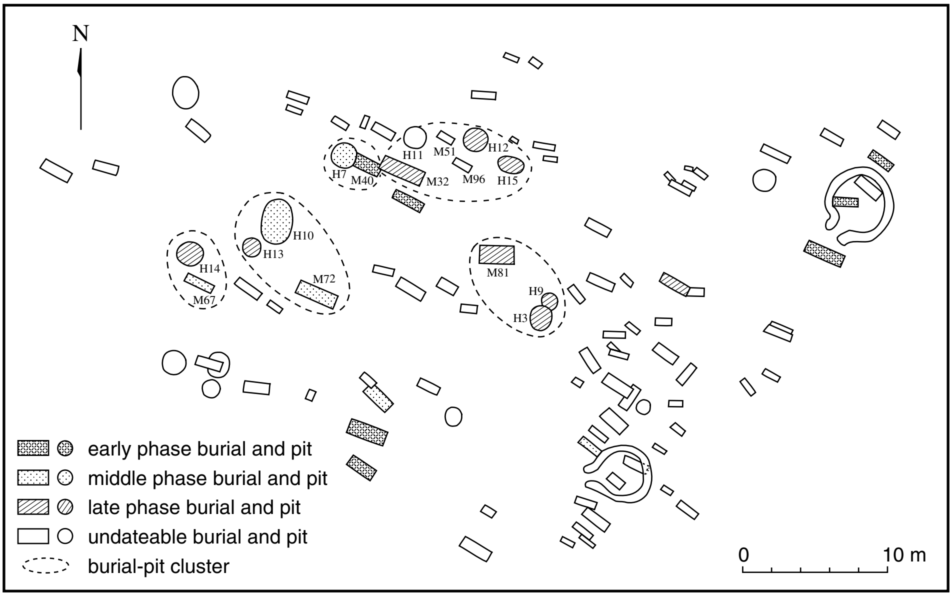


Figure 5.23 Distribution of burial-pit clusters at Chengzi in Zhucheng, Shandong, late Longshan period; only those burials in the first and second ranks are marked.

bone implements, and abundant potsherds and animal bones (Changwei 1980: 348). If these vessels and animal bones were the remains of ritual feasting and sacrificial offerings in mortuary rituals performed near the burials, it would appear that the pits were dug both at the time of burial, and also in conjunction with later commemorative sacrifices. Such ongoing ceremonial activities strongly suggest ancestral rites (Liu, L. 1996a).

Since the largest burials were not located in the eastern section of the cemetery, and the sacrificial pits were concentrated in the western section, the western section seems to have been occupied by a kin group consisting of three segments (each occupying one of the three sub-groups of burials), in which there were more individuals with higher social rankings than those in the group buried in the eastern section. The three sub-groups of burials (ranging from eight to nineteen tombs) probably represent three extended families. The implication of the arrangement of burials in the cemetery is that social hierarchy not only existed between different kin groups, but also within such groups, a situation also manifested in the Yuchisi burials.

It appears that some deceased male adults with high status received the richest sacrificial offerings at ancestral rituals in the Chengzi community, but this situation, of women's social position being lower than men's in the Longshan period, may not have been universal. At the Sanlihe site in Shandong, female burials make up the greater percentage of the highest-ranking burials (Institute of Archaeology 1988a).

Summary: In the lower Yellow River region hierarchical social distinctions between kin groups and between the individuals within a kin group may have begun during the Dawenkou period, and then continued in Longshan times. Elaborate

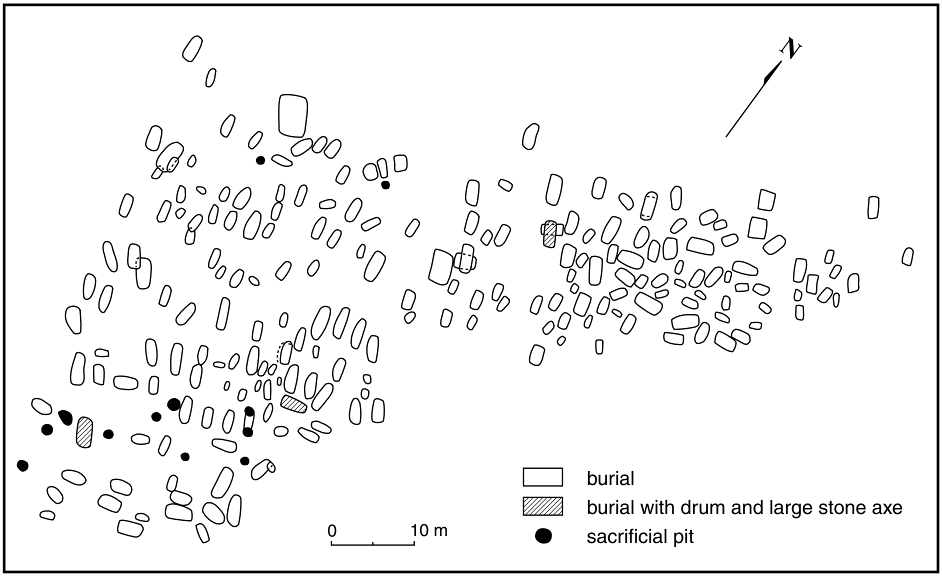


Figure 5.24 Distribution of burials and sacrificial pits at Yangshan in Minhe, Qinghai, late Majiayao period (adapted from Qinghai Institute 1990: fig. 3).

funerary ceremonies were directed primarily toward individual ancestors, especially male ancestors. Such ritual practice may have in turn stimulated the development of social hierarchy, and enhanced the high social statuses of some individuals and kin groups.

Upper Yellow River region

The Majiayao and Qijia culture (ca. 3100–1900 BC) flourished in the upper Yellow River region during the late Neolithic period. The Majiayao culture, characterized by elaborate painted pottery in burials, is regarded as an egalitarian society. The Qijia culture, using pronounced gender differentiation and status markers (such as jade/stone *bi* disks) in mortuary contexts, was apparently a stratified society. Two sites, Yangshan and Huangniangniangtai, are the next examples to be analyzed.

Yangshan: The Yangshan site (0.7 ha) in Minhe, eastern Qinghai province (Figure 5.1), is a cemetery of 218 tombs and 12 pits (Figure 5.24) (Qinghai Institute 1990). This site is dated to the middle and late Banshan phase of the Majiayao culture (the Banshan phase dated to ca. 2600–2300 BC). The cemetery may have been partitioned into several sections and sub-sections, representing a number of kin groups at different levels of kinship organization (Qinghai Institute 1990: 114–137, 140–141).

This cemetery included single- and multiple-interment (up to five) burials, as well as primary and secondary burials. Some tombs had grave goods, but no skeletal remains, suggesting that they were removed for secondary burials in other tombs, while the grave goods were left intact. Most tombs contained grave goods, mainly pottery vessels, stone tools, and personal ornaments, and the numbers of grave goods

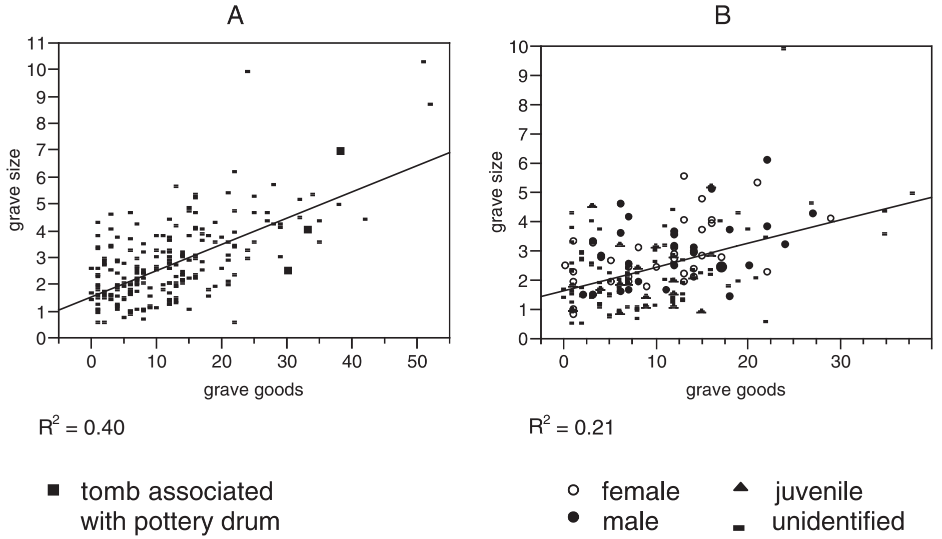


Figure 5.25 Bivariate plots showing the correlation between burial size and the number of grave goods from Yangshan in Qinghai, late Majiayao period. (A) Grave size by the number of grave goods for all burials; (B) distribution by gender and age for burials with 0–1 interment.

ranged from 0 to 52. The correlation between grave size and the number of grave goods is relatively strong ($R^2 = 0.40$) (Figure 5.25A), but this may be affected by the variety of burial methods, as multiple-interment burials tend to have more grave goods and larger tombs. In order to avoid possible distortion caused by different burial methods, I analyzed 184 burials which had 0–1 interment, assuming that each zero-interment tomb originally contained a skeleton before it was removed for secondary burial.

The results for the 0–1 interment burial data show that the grave sizes range from 0.49 to 9.86, with the CV of 0.52, and the numbers of grave goods vary from 0 to 38, with the CV of 0.75. The juvenile tombs had few grave goods, while female and male burials were similar in terms of quantity of grave goods present (Appendix 7.7). The correlation between the two variables for all burials is weak ($R^2 = 0.21$), suggesting a low level of burial variability (Figure 5.25B).

However, three tombs (M23, 60, 147) had relatively large numbers of grave goods in this cemetery (Figure 5.25A) and appear to have special characteristics. These three tombs all contained multiple skeletons that were interred as either primary or secondary burials (ranging from 2 to 4 individuals in each tomb), and contained artifacts which do not appear, or rarely appear, in other tombs. These artifacts include pottery drums (similar to Figure 5.5D), large stone axes, marble tubes, and a large number of marble beads. All primary burials in these three tombs were identified as adult males (Qinghai Institute 1990: 34–36, 143), with whom the pottery drums and large axes, probably representing prestige, may have been associated. The fact that the pottery drums only occurred in these three tombs suggests that the primary occupants of these tombs were religious figures of the community.

Notably, twelve round-shaped pits were found in the cemetery. Some of these pits contained animal bones, pottery sherds, or rocks of different sizes. In other pits, in addition to the pottery sherds, there were also traces of burning. Some pits held no material remains, suggesting that only perishable materials may have been deposited in them. Pottery sherds found in these pits are extremely fragmented and were probably broken up intentionally as a part of ritual performances (Qinghai Institute 1990: 53–56), as such a custom is known to have been a traditional mortuary ritual practice since prehistoric times in China (He Zheng 1994; Zhang Ying 1990). Most of the pits (ten out of twelve) were concentrated in the southwestern portion of the cemetery, and were also close to the two drum-bearing tombs (Figure 5.24). The pits are contemporary with the drum-bearing tombs (the late Banshan phase), or date from about two hundred years later than the cemetery. These data indicate that sacrificial offerings were specially made at the two drum-bearing tombs, and that ritual observances were continuously conducted from the time when the drum-bearing tombs were constructed, until a period after the cemetery ceased to be actively used as a burial site. This phenomenon is similar to that seen at Chengzi in Shandong, as discussed earlier.

It is conceivable that the individuals in the drum-bearing tombs, especially the two that were surrounded by sacrificial pits, were leaders of the community, both probably being politically and religiously powerful. This is the most likely reason why they were remembered and venerated as ancestors by their descendants. The Yangshan cemetery, therefore, represents a type of ancestral cult in which individuals, rather than groups, became the focus of the mortuary ritual. In addition it is evident that religious and political authorities are intertwined with ancestral cults. The burial patterns revealed at the Yangshan site do not, however, show the conspicuous hierarchical social system, as seen at the Dawenkou and Longshan burial sites discussed previously.

Huangniangniangtai: Huangniangniangtai, a Qijia culture site, is located in Wuwei, Gansu province (Figure 5.1). A total of 62 tombs were unearthed in the fourth season of excavation in 1975, including single-, double-, and triple-interment burials (Figure 5.26). A large quantity of jade/stone ritual objects, predominated by *bi* disks, was found at this site. 20 tombs were associated with more than 260 such ritual objects. Among the 10 double-interment burials, most had similar arrangements – one male placed in an extended position and one female in a flexed position facing the male. In all 3 triple-interment tombs, the male was situated in the middle while 2 females were placed on the sides facing the male. In these multiple-interment tombs, the grave goods were generally placed near the male occupants. The best-furnished tomb (M48), for example, contained an adult male in the center accompanied by 2 females on the sides (Figure 5.26). The burial was associated with 83 stone *bi* disks, 1 jade pendant, 304 small pieces of jade and stone waste material, and 10 pottery vessels (Gansu Museum 1978). All the *bi* disks were placed near the male skeleton (Figure 5.27). Tombs with similar features of a male buried with one or two females have been found in several Qijia culture cemeteries. This mortuary custom has been interpreted as evidence of women being sacrificed to their husbands

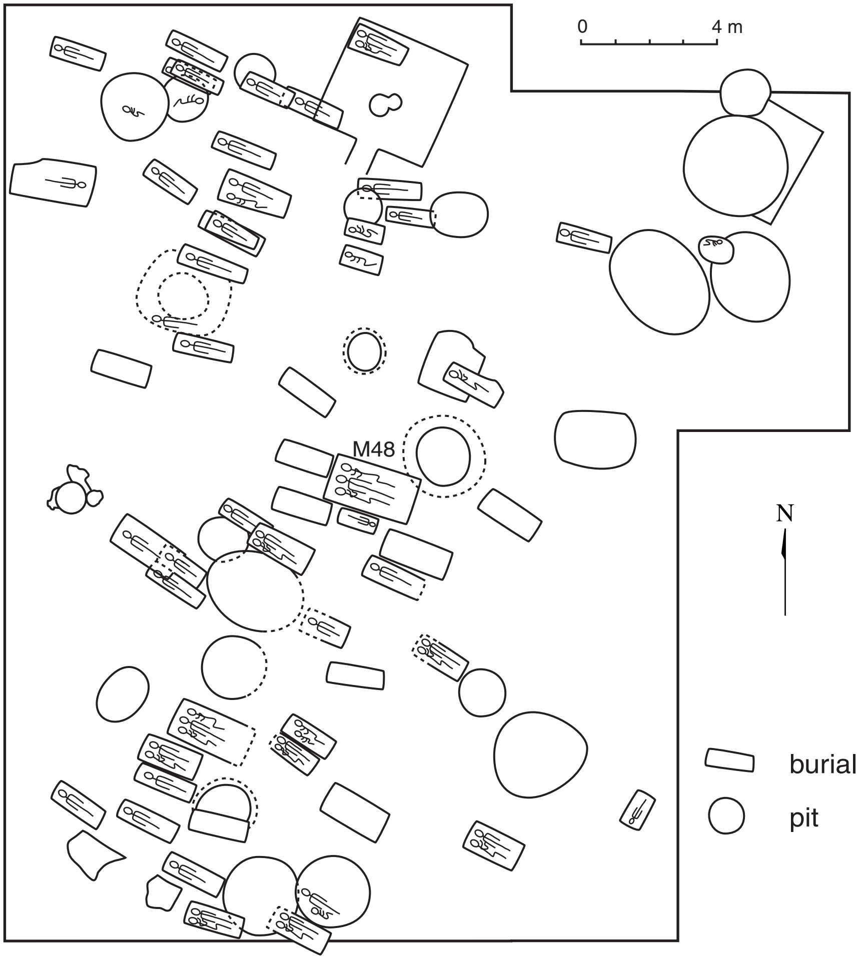


Figure 5.26 Distribution of burials at Huangniangniangtai in Wuwei, Gansu, Qijia culture (adapted from Gansu Museum 1978: fig. 3).

in a patriarchal society (Gansu Museum 1978), or as evidence of the practice of suttee (sati), which was widespread on the Eurasian steppe (Fitzgerald-Huber 1995: 38). However, some researchers have recently argued that a number of skeletons in these tombs were incomplete, suggesting that these were secondary burials for the members of families who died at different times (Ye 1997). However, it is clear that the men enjoyed higher social status than the women, as it was the latter who were usually placed in subordinate positions in these tombs.

The excavation report does not provide complete information about grave size and sex identification, therefore the variables used for statistics are not the same as those for other sites. The results of analysis show that the numbers of grave goods range from 1 to 94 (excluding jade/stone waste material), with a relatively high CV value of 1.34 (Appendix 7.8), suggesting great burial variability. There is a strong correlation between the total number of grave goods and the quantity of jade *bi* disks

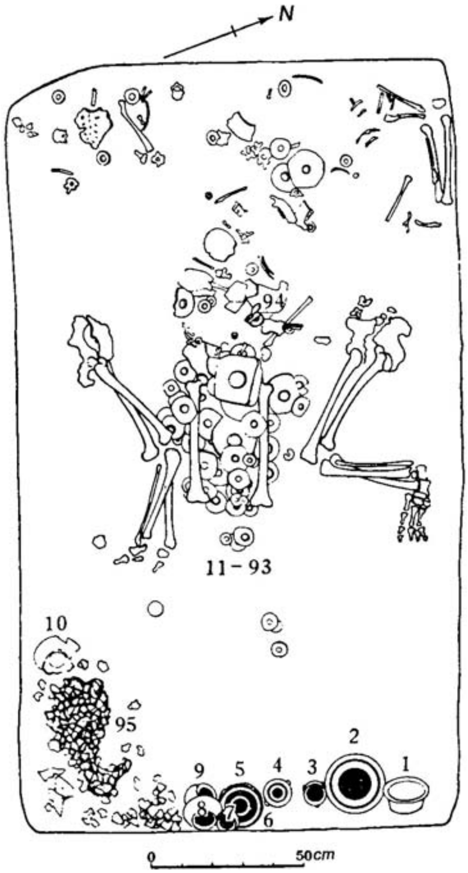


Figure 5.27 Burial M48 associated with jade/stone artifacts and waste material from Huangniangniangtai in Gansu, Qijia culture. 1–10: pottery vessels; 11–93: stone *bi* disks; 94: jade *huang* pendant; 95: stone waste material (adapted from Gansu Museum 1978: fig. 17).

in tombs ($R^2 = 0.78$), suggesting that the variability in grave goods is mostly affected by the presence of prestige goods (Figure 5.28). This situation is different from the Longgangsi cemetery of the Yangshao period where tools (bone awls) contributed to the variability of grave goods (Figure 5.12). Twenty tombs had jade/stone waste materials, and these tombs were generally rich in grave goods (Figure 5.28A). The occupants of these tombs, who had close associations with jade manufacture, may have had high social status in general. Juvenile tombs were simpler with no presence of the jade/stone *bi* disk or waste material (Appendix 7.8; Figure 5.28B).

More than ten Qijia culture sites have jade artifacts, but only two sites, Huangniangniangtai and Haizang Park, have jade waste material. Haizang Park, also in Wuwei, was a jade/stone manufacturing site, as indicated by a large quantity of jade/stone waste material and semi-finished products. These two sites are only 1.5 km apart from each other, and may have been used by the same community that specialized in stone and jade manufacture. The stone ritual items from Qijia culture sites are mostly made of marble which was perhaps derived from local sources, but the jade materials from the Haizang Park are a variety of colors, and some of them

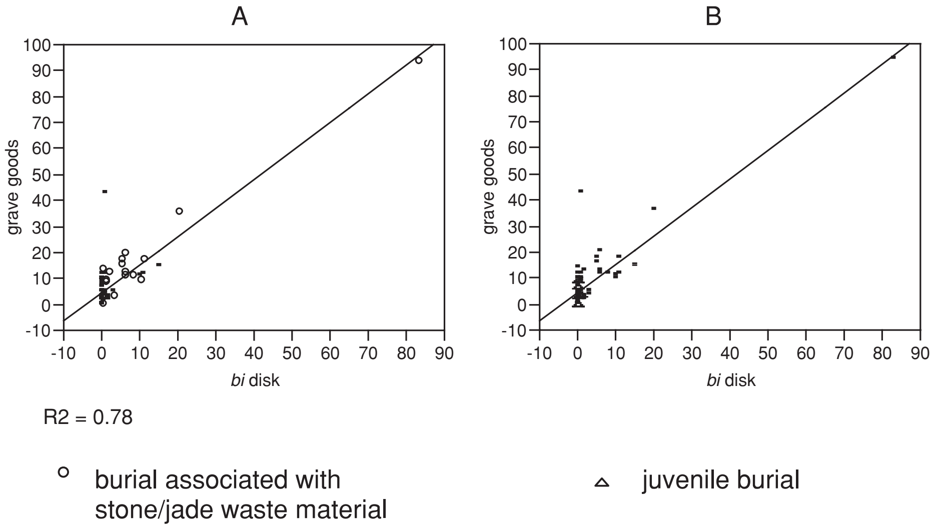


Figure 5.28 Bivariate plots showing the correlation between the number of grave goods and the number of jade/stone *bi* disks at Huangniangniangtai in Gansu, Qijia culture; (A) distribution of jade/stone waste material in all burials; (B) distribution of juvenile burials.

may have come from places located further west in Hetian, Xinjiang (Liang and Liu 1993; Ye 1997).

The Huangniangniangtai cemetery is one example of elite individuals who were involved in the manufacture of ritual goods, suggesting that there was an alternative strategy to obtain power (Liu, L. 2003a). Gender differentiation at Huangniangniangtai is pronounced, suggesting that men dominated jade manufacture and, by controlling the production of such prestige items, these elite craftsmen gained high social status.

Summary: The two sites from the upper Yellow River region reveal a transition from relatively egalitarian to stratified societies, as well as marked changes in many aspects of society. Yangshan represents a community in which social differentiation was minimal, although some individuals were able to obtain high social status by controlling ritual power. It should be noted that the ritual paraphernalia (pottery drums) appear to have been made locally, judged by their decorative style, and that minimal effort would have been required to produce them. However, Huangniangniangtai demonstrates the opposite – here was a society in which social differentiation was well established, and its elite may have created and maintained high social status by controlling the production of labor-intensive ritual goods, some with exotic origins – such as jade/stone ritual objects.

Discussion

Social hierarchy in kin-based societies

The case studies presented above demonstrate that mortuary variability existed in all communities, including egalitarian ones. However, degrees of variability varied in different societies cross-regionally. Such variability is observable in the results from quantitative analyses of burial data, summarized in Table 5.1.

Table 5.1 *Cross-cultural comparison of burial variability from Neolithic and early Bronze Age sites*

	Group I Peiligang, Yangshao & Majiayao cultures (ca. 7000–2300 BC)				Group II Dawenkou, Longshan, Qijia, & Upper Xiajiadian cultures (ca. 4000–500 BC)				
Site	JH	SQ	LGS	YS	DWK	YCS	CZ	HNT	UXJD
CV for grave size (m^2) – all burials	0.52	0.67	0.51	0.52	0.69	0.75	0.77		
CV for no. of grave goods – all burials	0.12	0.78	0.89	0.75	1.36	1.63	2.21	1.34	1.95
Correlation (R^2) – all burials	0.15	0.21	0.17	0.21	0.48	0.39	0.58		
CV for no. of grave goods – juvenile	0.88		0.73	0.52	1.96	0.94	1.56	0.95	
CV for no. of grave goods – female	1.18		0.77	0.65	1.34	1.35	1.98		
CV for no. of grave goods – male	0.99		0.78	0.59	1.32	2.15	1.73		

JH: Jiahu; SQ: Shuiquan; LGS: Longgangsi; YS: Yangshan; DWK: Dawenkou; YCS: Yuchisi; CZ: Chengzi; HNT: Huangniangniangtai; UXJD: Upper Xiajiadian.

The burial sites analyzed above can be classified into two groups, based on the CV value for the number of grave goods, and R^2 value for the correlation between grave size and the number of grave goods. The sites from Group I (Jiahu, Shuiquan, Longgangsi and Yangshan) have minimal variability in grave goods (CV < 0.9) and weak correlation between grave size and number of grave goods ($R^2 = 0.21$ or less). The sites from Group II (Dawenkou, Yuchisi, Chengzi, and Huangniangniangtai) have greater variability in grave goods (CV > 1.3) and stronger correlation between grave size and the number of grave goods ($R^2 = 0.39$ or more) (Table 5.1). The implications of these general statistics also match more detailed observations on the quality of grave furnishings, in that the cemeteries in Group II tend to show a stronger correlation between large burials and prestige goods or status markers (e.g., jade, fine pottery, pig heads, and ritual goods). Based on the characteristics of the material remains, Group I represents societies that were relatively egalitarian in nature, and Group II manifests clear evidence of stratified societies. Interestingly, an analysis of the number of grave goods from eighty-one burials in several sites dated to the Upper Xiajiadian culture (a stratified society in Bronze Age northeast China) by Shelach (2001) provides a comparable example. This assemblage has a CV value of 1.95 (Shelach 2001: 65), which falls into the range of Group II in Table 5.1. It is premature to propose a general model for measuring degrees of burial hierarchy in Neolithic China based on current statistic analyses, due to the small sample size in this study. But it would be interesting to test the results presented here with larger sample sizes in the future.

The CV values for grave size show minor differences among the sites examined in this study (Table 5.1). This may indicate that grave size was not as sensitive to social status as to other variables in the Neolithic period, but it may also be because grave size was in some cases affected by methods of interment (e.g., primary and secondary burial), rather than by social status.

In all the site examples, the quantity and quality of grave goods are more favorable to males, even in those societies appearing to be egalitarian in nature. In most cases, the best-furnished tomb in each cemetery belonged to an adult male. Although there are some exceptions, such as at Sanlihe, there was a general increase in the male-domination of most Neolithic societies.

In all cases juvenile burials are more sparsely furnished than adult ones, and this is especially true in the examples from egalitarian societies (CV ≤ 0.88). But the variability within each burial site increased in stratified societies (CV ≥ 0.94) (Table 5.1). The facts, that some juvenile burials received high-ranking treatment at Dawenkou and Chengzi and that the largest multi-generational burials are found concentrated in one section of the cemetery at Dawenkou, Taosi, and Chengzi, suggest that social status may have been ascribed in some places during the early Dawenkou period, and that this phenomenon then became much more widespread during the Longshan period. These considerations imply that hereditary status formed a crucial part of social stratification.

Burials of kin, whether of high or low status, often appear in closely clustered graves in one section of a cemetery. As burial stratification developed, tombs of high-ranking kin groups became spatially separated from those of low-ranking groups in the same cemetery; evidence from Dawenkou culture marks the beginning of this tradition. Such a family/lineage oriented spatial pattern of burials is different from other contemporary burial sites of the Liangzhu culture in the Lower Yangtze River valley, where only elite graves were found in platform mounds (e.g., Fanshan Archaeology Team 1988; Zhejiang Institute 1988). The Neolithic burial patterns derived from the Yellow River region also differ from some prestate cultures in North America (e.g., Peebles 1971) and Mesoamerica (e.g., Merry de Morales 1987), where elite individuals were buried in a separate location, near the ritual center and distant from ordinary residential areas where the commoners were usually buried. The case studies I have described demonstrate a tradition which emphasized kin-solidarity. Although social differentiation developed within kin groups, and a number of kin groups may have competed for prestige and social status, it did not lead to the dissolution of, but instead became integrated with, existing kinship-oriented social systems.

Large public buildings have been found at several Neolithic sites (see chapter 4), but none of them can be identified as an ancestral temple. It is possible that ancestral cults were practiced in cemeteries or in residential houses before the Three Dynasties, when there is evidence for the construction of ancestral temples. The tradition of gravesite ritual may be traced back to the Peiligang culture, and tombs were still regarded as the ancestral cult's center even after temples began to play an important religious role during the Shang dynasty (Wu, H. 1988). Given the likelihood of cultural continuity between the Neolithic and Shang period, the late Neolithic burial patterns discussed previously probably represent an ancient tradition with a strong emphasis on kinship relations.

Burial data presented above by no means suggest an across-region, unilineal model of mortuary practice in Neolithic China. The evidence does indicate, however, that the development of burial hierarchy was closely related to the change in practice of ancestral cults. There may have been different forms of ritual practice directed at ancestors during Neolithic times. Perhaps implying both temporal change and regional variability, these ritual forms differ in three respects, as follows. (1) Venerated ancestors vary from collective groups to individuals with high social status. (2) People who performed rituals changed from large social organizations at the community level (probably represented by multi-lineage groups) to small social groups at lineage or family levels. (3) Social beneficiaries of the ritual changed from the entire community to selected social sectors of the whole, mainly lineages or families with high social status. Two basic forms, therefore, characterize ancestral rituals in ancient China: "group-ancestral cults" and "individual-ancestral cults" (Liu, L. 2000a). The former was, generally, associated with a relatively egalitarian social organization, and the latter, which became well developed in the late Neolithic period in some regions, was closely related to the formation of stratified societies. There is no clear distinction between these two sets of categories, and a number of variations on them may have also existed. The Yangshan cemetery, for example, demonstrates that some individuals may have achieved high social status and received special posthumous veneration in an egalitarian society.

The occurrence of ancestral cults focused on select individuals indicates unequal access to deities, who were ancestors of some families or lineages enjoying higher social rank. In turn, only those families or lineages could receive blessings from deified ancestors. Therefore, the practice of such ancestral cults during the Neolithic period provided a religious basis for, and was reinforced by, the establishment and development of social stratification.

Ritual paraphernalia and ritual power

Burials associated with ritual paraphernalia (flutes and turtle shells) at the Jiahu site suggest that even in an egalitarian society some individuals with ritual power may have played special roles in the community. However, the ritual items from Jiahu burials were not labor-intensive artifacts, although they required special skills to make them (such as bone flutes), and the raw materials for them were probably available locally.

Another example, in which individuals received special treatment in mortuary rituals, is revealed in a Yangshao culture burial at Xishuipo in Puyang (Figure 5.1), Henan. In Burial M45 at this site, an adult male (1.8 m tall) was buried with large-scale features that were made from shells and are identified as images of dragon, tiger, and deer. The man is believed to have been a *wu* shaman, and animal images are interpreted as the animal helpers which assisted the shaman to communicate with the supernatural world (Chang 1988; Puyang Cultural Relics 1988). The burial M45 at Xishuipo, however, did not contain any personal wealth or items representing economic privilege.

These individuals buried in the Jiahu tombs with ritual items, and the individual in Xishipo M45, therefore, may have been religious leaders who had achieved social status through their ritual power, and were respected by their communities within these egalitarian societies.

Similarly, in the Yangshan cemetery in Qinghai, the relationship between religious power and high social status is evident. There is a clear association between the few elite burials with ritual paraphernalia (pottery drums) and remains of ancestral ritual (sacrificial pits), suggesting that ancestral cults were directed toward these high-status individuals. However, the ritual paraphernalia were made with locally available material and techniques, and there is no evidence for economic inequality among the members of the community.

In contrast to the above examples, the Dawenkou and Longshan cemeteries exhibit marked changes in ritual practice. In the Longshan cemeteries, particularly, there is a close association between highly ranked individuals, ancestral cults, status markers, wealth, and ritual paraphernalia made by labor-intensive techniques or obtained from long-distance trade. These associations suggest that when ancestral rituals focused on families or individuals with high social status, religious leaders may have become the most deified ancestors in some societies.

Regional and inter-regional exchange of prestige goods, including ritual paraphernalia, is common elite behavior in many prestate societies worldwide. Prestige items were employed in ceremonial exchanges that cemented alliances between the leaders of different groups, and were used to attract and establish personal clientage relationships with the headmen of smaller or lesser-ranked groups (Hirth 1992: 28). The regional and inter-regional distribution of ritual objects reflects, in part, the effort by various elites to form local, regional, and inter-regional power structures. At the same time the elites sought to acquire exotic and valuable goods in order to distinguish themselves hierarchically from local commoners.

This model may partially explain the cross-regional distribution of some ritual objects in late Neolithic China. At Chengzi and Taosi, for example, the small number of burials which contained traded items (jades, egg-shell pottery, and alligator drums) were associated with those grave goods and burial features that indicate high social status (pig mandibles, the *ercengtai* ledge, and wooden chamber or coffin). These burials, belonging to elite groups, are clearly distinguishable from the ordinary burials. The fact that egg-shell pottery goblets were widely distributed in the Shandong region, that some Shandong goblets may have been exchanged for Liaodong jade products, and that alligator drums (or skins) were transported to areas (e.g., Taosi in Shanxi) far away from the alligator's natural habitat, also suggest that long-distance exchange of ritual objects was an important political strategy employed by elites to develop regional and inter-regional political relationships (Liu, L. 1996a). The distribution of these ritual objects seems to indicate that the long-distance exchange of elite goods was an important component in the formation of social hierarchy in the late Neolithic period.

Egg-shell pottery vanished at the end of the Longshan culture. Its disappearance may have occurred as a consequence of the decline of the Longshan elite social system in the Shandong region. Egg-shell pottery goblets were probably made by a small number of potters who were affiliated with particular elite groups, and the goblets may have been circulated both to symbolize high status and to establish political alliances. When the elite network declined, the potters presumably were no longer required to produce such technically difficult and therefore costly objects. As a result, this symbol of status, which had supported the integration of the regional elite social system, disappeared.

The trans-regional distribution of certain forms of prestige goods may also be related to the control of ritual power by religious practitioners. There are two general paths through which ancient religious practitioners might obtain and signify their ritual power. One path is through the vertical dimension of ritual communication, by which ritual practitioners reached supernatural beings in another world with spiritual techniques (such as going into trance). The other path is through the horizontal dimension of communication, in which they physically traveled to distant locales to obtain cosmological knowledge and ritual techniques (Helms 1992b: 320). This travel by ritual practitioners may have been a principal medium both of shared ritual knowledge and of the trans-regional spread of ritual paraphernalia and symbolic art forms. The recurrence of jade forms and decorative motifs in distant communities in Neolithic China may indicate that the shared belief systems and ritual actions of elites were the results of such horizontal ritual communication (Liu, L. 2003a).

An important aspect of controlling ritual power is the production of ritual goods. In many cultures in the world, elites were involved in the manufacture of prestige goods (Costin and Wright 1998). This is especially true in the case of those chiefdoms or middle-range societies where ritual knowledge and performance were a crucial part of achieving and maintaining status (Spielmann 1998). Similarly, elites in some communities in Neolithic China were likely to have personally participated in the production of jades, as indicated by elite burials at several Neolithic sites which yielded jade waste material, semi-finished products, and manufacturing tools. These sites are all distributed in the areas where jades were used as status markers in mortuary contexts (Liu, L. 2003a). Evidence at the Huangniangniangtai cemetery demonstrates that some high-status individuals were associated with the manufacture of jade/stone ritual objects.

It is important to note that there was no single source from which all symbolic representations were derived in Neolithic China. There seems to be no horizon of artistic styles at a trans-regional level, similar to the Olmec and Chavin horizons in the New World (Willey 1962). In Neolithic China cosmological power was not centralized; instead, there were many regional centers which may have contributed to the formation of various belief systems, and the few shared jade forms and decorative motifs may have resulted from diffusion, borrowing, and amalgamations between regional belief systems. This regionalized pattern in the production and distribution of prestige items is consistent with the regionally centralized forms of political system, which will be discussed in the next chapter.

Conclusion

By investigating burial remains in three regions along the Yellow River valley, we can see that there are some significant regional differences in mortuary practice. The earliest development of burial stratification was on the east coast region, and was associated with individual-oriented ancestral cults. People expressed their social differentiation through elaborate mortuary rituals, which may have in turn stimulated and enhanced hierarchical social systems. The Central Plains region developed a strong tradition of group-oriented ancestral rituals, and social energy was more focused on constructing public monumental architecture (public buildings and rammed-earth walls) than on elite burials, with the exception of the Taosi region. The upper Yellow River valley exhibited distinct burial patterns in gender hierarchy, and in control of the production of ritual goods by the elite.

Although developmental trajectories varied regionally, in many late Neolithic communities mortuary practices shared some of the general characteristics. This trend was manifested by increased differentiation of social status, gender, and wealth in burials. Social stratification was ideologically legitimized by ritual activities that emphasized ancestral cults. Some religious practitioners may have become deified ancestors who posthumously received sacrificial offerings from the descendant group. The elite's direct involvement in the manufacture of prestige ritual goods ensured their control of the material sources of ritual power. Furthermore, social interactions were politically strengthened by elite networks of exchange for high-status goods at both regional and inter-regional levels. All these changes took place within kinship-based communities, and social hierarchy and kinship relations were intertwined.

The emergence of high social-status ritual practitioners who gained religious power in the late Neolithic seems to support the legend, from *Guyu*, which refers to "severance of heaven–earth communication," cited at the beginning of this chapter.

As mentioned previously, most of the mortuary data used in this chapter are derived from selected regions where elaborate burials have been discovered, but rich burials are absent from the archaeological record in Henan and Shaanxi. We cannot rule out the possibility that some large Longshan burials in Henan and Shaanxi may have been destroyed in the past, or that archaeologists have not yet located them. However, it is also possible that there were regional variations in mortuary practice, which may have been associated with the particular social systems that developed in different areas. Mortuary variability was closely related to variety in settlement patterns at both community and regional levels, and to different trajectories of social complexity in Neolithic China. This theme will be explored further in the following chapters that discuss regional settlement patterns.

6

Development and decline of complex societies in the Central Plains

> During the reign of Yu, there were ten thousand states under heaven.
>
> "Yongmenpian" in *Lüshi Chunqiu*, a text written about 239 BC

Introduction

If a complex society, such as a chiefdom, is characterized as a polity that centrally organizes a regional population (Carneiro 1981; Earle 1987; 1991b: 1), the reconstruction of its regional social systems is crucial to our understanding of the social and political organization of that chiefdom. Such reconstruction is best achieved by studying regional settlement patterns (Drennan and Uribe 1987: 60).

Settlement patterns are concerned with the distribution of different types and sizes of sites over the landscape, and so provide important information about the organizational complexity of a society. Complex societies manifest an increased range of settlement types, as defined by their function and size. While the majority of settlements are small villages, a few places will emerge as local administrative centers which play integrating roles. As complexity increases, central places become ranked (e.g., Johnson 1977; Steponaitis 1981). The primary center may also be a highest-order central place for many reasons, such as economic, cultural, ritual, or administrative factors. Second-order central places might also function as local centers for the transfer of goods and services up from lower-order centers and, reciprocally, down to the mass of population in the hinterland (e.g., Kipp and Schortman 1989). The range of community types (by variation in function), and the sizes and numbers of each type in a settlement system can be used to determine degrees of socio-political integration in the region (Johnson 1977).

In order to understand various trajectories toward social complexity in different regions, this chapter focuses on settlement patterns in the Central Plains (Henan and southern Shaanxi),[7] where complex societies eventually evolved into the first states. Chapter 7 will discuss development of other regions in the east and west, outside the Central Plains.

Methods

Two strategies are commonly used to interpret the socio-political implications of regional settlement data and to evaluate degrees of social complexity. The first strategy is to analyze the relationship between the administrative (or decision-making)

Table 6.1 *Generalized correlation among four variables for measuring social complexity*

Social organization	Tiers of settlement hierarchy	Levels of administrative hierarchy	Population size (persons)*
Simple chiefdom	2	1	Low thousands
Complex chiefdom	3	2	Tens of thousands
State	4	3	10,000–100,000 or more

* Estimated population sizes for simple and complex chiefdoms are based on Earle (1991b: 3), and for state is based on Feinman's summary (1998: 97–98).

hierarchy and the settlement hierarchy. The number of administrative levels, as a factor that frequently corresponds to the degree of social complexity, may be revealed by analysis of settlement hierarchy, based on the distinction between centers and villages, and may be assessed according to the size of the settlement and its particular symbolic features. An increase in the number of levels of settlement hierarchy can also be correlated with growth in population density (Earle 1991b: 3; Peebles and Kus 1977; Wright 1977: 389; 1984: 42, 53). A study of ethnographic information on political complexity in Sub-Saharan Africa is an example which clearly demonstrates the correlation between social organizations and settlement patterns (Taylor 1975). Based on settlement data, a general correlation among the four variables (social organization, tiers of settlement hierarchy, levels of administrative hierarchy, and population size) has been proposed by several scholars (Earle 1991b: 3; Feinman 1998; Johnson 1973: 4–12; Wright 1977: 389), and is summarized in Table 6.1. This approach has been employed in many areas in the world, and has proven to be of significant value (Flannery 1998). In this study, I follow the common practice in defining settlement hierarchy, as based on natural breaks shown in histograms of settlement-size distribution.

The population size of a polity is an important variable with which to measure the level of complexity of a given society, but there is no single formula for estimating population density in prehistory, and relationships between population sizes and social organizations vary significantly in time and place (Feinman 1998: 97–99). Due to a lack of demographic data from Neolithic China, I will use an estimated catchment area for each central place with its associated settlements as the indicator of regional population size.

The other strategy used in the analysis of social complexity is the rank-size variation. This is a revised interpretation of the so-called "Rank-Size Rule" in economic geography. The basic form of rank-size distribution, as observed in many different settlement systems, can be defined according to the following formula: a settlement of rank *r* in the descending array of settlement sizes has a size equal to the size of the largest settlement in the system divided by the rank, *r*. Rank-size distribution can also be illustrated in common logarithms and the result is a straight line called the "log-normal line." This Rank-Size Rule, described by George Zipf (1949), is the manifestation of a balance between two contradictory economic forces – diversification and unification.

Analysis of rank-size distribution has been used in many archaeological studies of regional settlement patterns (e.g., Adams and Jones 1981; Blanton *et al.* 1982; Falconer and Savage 1995; Hodder 1979; Johnson 1980, 1981, 1987; Pearson 1980; Wright 1986). Several types of deviation from rank-size linearity have been observed in archaeological data, among which two are the most recurrent: (1) primate (or concave), in which the largest settlement in the system is larger than predicted by the rank-size rule; and (2) convex, in which the largest settlement is smaller than the rule would predict.

Different rank-size distributions have been regarded as reflections of different systems of social integration. For instance, the rank-size distribution of highly integrated settlement systems is expected to approach log-normality. Accordingly, systems with relatively low degrees of integration should exhibit very convex rank-size distributions, while primate distributions may have been characteristic of systems in which economic competition is minimized and/or system boundary maintenance is the major function of the primate center (Johnson 1981, 1987: 108–9).

The application of the rank-size model to archaeological data has provided interesting results for studies on the development of complex societies. For example, Johnson (1981) has demonstrated rank-size change on the Susiana plain in Southwestern Iran during three periods (3800 BC, 3600 BC, and 3400 BC), each of which experienced marked changes in local political organization, including the development of the first state-level society in that area (3400 BC). These rank-size distributions showed a clear trend, developing from convexity to near log-normality. Thus, these two strategies or approaches, of settlement hierarchy and rank-size analysis, are employed in this study. They provide empirical methods for measuring the degree of social complexity and for assessing the nature of settlement systems.

Data

This analysis concentrates on sites in the middle Yellow River valley, including southern Shanxi and Henan provinces, the region traditionally regarded as the heartland of Chinese civilization. The settlement data used in this study are derived from two classes of surveys: traditional and systematic. Traditional surveys have been carried out by Chinese archaeologists over the past fifty years across an area of 8,000 km^2 in southern Shanxi (Dingcun Culture Team 1986; Gao Tianlin *et al.* 1984; Shanxi Team 1989; Zhang and Gao 1987), and throughout an area of 167,000 km^2 in Henan province (National Bureau 1991; Zhao Chunqing 2001). Traditional surveys in China are primarily aimed at planning further excavations, defining the distribution of archaeological cultures, and understanding the relationship between material culture and geographic environment. A special category of traditional survey includes those done in cooperation with construction projects, which are becoming more frequent in China. Based on archaeologists' past experience, textual records, and information from locals, traditional surveys cover areas believed to have been inhabited in ancient times, with a focus on locating good sites for further investigation

(Shi Xingbang 1982: 3–8). A recent study of settlement patterns by Zhao Chunqing (2001) has re-examined many of the large Neolithic sites discovered previously in Zhengzhou and Luoyang areas in Henan, and has provided more recent estimates of site size.

These surveys have employed strategies which are biased in the selection of areas covered, so their results suffer from two major deficiencies. First, many sites, either small ones or those located in areas thought unlikely to have been inhabited, may have been overlooked. Second, measurement of the size of each cultural occupation at multi-component sites was rarely attempted, and many reports provide only rough chronological intervals, such as archaeological cultures spanning periods of time ranging from a few hundred years (e.g., the Erlitou culture) to two thousand years (e.g., the Yangshao culture). Therefore it is impossible, in many cases, to conduct more elaborate analyses on site distribution. In order to avoid overlooking the large settlements in these multi-component sites, site-size distributions for single-component and multi-component sites are shown separately in histograms. The analysis of site hierarchy is mainly based on the site-size distribution of the single-component sites, but, where necessary, the large multi-component sites are also considered.

The second source of settlement data is the result of several systematic and/or full-coverage surveys, recently carried out in Shandong and Henan (Liu, L. and Chen 2001c). These projects are specifically designed to reveal long-term social changes at the regional level, and have dramatically increased our understanding of settlement patterns in the region. However, the systematic surveys covered fairly small areas. The bulk of existing data used here, therefore, still derives from the traditional survey reports. It will be possible to test the analytical model proposed in this study in the future when more data from systematic surveys become available.

Because of these major limitations on the available data, multiple variables, including rank-size curves, site-size hierarchy, site distribution, and site function, are all taken into consideration in a synthetic analysis. Used in this way, the traditional survey data still provide useful information.

Regional settlement patterns

In the following pages, I will discuss changing settlement patterns during the entire Neolithic period, which demonstrate marked variability in time and space.

Early Neolithic period: the Peiligang culture

In Henan and southern Shanxi, the Peiligang culture (ca. 7000–5000 BC) developed at the beginning of the Holocene climatic optimum. More than seventy sites were found in Henan before the 1990s (National Bureau 1991), mostly distributed across the Huang-Huai Plains, where climatic conditions were probably better than in other areas with which we are concerned (Figure 6.1). These sites range from less than 1 to 6 ha in size, and their rank-size analysis shows a strong convex curve (Figure 6.2A). As was discussed in previous chapters, although some ritual practitioners may have enjoyed more prestige than most people in the community, the Peiligang culture

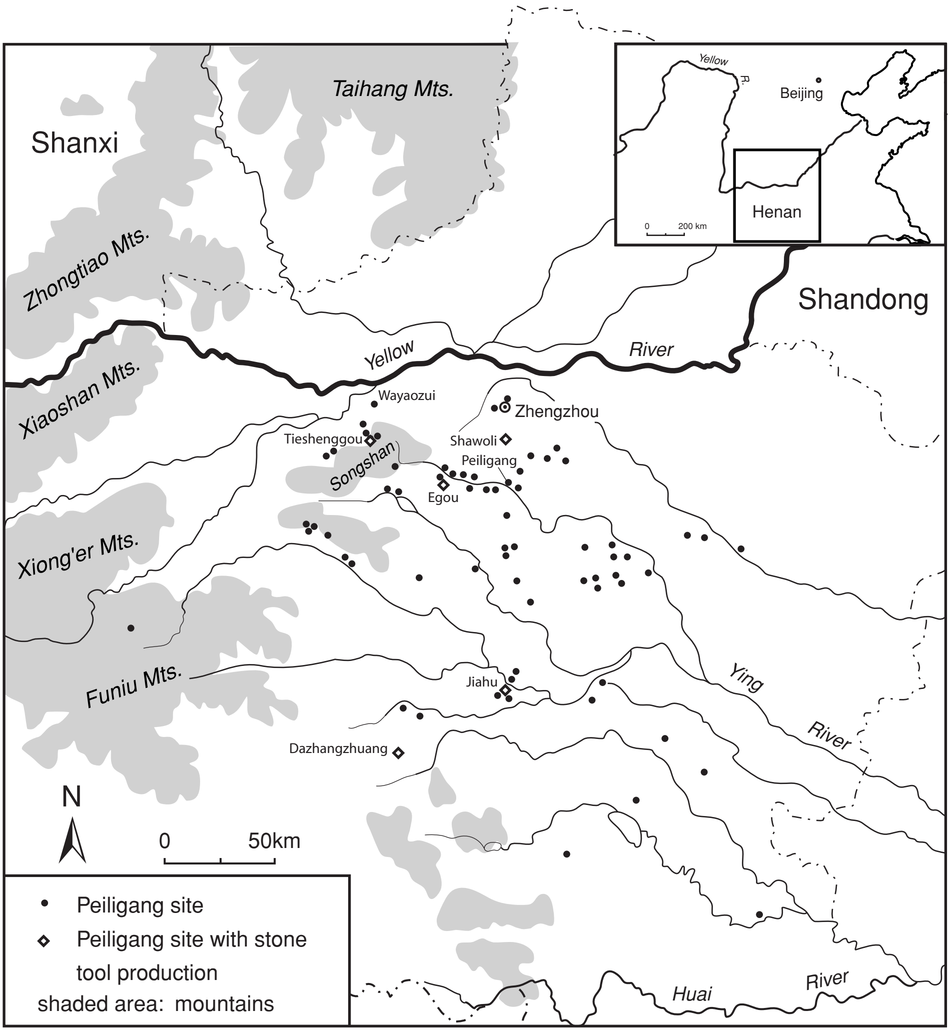


Figure 6.1 Distribution of Peiligang sites in Henan.

was, in general, an egalitarian society. No settlement hierarchy may be observed, and the convex rank-size curve suggests a settlement system with little political integration.

Middle Neolithic period: the Yangshao culture

The Yangshao period (ca. 5000–3000 BC) roughly coincided with the warmest and most humid phase during the Holocene optimum (7,200–6,000 BP) (Shi, Y. *et al.* 1993), which was driven by the intensified East Asian monsoon (Yi *et al.* 2003). These conditions resulted in an increase in areas covered by water (rivers, marshes, and lakes) in lowland regions (An Z. *et al.* 2000: 747; Cao Bingwu 1994; Man 1992). Thus much of the lowlands of the Central Plains were probably covered by

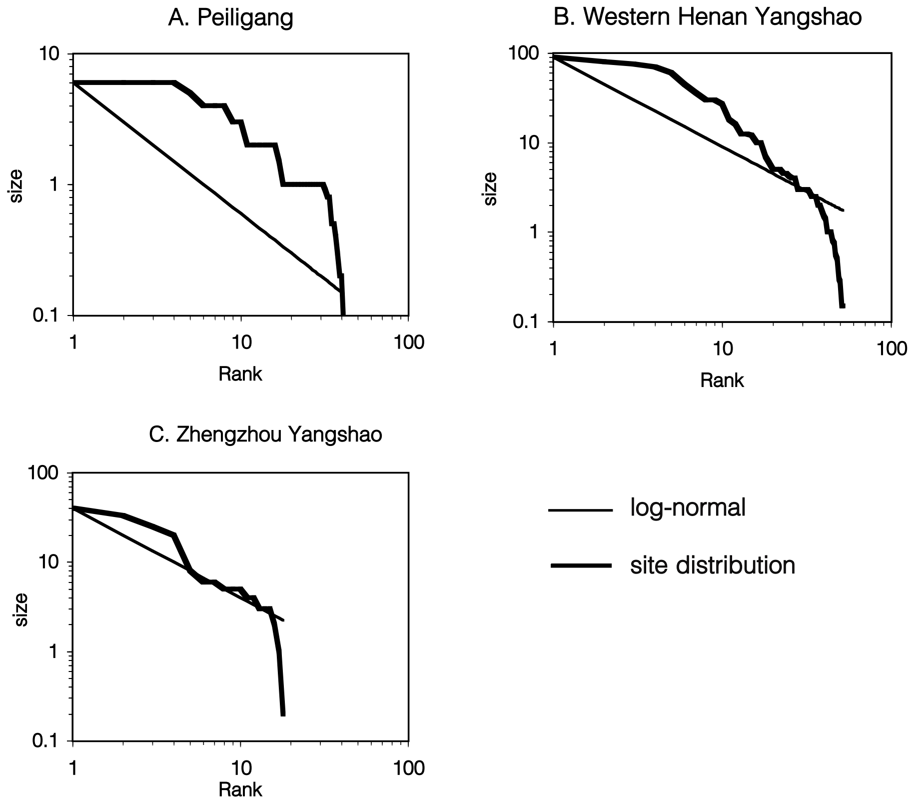


Figure 6.2 Comparison of rank-size distributions from (A) Peiligang, (B) Western Henan Yangshao, and (C) Zhengzhou Yangshao sites, all showing convex curves.

water. The Yangshao culture developed at a large number of sites. In Henan some 800 Yangshao sites were found prior to the 1990s, a figure more than ten times greater than the number of sites found belonging to the Peiligang culture (National Bureau 1991). However, Yangshao sites in the lowlands are small and scattered, and tend to be located on relatively high ground (Cao Bingwu 1994: 64). In contrast, on the highlands, and on the transitional regions between highlands and lowlands, Yangshao culture flourished as indicated by the dense distribution of sites (Figure 6.3). Two regions, one in western Henan, and the other in the area of Zhengzhou, experienced the most rapid increase in site size and numbers.

The Western Henan region refers to an area of loess terraces between the Yellow River and the Xiaoshan Mountains, part of the Lingbao, Shanxian, and Sanmenxia counties today. More than ninety Yangshao sites have been found there, the majority of which date to the Miaodigou phase (ca. 4000–3500 BC) (Henan Institute and Institute of Archaeology 1999; National Bureau 1991: 166–189). The histogram shows a three-tiered settlement hierarchy (Figure 6.4A). The distribution of these sites indicates that six major centers (45 to 90 ha) were located on separate river courses, with distances between centers ranging from 14 to 25 km, with an average

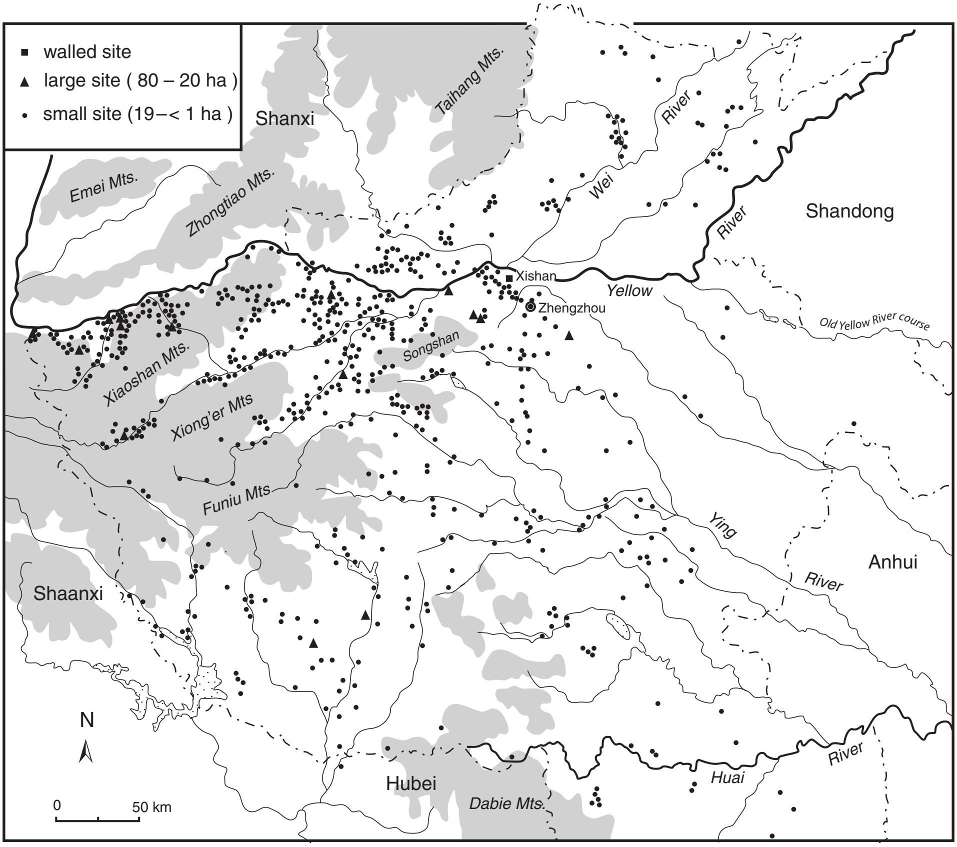


Figure 6.3 Distribution of Yangshao sites in Henan (adapted from National Bureau 1991: maps 32–33).

of 20 km. If each major center was the central place of an autonomous social system, such systems were rather small, with an average catchment area of 314 km^2 (Appendix 8.1).

Two major centers (Beiyangping and Wudicun) were clustered with secondary centers (27 to 36 ha) and villages (18 ha and smaller), forming three-tiered site hierarchies. Other major centers, however, were associated only with village sites. It should be noted that the Sha and Yangping River valleys have been intensively surveyed in recent years (Henan Institute and Institute of Archaeology 1999; Institute of Archaeology 1999a), and the sites along these two rivers on the map all date to the Miaodigou phase. However, the sites in other river valleys were roughly dated to the Yangshao period by previous traditional surveys (Figure 6.5).

The Lingbao region appears to have been the most complex settlement system during the mid-Yangshao period. The regional settlement patterns, with two to three levels of settlement hierarchy, suggest the existence of chiefdom-level social organizations. The rank-size distribution shows a convex curve (Figure 6.2B), suggesting a decentralized or competing social system. Beiyangping and one of its secondary centers at Xipo were recently excavated. At both sites there was evidence of intensive

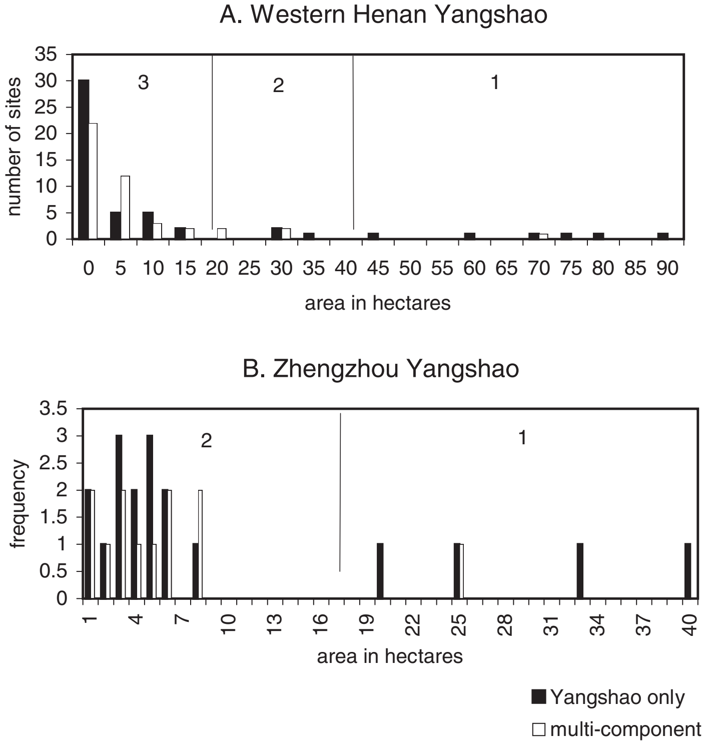


Figure 6.4 Histograms showing (A) three levels of settlement hierarchy in the western Henan region, mid-Yangshao period; (B) two levels of settlement hierarchy in the Zhengzhou region, Yangshao period.

farming and pig husbandry (Henan 1st Team 2001a, b; Henan Institute 2002a, 2003). Some high-status households appear to have had access to a valuable ritual substance (cinnabar), and to have held feasts involving the consumption of a large number of pigs (Ma 2003). This information suggests the elite families/groups may have practiced competitive emulation by giving ritual feasts and controlling valuables, in order to obtain prestige in the community and the region (see chapter 4). This aggrandizing strategy characterizes transegalitarian societies with an emergent social hierarchy (for a summary see Hayden 2001b). It is possible therefore, that Western Henan experienced the earliest development of Neolithic complex societies in the middle Yellow River valley (Ma 2003).

The Zhengzhou region, including Zhengzhou and Xingyang, is a zone where the western hilly region (300 to 800 m in altitude) and the eastern Huang-Huai Plains (< 150 m in altitude) meet. About thirty Yangshao sites have been found, and the histogram indicates a two-tiered settlement hierarchy (Figure 6.4B). These include five sub-regional centers (including one possible center), ranging from 20 to 40 ha in area, and more than twenty villages (10 ha or less) (National Bureau 1991; Zhengzhou Institute 2001) (Figure 6.6). The distances between centers range from 13 to 20 km, with an average of 17 km. Since Yangshao sites are few in number, with large areas of buffer zones between site clusters, catchment areas appear to

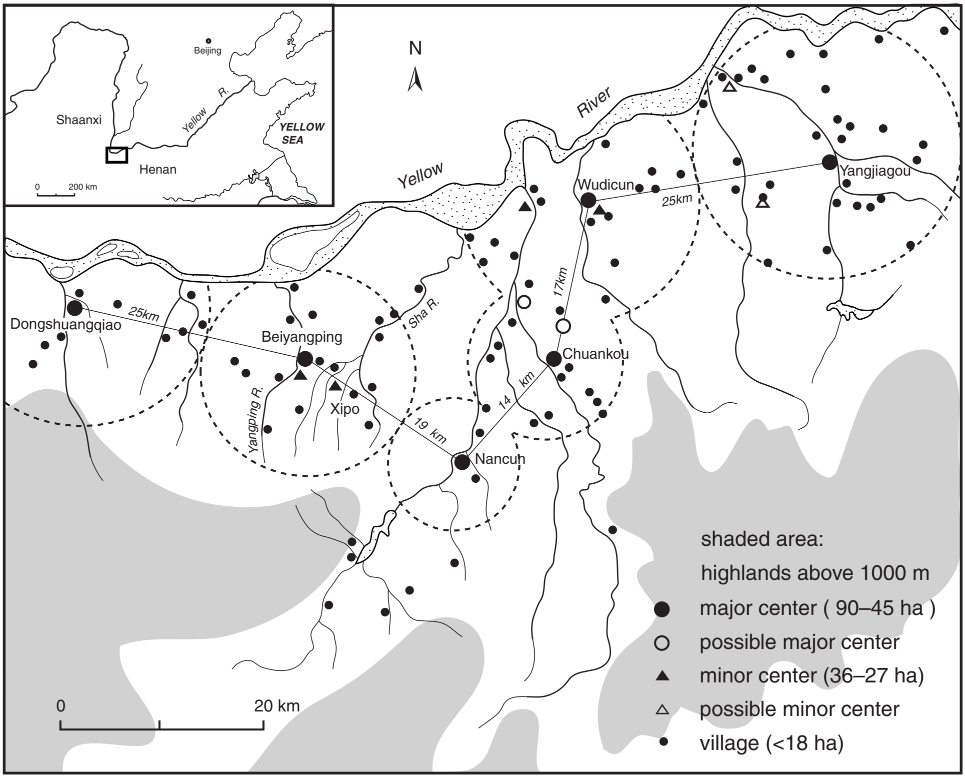


Figure 6.5 Yangshao settlement distribution in the western Henan cluster, showing a multi-centered settlement system.

have been rather small, averaging 227 km^2 (Appendix 8.1). The rank-size curve is convex, suggesting a decentralized or competing settlement system (Figure 6.2C). This inference is supported by the construction of a fortification at the Xishan site (25 ha), which was the earliest walled settlement found in the Central Plains (see chapter 4).

While the Xishan site dates to the entire Yangshao culture, the fortified enclosure was constructed at the beginning of the late-Yangshao period, and ceased to function before the end of the late-Yangshao period (ca. 3300–2800 BC). Some non-native material remains are apparently related to the Dawenkou and Qujialing cultures to the east and south of Henan, and the evidence of violence found at Xishan suggests that inter-group conflict may have played an important role in the building of this rammed-earth fortification (see chapter 4 for more details).

Similar to Xishan, at many sites in central and western Henan dating to late Yangshao and early Longshan, Dawenkou and Qujialing cultural remains and practices, such as ceramics and tooth-extraction, have been identified (Du 1992b; Sun 2000). Such phenomena may be, to some extent, the result of movements of populations from east coast regions into Henan. Such population movements coincided with climatic fluctuations, the rise of sea levels, and the marine transgression

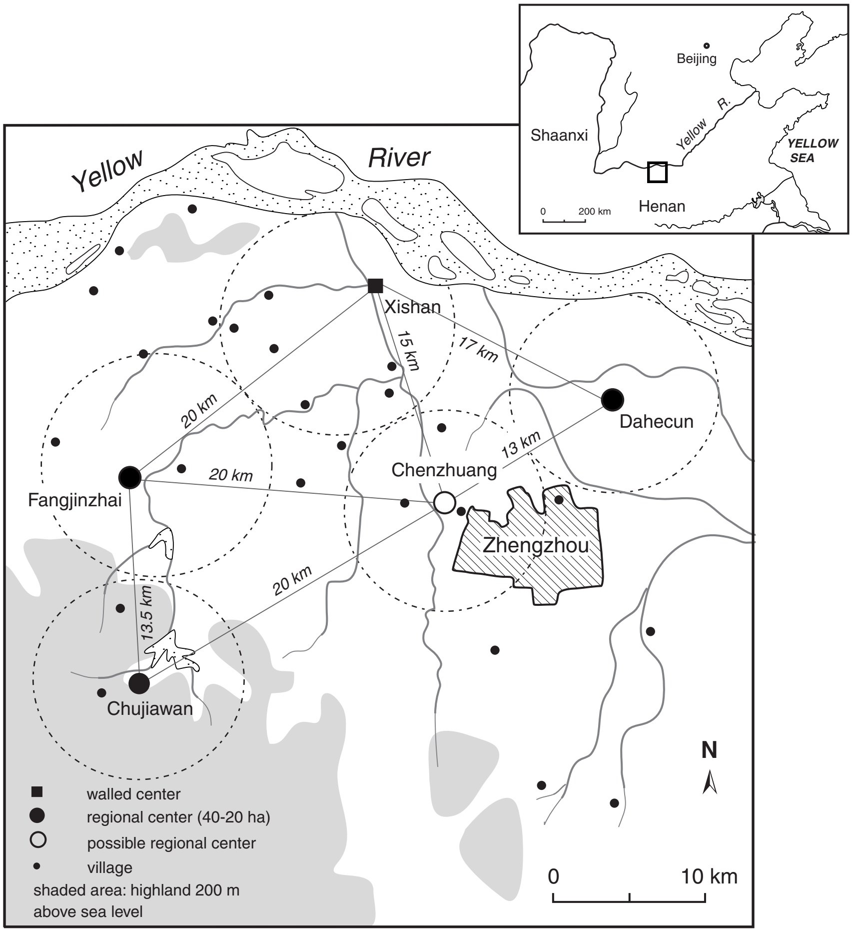


Figure 6.6 Distribution of Yangshao sites in the Zhengzhou region, showing a multi-centered settlement system.

that inundated large areas of land along the east coast regions where early and middle Dawenkou culture sites were distributed (see also chapter 7). The fact that these events coincided with the construction of the first walled town at Xishan also suggests that this new form of settlement organization may have been one of the social responses to external pressures at the time.

Late Neolithic period: the Longshan culture

Paleoclimatic conditions during the Longshan period (ca. 3000–2000 BC) were generally cooler and drier than during the previous period, and caused a reduction in the size of lakes and marshes, and expansion of arable land on the Central Plains (Cao Bingwu 1994a: 64). Thus, lowland areas became more suitable for habitation by Neolithic settlers. More than 1,100 Longshan sites have been found in Henan

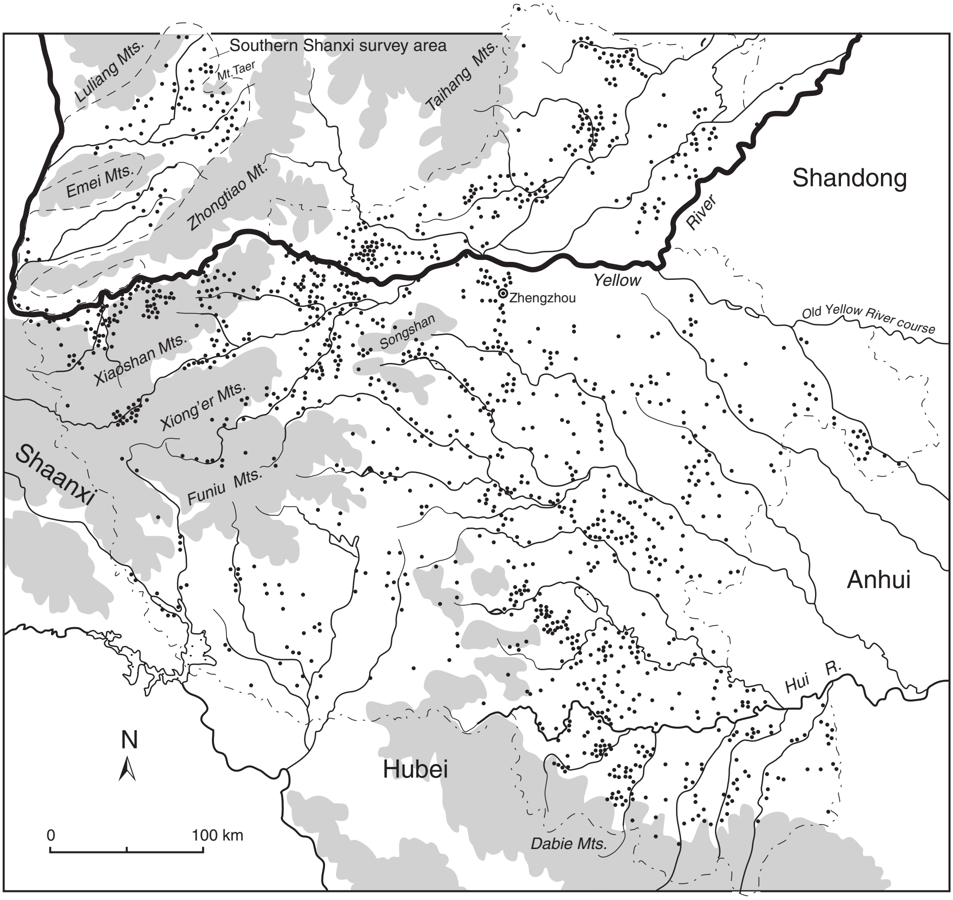


Figure 6.7 Distribution of Longshan sites in southern Shanxi and Henan (adapted from Shanxi Team 1989: figs 1–3; National Bureau 1991: maps. 36–37).

and southern Shanxi, and the largest increase in the number of sites occurred on the lowlands of central and northern Henan (Figure 6.7).

Distribution of settlement clusters Previous settlement studies indicate that Neolithic sites tend to show clustered distribution in various sizes, probably due to the physical characteristics of the Yellow River valley, where some areas are more geographically circumscribed than others. An effective way to handle such large amounts of settlement data is to identify the distributional patterns of central places in settlement systems, based on large site size and the presence of special features such as rammed-earth walls, and then analyze the relation among sites in each regional cluster (Liu, L. 1996b). I used this strategy to analyze the Longshan settlement data for the entire study area, marking possible central places if the site is either larger than 20 ha, or associated with rammed-earth walls. I classified these sites into three categories: (1) very large sites (200 to 300 ha), (2) large sites (70 to 199 ha), and (3) medium sites (20 to 69 ha) and walled sites. This initial classification for regional comparison is not followed by analysis of individual regional settlement patterns, in which the settlement hierarchy in the sub-regions is discussed separately. The levels of hierarchy are defined based on the specific site-size distribution in the sub-regions in question.

By plotting the large, medium, and walled sites on the map, we can see fourteen site clusters along the Yellow River valley. In this chapter, I will discuss Clusters 1–6 which are distributed on the Central Plains, and in chapter 7 I will examine Clusters 7–14, situated to the east and west of the Central Plains. Clusters 1–6 can be described through two general patterns of site distribution. In the first pattern, "very large" sites are present, clustered with "large" and/or "medium" sites, in two areas. They are: Cluster 1 in the Linfen Basin, southern Shanxi; and Cluster 2 in western Henan. In the second pattern, walled sites and "medium" sites were spread out evenly in Clusters 3–6, in other regions of Henan (Figure 6.8). Although most of the sites belonging to the second pattern are not closely spaced, they will still be referred to as clusters, for the purposes of this discussion.

Some of the common geographic features of Clusters 1 to 4 can be identified, adapting Carneiro's concept (1970), as characteristic of environmentally circumscribed regions. These clusters are either completely (Clusters 1 and 2) or partially (Clusters 3 and 4) surrounded by natural barriers such as mountains and large rivers. Clusters 5 and 6 in northern and central Henan, on the other hand, are situated on the lowlands of the Central Plains, with few geographic barriers. These two clusters are apparently less circumscribed. Accordingly, the six settlement clusters are divided into three types here: (1) circumscribed settlement clusters (Clusters 1 and 2); (2) semi-circumscribed settlement clusters (Clusters 3 and 4); and (3) less circumscribed settlement clusters (Clusters 5 and 6). The following discussion focuses on four of these clusters from which recent archaeological investigations have provided relatively detailed data.

Circumscribed clusters The two clusters which are physically most defined by mountains and large rivers are located on the loess plateau regions. Cluster 1 is the area where the sites of the Taosi variant are distributed, and the sites in Cluster 2 belong to the Sanliqiao variant. I will focus on Cluster 1, where recent investigations have provided a wealth of information.

Cluster 1 – the Taosi region This cluster is situated in the Linfen basin, southern Shanxi province, incorporating the Hui River and the lower reaches of the Fen River valleys, and surrounded by the Lüliang Mountains in the north, the Yellow River in the west, the Emei Mountains in the south, the Zhongtiao and Taiyue Mountains in the east, with the Taer Mountains situated in the center of the basin (Figure 6.8). This basin has abundant fresh water and fertile loess land. Pollen data from the Taosi site indicate that climatic conditions were warm and moist during the Longshan period, and that the flora in the Linfen basin was a mixture of deciduous and evergreen trees, belonging to a warm temperate forest zone (Kong and Du 1992). It was desirable

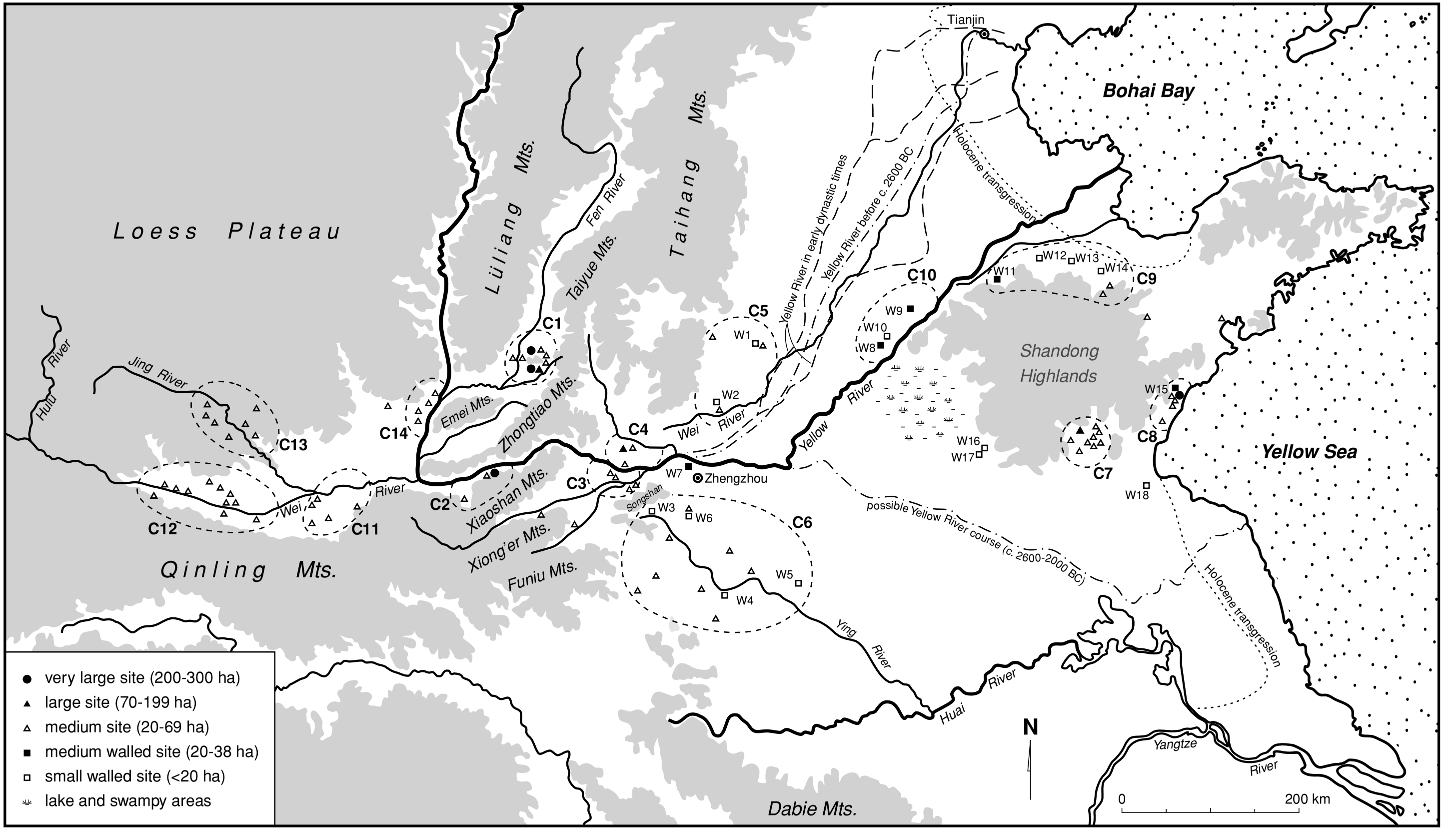


Figure 6.8 Map of the middle and lower Yellow River valley, showing major geographic configurations in the Neolithic period – topography, swampy areas, and change of coastlines and Yellow River courses (adapted from Wang Qing 1993: figs 2, 3, 4), and the distribution of fourteen clusters composed of large sites and walled settlements dating to the late Longshan culture.

Site clusters: C1: the Taosi cluster; C2: the Sanliqiao cluster; C3: the Yi-Luo River valley cluster; C4: the Qin River valley cluster; C5: the northern Henan cluster; C6: the central Henan cluster; C7: the Linyi cluster; C8: the Rizhao cluster; C9: the North Shandong cluster; C10: the West Shandong cluster; C11: the lower Wei River valley cluster; C12: the middle Wei River valley cluster; C13: the Jing River valley cluster; C14: the Hancheng cluster.

Walled sites: W1: Hougang; W2: Mengzhuang; W3: Wangchenggang; W4: Haojiatai; W5: Pingliangtai; W6: Guchengzhai; W7: Xishan; W8: Jingyanggang; W9: Jiaochengpu; W10: Wangzhuang; W11: Chengziyai; W12: Dinggong; W13: Tonglin-Tianwang; W14: Bianxianwang; W15: Dantu; W16: Xuegucheng; W17: Xikangliu; W18: Tenghualuo (W7 and W17 are pre-Longshan walled sites).

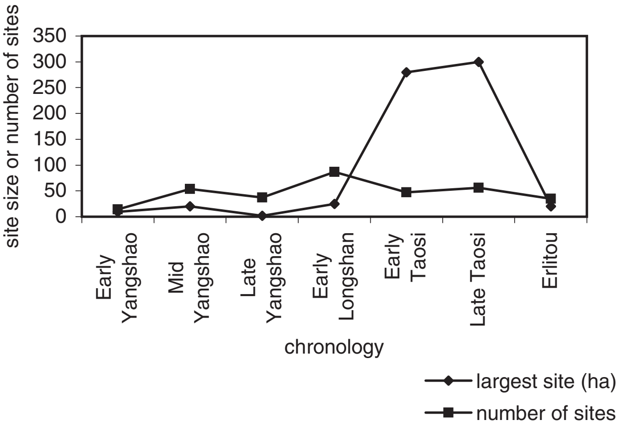


Figure 6.9 Comparison of the largest site size and site numbers from the Yangshao to Erlitou periods (ca. 5000–1500 BC), Linfen basin, southern Shanxi.

territory for social-economic development throughout ancient times. A large number of sites date to a long prehistoric period from Yangshao to Erlitou cultures (ca. 5000–1500 BC), and the capital of the Jin State of the Eastern Zhou period (770–221 BC) was located in Houma county in the basin's south.

The earliest Neolithic occupations in the Linfen basin date to the early Yangshao period, and settlement densities seem to be relatively low. There is a marked increase in the number of sites from the late Yangshao period (37 sites) to the early Longshan period (87 sites), followed by a dramatic settlement nucleation during the late Longshan period, indicated by the emergence of a large walled settlement at Taosi. The late Longshan period is generally divisible into early and late Taosi phases based on survey material, but the Taosi site is divided into early, middle and late Taosi phases based on excavated material. The early and middle excavated Taosi phases are roughly equivalent to the early survey phase (He Nu 2003 personal communication). Here I use the survey periodization in the following discussion, unless specified otherwise.

In the early Taosi phase the largest site reached 280 ha in size, represented by the Taosi walled enclosure, while site numbers significantly decreased (47 sites). In the late Taosi phase the largest site (Taosi) was still 300 ha in size, and the number of sites rose slightly (56 sites). During the Erlitou period, the size of the largest site (20 ha) and the number of sites (35 sites) both declined to levels lower than those during the Early Longshan period (Dingcun Culture Team 1986; Gao *et al.* 1984; Shanxi Team 1989; Shanxi Team *et al.* 2003a; Zhang Wenjun and Gao 1987). During the late Longshan period there was a peak in the social development in the region (Figure 6.9).

Both early and late Taosi sites show three levels of settlement hierarchy (Figure 6.10). In the early phase, Taosi (280 ha), to the north of the Taer Mountains, appears to have been the major center, with a rammed-earth enclosure. A few minor centers (24 to 128 ha) and a large number of villages (<14 ha) are distributed on

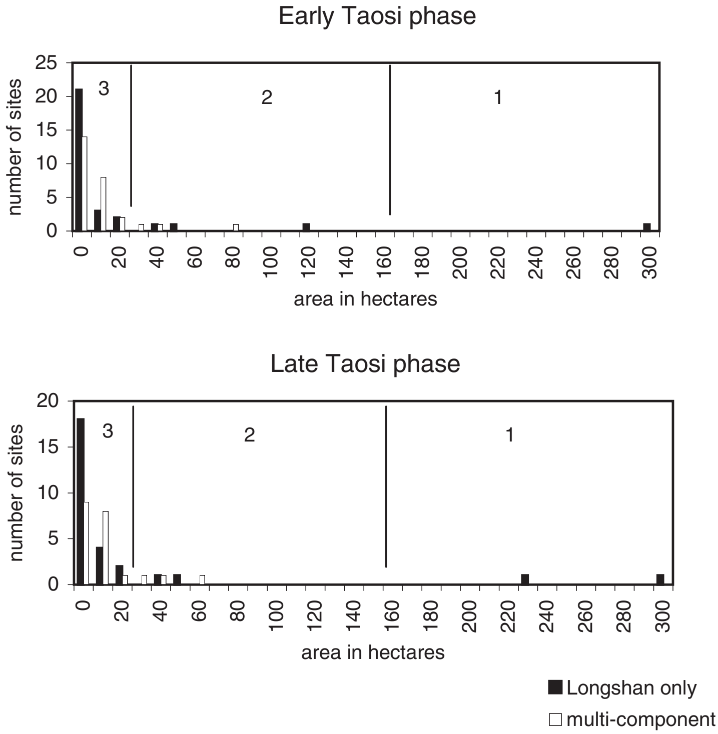


Figure 6.10 Three levels of settlement hierarchy of the early and late Taosi phases, Longshan culture.

both sides of the Taer Mountains (Figure 6.11). The rank-size distribution shows a primate and near log-normal curve (Figure 6.12A), suggesting that Taosi was probably the dominant center of an integrated regional social system, which included the larger part of the Linfen basin. If this were the case, Taosi may have controlled an area measuring about 3,300 km^2 (Appendix 8.2)

During the late Taosi phase, the site-size distribution continues to demonstrate three levels of settlement hierarchy, but the basin seems to have been dominated by two major centers (Figure 6.10). Taosi was no longer protected by the enclosure, and residences spread over an area of 300 ha. The large site of Fangcheng-Nanshi (230 ha) emerged to the south of the Taer Mountains. These two central places, each clustered with minor centers (24 to 50 ha) and villages (<12 ha), seem to have separately dominated the northern and southern areas of the Linfen basin (Figure 6.11). The distance as the crow flies between these two centers is about 20 km, but the actual traveling distance is much greater, due to the mountainous landscape. The rank-size curve becomes convex (Figure 6.12A), suggesting a disintegrated or competing settlement system. Fangcheng-Nanshi seems to have been a new regional power, which challenged the domination of Taosi. Each sub-regional center thus may have controlled an area about 1660 km^2 (Appendix 8.2). During the late Taosi period, there was a fundamental change in regional social organization, from a unified political system to a decentralized one, perhaps as the result of increased military

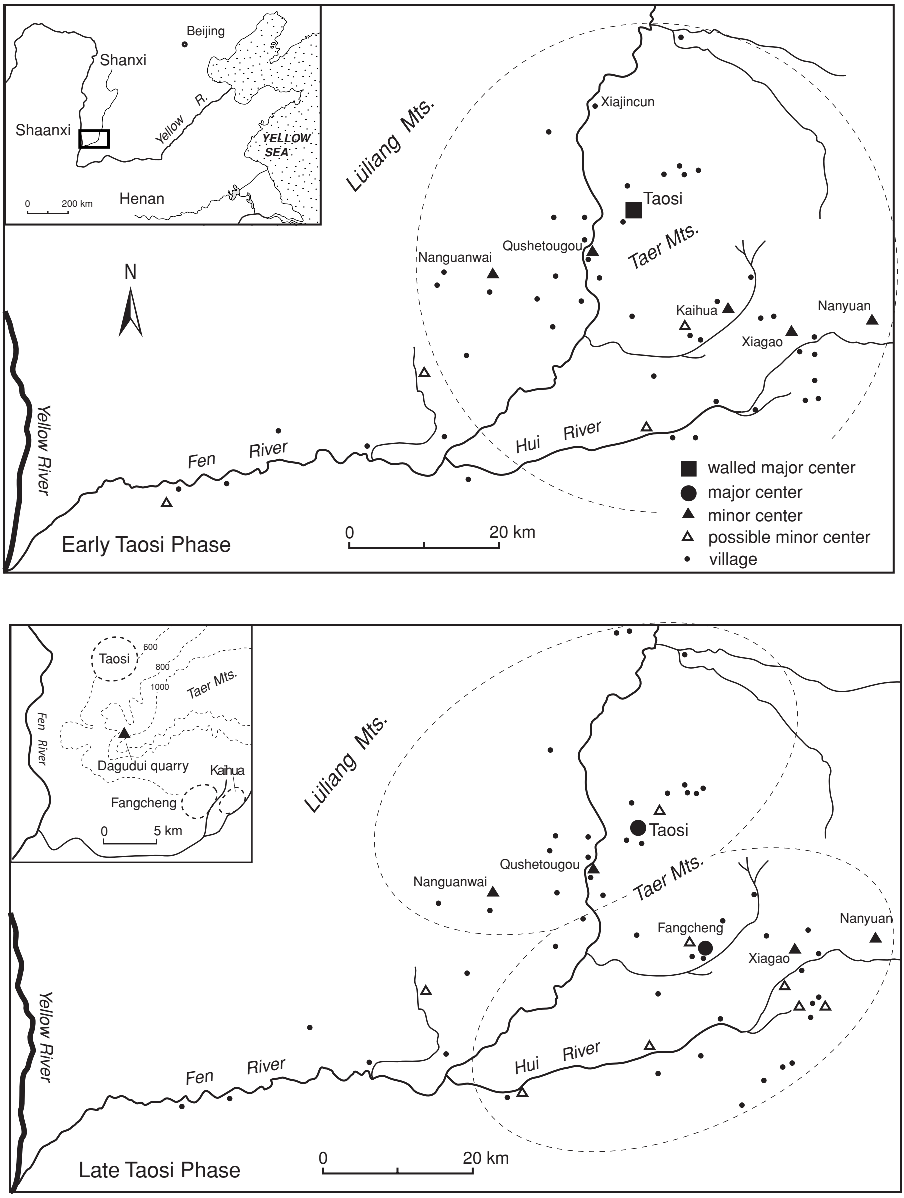


Figure 6.11 Distribution of sites in the early and late Taosi phases, Longshan culture (adapted from Dingcun Culture Team 1986: fig. 1; Shanxi Team 1989: fig. 3; Zhang Wenjun and Gao 1987: fig. 1).

competition between sub-regional polities. The archaeological evidence of violence found at Taosi (see chapter 4) seems to support this interpretation.

Settlement nucleation during the late Longshan period implies marked population growth, not only caused by normal and local population growth, but also resulting from the migrations of people from other regions, particularly from the north. According to a preliminary observation of the human skeletal remains by Pan (1989:

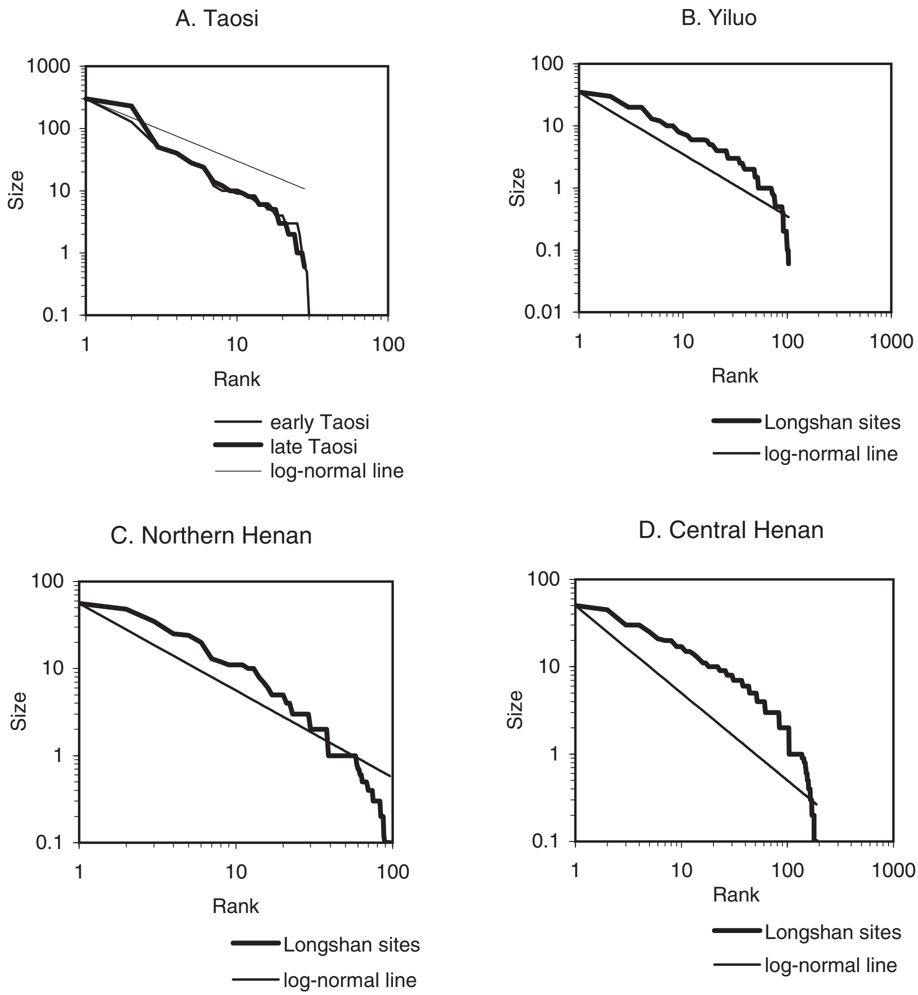


Figure 6.12 Comparison of rank-size distributions of (A) the Taosi Cluster in the early Taosi phase: primate curve, (B) the Yiluo region: convex curve; (C) northern Henan: convex curve; and (D) central Henan: convex curve; all late Longshan period.

296), the Longshan population at Taosi includes mixed groups of people who were not all from the local area. Some skeletons were similar to those from northern regions including Inner Mongolia (Pan Qifeng 1993, personal communication).

Pollen profiles from central and eastern Inner Mongolia between 4,700 and 4,000 BP (3700–2200 cal. BC) show marked increases in drought-resistant herbs and shrubs, indicating the occurrence of a cold and dry climate (Cui and Kong 1992). Therefore, climatic fluctuation may have played a major role in causing agricultural failure in the northern regions, leading to subsequent population migration to the south in search of arable land. The optimal climatic conditions of the Linfen basin probably attracted migrants, who contributed to the development of highly nucleated settlement patterns in this environmentally circumscribed region.

The Taosi settlement system appears to be the most complex one on the Central Plains. However it declined after the Longshan period, as shown by low frequency in the number of sites and smaller site size during the following Erlitou period (Figure 6.9). This region then became the periphery of the newly developed Erlitou state centered in the Yiluo basin, western Henan (see chapter 8).

Semi-circumscribed clusters The site clusters in the Yiluo and Qi River regions are categorized as semi-circumscribed settlement systems, and new data generated from the recent Yiluo survey project have significantly improved our understanding of the evolutionary development of this region (Liu, L. *et al*. 2002–2004).

Cluster 3 – the Yiluo River region This region, including Gongyi, Yanshi, Luoyang, Mengjin, and Xin'an counties/cities, is a fertile alluvial basin in the lower Yiluo River valley (about 120 m or more in altitude). The basin is defined in the north by the Mangling hills, which separate the Yiluo Plain from the Yellow River, and is surrounded by mountain ranges on the other three sides, from west to east including the Xiaoshan, Xiong'er, Funiu, and Songshan Mountains, at altitudes of 500 to 2,000 m (Henan Bureau 1987). Despite these natural barriers, this region is effectively connected by its rivers to other surrounding regions. In addition, it is not a completely circumscribed region, as there is virtually no natural barrier in the southeast, where it opens onto the Huang-Hui Plains in central Henan (Figure 6.8). The Yiluo River valley has long been regarded as the heartland of early Chinese civilization. The earliest urban site, Erlitou, is located here (see chapter 8), and at least ten dynasties since the Eastern Zhou established their capitals in the basin (Zhao Zhiquan and Xu 1986).

Traditional archaeological surveys in this region before the 1990s demonstrate a long history of human occupation, including more than 80 Yangshao sites and 90 Longshan sites, distributed over an area about 4,000 km^2 (National Bureau 1991; Zhao 2001). These site figures, however, have been under-estimated, according to the new data generated from a full-coverage survey program in the eastern part of the Yiluo region. By 2002 the project had recorded more than 200 sites in an area of 200 km^2, dating from the Peiligang culture to the Eastern Zhou period (ca. 6000–200 BC). Using a finer chronology, this project dates most sites to phases as short as a hundred years within each archaeological culture period. This improves our confidence in the contemporaneity of sites under study (Liu, L. *et al*. 2002–2004).

The survey results suggest that a few small Peiligang and early Yangshao settlements sparsely occupied the research area. During the subsequent middle and late Yangshao periods, there was a marked increase in population, and also the development of the first two-tiered settlement hierarchy. The largest site measured 20 ha in area, and the number of sites increased from 16 in the middle Yangshao period to 47 in the late Yangshao period. However, there was a dramatic decline in site size and numbers during the early Longshan period, before there was another growth in population during the late Longshan period (Liu, L. *et al*. 2002–2004).

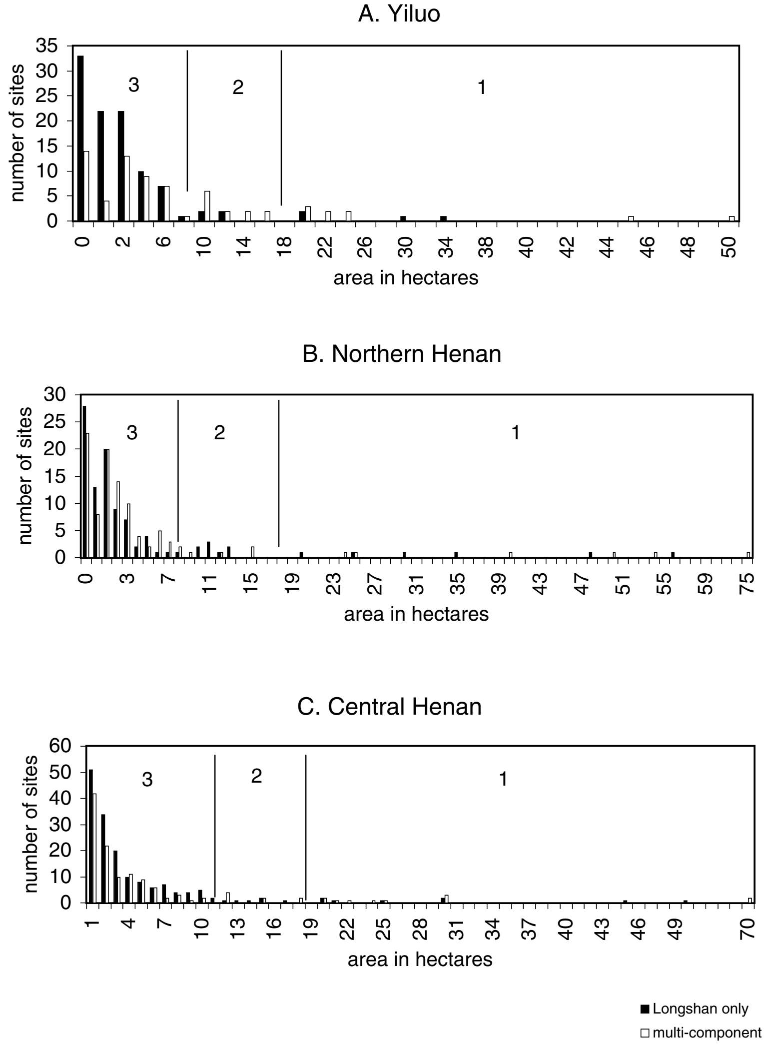


Figure 6.13 Comparison of settlement hierarchy of (A) the Yiluo valley cluster: three levels (B) northern Henan: three levels; and (C) central Henan: three levels, all late Longshan period.

Combining the results from traditional and full-coverage surveys, a total of 171 Longshan sites (including 77 from the full-coverage survey dating to the late Longshan period), belonging to the Wangwan variant, have been found across the entire Yiluo region (Liu, L. *et al.* 2002–2004; National Bureau 1991: maps. 68–69, 92–101, account. 34–35, 101–122; Qiao 2003; Zhao Chunqing 2001: 140–185). Most sites are multi-component, especially in the area near Luoyang, a situation making site-size estimation based on traditional survey data very difficult. The site-size distribution indicates a three-tiered settlement hierarchy, composed of (1) 13 major centers (20 to 35 ha) including 9 possible centers, (2) 8 minor centers (10 to 19 ha) including 5 possible centers, and (3) many villages (<1 to 8 ha) (Figure 6.13A).

The two largest centers, Poluoyao (30 ha) and Dayanghe (35 ha) are close, about 6 km apart. This suggests that these two sites were not contemporaneous, but each dominated a sub-cluster of settlements at different times. Most centers were relatively small, and scattered over the landscape, except for the area near Luoyang, where several multi-component sites larger then 20 ha were closely spaced (Figure 6.14). Since it is not possible to determine the exact site size during the Longshan period, I marked the Xigaoyai site (21 ha) as a sub-regional center, based on its relatively larger site size. Although the histogram shows a three-tiered site hierarchy, most sub-clusters only have a two-tiered settlement hierarchy. The rank-size distribution also presents a convex curve (Figure 6.12B), suggesting that there was a decentralized or competing settlement system. The distances between centers ranged from 17 to 34 km, and averaged at 25 km. The average catchment area is 491 km^2 (Appendix 8.3).

Based on the results from the recent Yiluo regional survey and excavation, several sites near the Songshan Mountains have provided evidence of stone-tool manufacturing, which utilized the rich limestone resources of the mountainous regions. Among these sites Huizui produced not only a large number of limestone spades, but also lime made from the debitage of the stone-tool production. Both products were utilitarian in function: limestone spades were used for digging soil and lime was commonly used for plastering house floors during the Longshan and Erlitou periods. Huizui (10 ha) appears to be a minor center in the Zhangwan sub-cluster. This raises questions not only about the function of craft production centers, but also about the economic relationship between major and minor centers. As the Yiluo region has diverse natural resources near the mountainous areas, and diverse land quality between lowlands and highlands (Liu, L. *et al.* 2002–2004; Qiao 2003), it is possible that these sub-clusters formed regional economic networks, with some degree of craft specialization conducted at different settlements. Further investigations at Huizui and other sites in this area will assemble better data to test these propositions.

It is interesting to note that while the first urban center emerged at Erlitou in the Yiluo basin during the Erlitou period (ca. 1900–1500 BC), the preceding local Longshan societies appear to have been much less complex, in terms of levels of settlement hierarchy, size of the major centers, and size of catchment area, when compared to those societies of the Taosi cluster.

Less-circumscribed clusters The two site clusters in north and central Henan, characterized as less-circumscribed settlement systems, are both situated on the Yellow River flood plains.

Cluster 5 – the Northern Henan region Northern Henan, including the five districts of Jiaozuo, Anyang, Hebi, Xinxiang, and Puyang, is a lowland region of the Central Plains joined to the Taihang Mountains in the west. This region, formed by the Yellow River, the Wei River, and their tributaries, has a low altitude (50 to 100 m above sea level, and the landscape is high in the west and low in the east), with rich soil, and abundant water resources (Henan Bureau 1987).

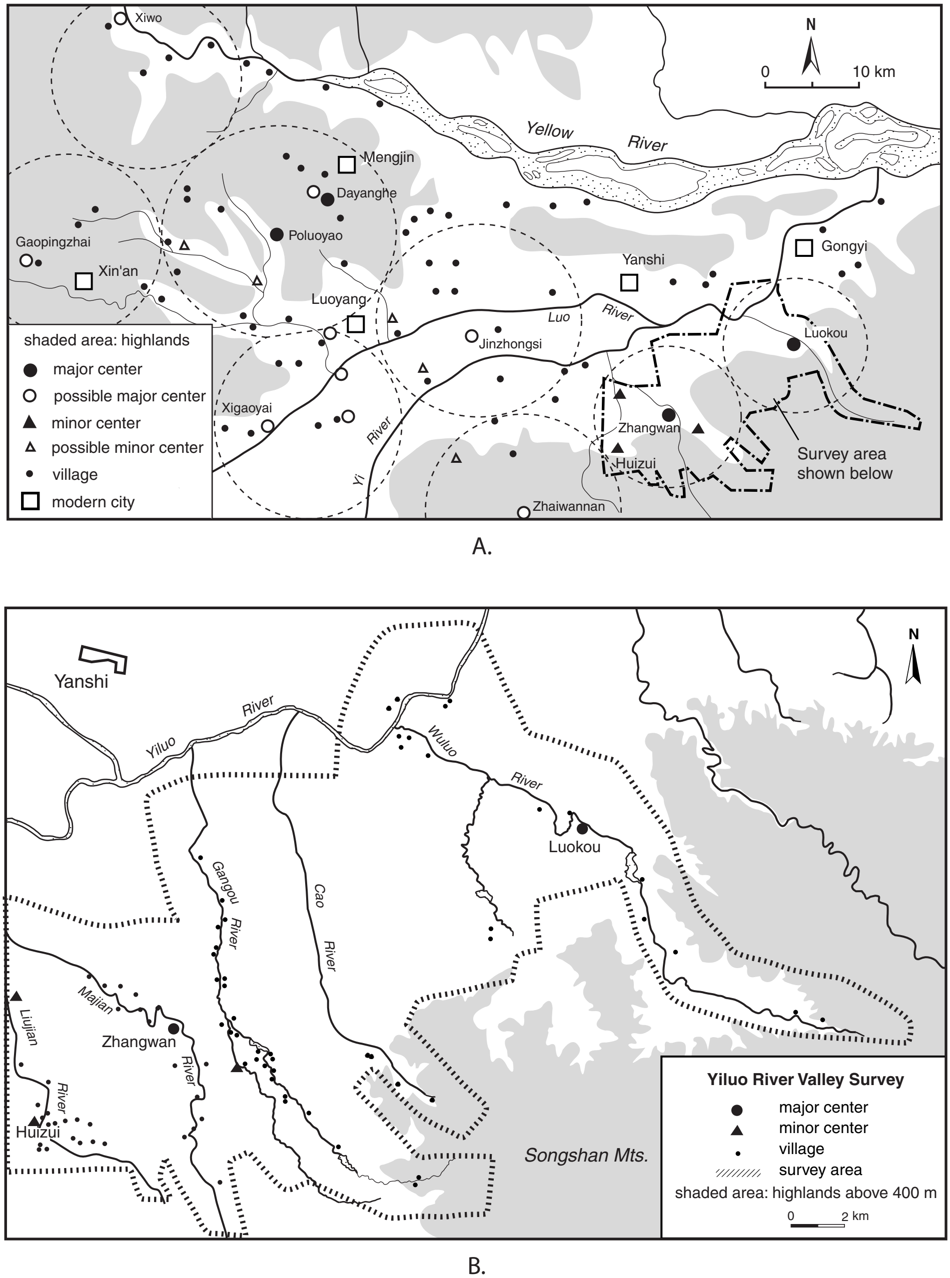


Figure 6.14 (A) Distribution of Longshan sites in the Yiluo valley cluster, and (B) the result of full-coverage survey in the Gongyi region, Longshan culture (adapted from National Bureau 1991: maps. 92–101, Liu *et al.* 2002–2004: fig. 8).

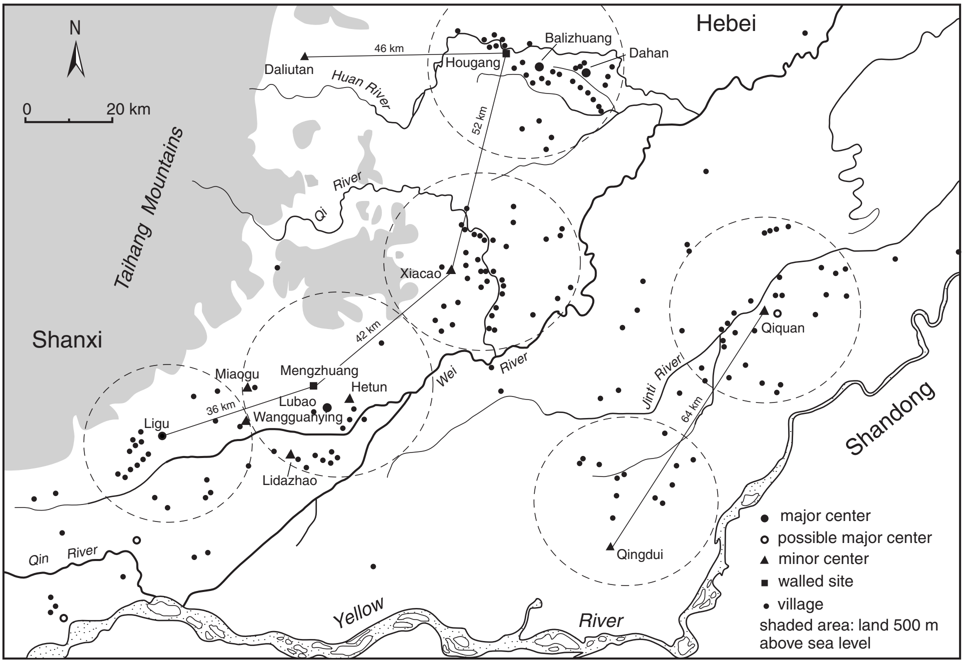


Figure 6.15 Distribution of Longshan sites in the northern Henan cluster (adapted from National Bureau 1991: maps. 112–113, 124–155).

This region experienced rapid population growth during the late Neolithic period, with the number of its sites increasing from 62 during the Yangshao period (<1–15 ha) to more than 200 during the Longshan period (National Bureau 1991: maps.112–113,124–155, account. 160–168, 212–312; Sino-American Huan 1998). The ceramic type common to this region belonged to the Hougang variant during the Longshan period, and most sites are distributed along river courses. The site-size distribution shows a three-tiered settlement hierarchy, including (1) 5 first-rank centers (30–56 ha); (2) 9 second-rank centers (10–25 ha); and (3) nearly 190 villages (<1–8 ha) (Figure 6.13B).

These sites are clustered into six groups, which are divisible into two sections. Four of them are situated on the west and two on the east, with a few sites scattered in the central area (Figure 6.15). This central area was where the old Yellow River courses flowed during the early Neolithic and the Dynastic periods (Figure 6.8). There may have been more site clusters in this region, which were either destroyed by frequent changes in the course of the Yellow River, or have been covered by deep silt.

The settlements in the western section have been investigated more thoroughly than those in the eastern section, so my discussion will focus on the former. The distances between the sub-regional centers appear to be similar, ranging from 36 to 52 km, with an average distance of 44 km and an average catchment area of 1519 km^2 (Appendix 8.4). The rank-size distribution expresses a convex curve

(Figure 6.12C), indicating a decentralized or competitive settlement system. Two sub-clusters, Hougang and Mengzhuang, revealed detailed information for our understanding of the settlement organization there.

The Hougang sub-cluster is distributed mainly along the Huan River valley in north Henan, a region where the Shang dynasty built its last capital city near Anyang. Chinese archaeologists surveyed the region during the 1960s, locating more than 30 sites in the river valley. A recent regional survey project, carried out by the Sino-American Anyang Team, intensively resurveyed and verified most of these previously recorded sites, with sub-surface coring employed at several settlements. The team also surveyed extensive areas that had not been investigated before. About 800 km^2 had been resurveyed by 1999, and survey results provided new insights into the development of social complexity in this region from the Yangshao to the Eastern Zhou periods (ca. 5000–200 BC) (Jing *et al.* 2002; Sino-American Huan 1998).

Human settlement of the Huan River valley began during the Yangshao culture period. In spite of the very long time span, the distribution of Yangshao sites is sparse, and there appears to have been no dramatic change from its early phase (twelve sites, with the largest one measuring 10 ha) to its late phase (seven sites, with the largest one measuring 15 ha) during this 2,000-year period. A two-tiered settlement hierarchy is observable. During the following Longshan period, the number of settlements and their geographic distribution expanded drastically. A total of 35 sites was located, and three major central settlements, Hougang, Xiaobalizhuang and Dahannangang (30 to 56 ha), appeared for the first time (Jing *et al.* 2002; Sino-American Huan 1998), and may have formed a three-tiered settlement hierarchy. One of the large centers, Hougang (30 ha; Tang Jigen 2003, personal communication), may have been a walled settlement, as indicated by the discovery of a section of remaining rammed-earth wall, 70 m long and 2 to 4 m wide in the 1930s (Yin 1955: 54–55), which dates to ca. 2500–2300 BC (Qu 1989; Sui 1988: 47). The close spacing of these major centers suggests that they may have dominated the region at different times.

The expansion of Longshan settlements was followed by the Xiaqiyuan and early Shang periods (ca. 2000–1420 BC), during which there was a perceptible reduction in site number (14). All sites from these periods are no more than 1 ha in size, and no settlement hierarchy is observable. This situation changed when a very large walled city of the middle Shang period was constructed at Huanbei, north of the Huan River (ca.1420–1250 BC), followed by the development of the capital city of the late Shang period (ca. 1250–1046 BC) centered at Xiaotun (Jing *et al.* 2002; Sino-American Huan 1998).

The Mengzhuang sub-cluster is a group of sites distributed along the upper Wei River valley in Huixian and Xinxiang (Figure 6.15). It includes 2 major centers, Lubao (48 ha) in Xinxiang and Mengzhuang (25 ha) in Huixian, 4 minor centers (11 to 13 ha), and 21 villages (< 8 ha) (National Bureau 1991: maps. 130–133, account. 236–242). These sites are situated on the flood plains of several small rivers which originate in the Taihang Mountains to the northwest, and, according to historical documents, there were many springs and lakes in the area in ancient times (Yuan 2000a).

A square-shaped rammed-earth walled settlement (16 ha) was discovered at Mengzhuang, located on a terrace, between the mountainous areas to the north, and a river or lake to the south. The remaining walls are 330 to 375 m long on each side and about 15 m wide. A moat, 20 m wide and up to 4.8 m deep from ancient ground level, surrounded the walls. A gate, 2.1 m wide, was situated in the middle of the eastern wall. The rammed-earth enclosure was initially built ca. 2400 BC, and appears to have been destroyed by floods near the end of the late Longshan period (ca. 2100 BC). A thick silt sediment mixed with Longshan sherds provides evidence of flooding, and it covers most of the site. This period was followed by two hundred years (ca. 2100–1900 BC) of the absence of material remains at the site. The walls however were repaired and reused during the Erlitou period (ca. 1900–1500 BC) (Henan Institute 2000a; Yuan 2000a, b).

About 8 km southeast of Mengzhuang is another center, Lubao, which has not been excavated. Mengzhuang and Lubao were probably two centers that subsequently developed during the Longshan period, and only one of them dominated the region at any given time. As a result, three levels of site hierarchy can be observed in this sub-cluster (Figure 6.15).

In summary, the Hougang and Mengzhuang sub-clusters share a similar settlement pattern. Each had a three-tiered settlement hierarchy, experienced the alternation of major centers within the sub-region, and constructed a rammed-earth enclosure at a central place. The relationship between regional centers is likely to have been competitive in nature. These characteristics, as discussed below, may also be observed at settlements in the central Henan region.

Cluster 6 – the central Henan region This region, referred to as the Huang-Huai Plains, south of the Yellow River and east of the Songshan and the Funiu Mountains, is also a lowland region of the Central Plains (100 to 30 m in altitude) (Henan Bureau 1987). The northeastern portion of the region, where an old course of the Yellow River still exists (Figure 6.8), is one of the areas frequently flooded by the Yellow River. The silt deposits dating from the historical period can be as thick as 10 m or more in some areas. This has changed the topographic configuration dramatically by raising the ground level, burying ancient architectural remains, and flattening hills (Shi Nianhai 1981: 63–77). Recent geological surveys conducted by the Shangqiu international collaborative project have located an Eastern Zhou rammed-earth city 12 m below the present ground level, after drilling more than 700 cores (Jing *et al.* 1997; Murowchick and Cohen 2001). According to archaeological surveys, most of the sites are located on higher mounds along rivers, implying that sites located on lower levels may have not yet been found. Fewer sites have been found in this area than in other parts of the region (Figure 6.7).

This region includes six districts: Zhengzhou, Kaifeng, Zhoukou, Luohe, Xuchang, Pingdingshan, and Zhumadian. The ceramic type they have in common is known as the Haojiatai variant (Figure 1.1). Several rivers, mainly the Ying River

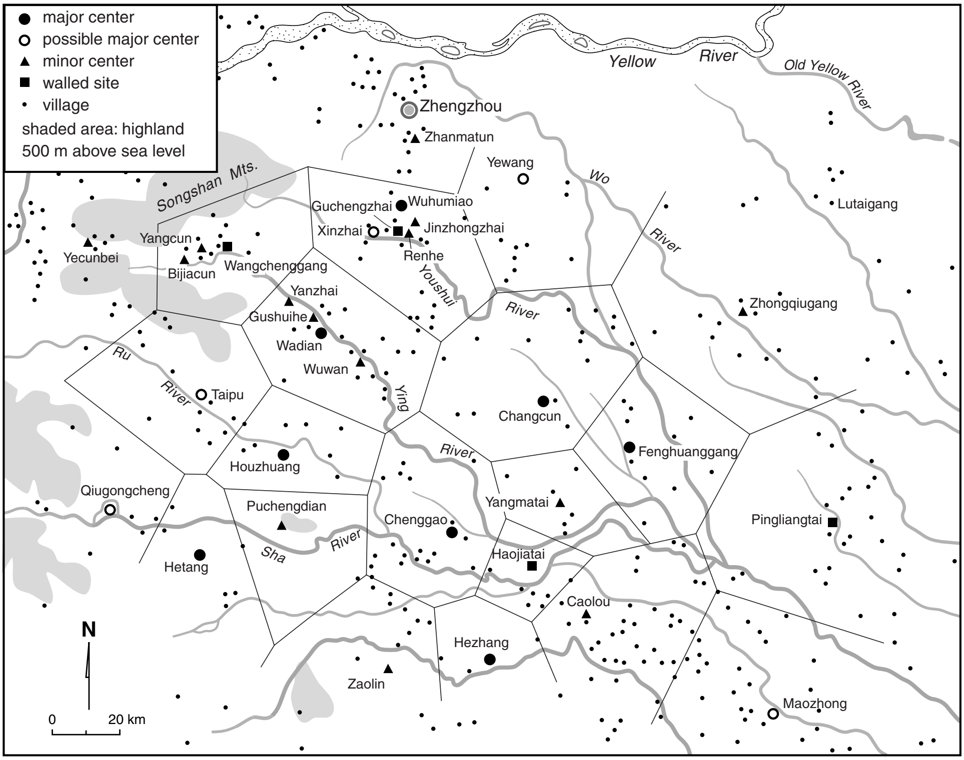


Figure 6.16 Distribution of Longshan sites in the central Henan cluster (adapted from National Bureau 1991: maps. 60–91, 184–187).

and its tributaries, flow from northwest to southeast and then join the Huai River. Some 330 Longshan sites have been identified, and the histogram of the site-size distribution suggests a three-level settlement hierarchy: (1) 8 medium centers (20 to 50 ha); (2) 9 small centers (10 to 17 ha); and (3) more than 310 small sites, >1 to 9 ha in size. Four of these sites have rammed-earth enclosures (Figure 6.13C). The centers and walled sites are spread out over the landscape, probably representing sub-regional central places. Some twenty such clusters may be observed, and most of them show two-tiered settlement hierarchy, except for three, centered in the northwestern part of the region, which have a three-tiered settlement hierarchy (Figure 6.16). The rank-size distribution shows a strong convex curve, suggesting a decentralized and competing settlement system (Figure 6.12D).

All centers are situated near rivers. The distances between them range from 25 to 63 km, averaged at 40 km, and the average catchment area is 1256 km^2 (Appendix 8.5). Three sub-clusters centered on Wangchenggang, Guchengzhai, and Wadian developed the most complex settlement systems in the region.

The Wangchenggang sub-cluster is situated in the alluvial region southeast of the Songshan Mountains, in the upper Ying River valley (Figure 6.16). As discussed in chapter 4, Wangchenggang appears to have been the central place. It was a large settlement (50 ha), with a rammed-earth enclosure (1 ha, ca. 2455–2280 BC) associated with many special features, indicating its political and economic significance in the sub-region. 17 other Longshan sites, closely clustered to Wangchenggang, have been found, including 2 secondary centers, Bijiacun (10 ha) and Yangcun (10 ha), and 15 small villages (Fang 2002) (Figure 6.16). This group of sites appears to form a three-tiered settlement hierarchy.

The Guchengzhai sub-cluster is centered at a walled town, Guchengzhai (25 ha), in Xinmi county. This cluster is composed of more than a dozen medium and small sites, including 2 medium centers at Wuhumiao (35 ha) and Xinzhai (35–70 ha, based on different reports), 2 secondary centers (11–10 ha), and a number of villages smaller than 7 ha (Figure 6.16).

The three large sites in this sub-cluster may not have all been contemporaries. Guchengzhai appears to have been the major center during the late Longshan period, as indicated by the construction of rammed-earth walls and the palatial complex; the settlement declined toward the end of the Longshan period, when its palatial compound was abandoned and domestic features were built into the rammed-earth walls (see chapter 4). This event coincided with the emergence of a large settlement at Xinzhai, which dates to a transitional period between the late Longshan and early Erlitou periods. Some elite objects have been found at this site, including two jade *cong* tubes and a few white pottery sherds. Two fragments of copper objects and some slag indicate that metallurgy may have been practiced (Henan 2nd Team 1981; Peking University 2000; Zhao Qingchun 2002).

Current data do not provide us with detailed dates for Wuhumiao, and it remains to be seen if it was earlier than Guchengzhai. This sub-cluster seems to have developed a three-tiered settlement hierarchy, perhaps with different major centers dominating the area at different times.

The Wadian sub-cluster is composed of a major center, Wadian (20 to 50 ha, based on different reports), 3 secondary centers (10 to 18 ha), and 14 small villages (6 ha or less) in Yuxian along the Ying River valley (Fang 2002; Henan Institute 1991: 106). These sites together form a three-tier settlement hierarchy (Figure 6.16). Wadian was excavated in the 1980s and 1990s, and the settlement seems to have been heavily populated during the Longshan period, as the cultural deposits were up to 4 m thick. Several jade objects were unearthed, including a bird-shaped ornament and an axe from the urn burial of an adult male. Some human bones belonging to three individuals were found in a pit associated with a house (F8), and are perhaps related to human sacrifice. Many drinking vessels were found, including *gui* and *he* pitchers, *gu* cups, and egg-shell pottery goblets. The last form is commonly seen in the elite burials of the Shandong Longshan area (see chapter 5), but is rarely found in central Henan (Henan Institute 1983c, 2000b). It is not clear, however, if the egg-shell pottery was made locally or obtained from the east. The presence of this prestige item suggests the existence of an elite group at Wadian, although such a situation has not been found at any other sites in this region.

In summary, these three major centers form a triangle of approximately equal sides (48, 37, 36 km), averaging 40 km. Each cluster seems to have a well-defined boundary with few sites occurring in peripheral areas, suggesting the coexistence of territorially oriented polities. Such equidistant distribution of central places, together with the presence of defensive rammed-earth walls, confirms the competitive nature of these polities, something they have in common with settlements in the northern Henan region.

In addition to Wangchenggang and Guchengzhai, two more walled Longshan sites, Pingliangtai (see chapter 4) and Haojiatai (Henan Institute 1992b), have been found in recent years. The actual number of such walled settlements is likely to be even higher than what we know of today. The Yellow River flood plains of central and northern Henan may have been dotted with a few dozen polities showing one- or two-tiered administrative hierarchies.

Social complexity in the less-circumscribed regions

In order to understand the evolutionary trajectories of Neolithic societies in different regions, we need to examine the patterns of demographic change at each settlement cluster throughout the Neolithic period. Figure 6.17 compares the number of sites and the largest site sizes in the six clusters from Yangshao to Longshan. The north Henan and central Henan clusters, in the environmentally less circumscribed regions, demonstrate the highest increase in site numbers, while the Taosi and west Henan clusters, both found in circumscribed regions, reveal the highest increase in the size of the largest site.

Central Henan in particular experienced the most rapid increase in the number of sites and the development of multiple walled settlements during the Longshan period. In addition, this region experienced another important cultural change, indicated by a number of sites with cultural remains belonging to the Dawenkou culture of Shandong and eastern Henan, and to the Qujialing culture of Hubei (Figure 6.18). These remains were not limited to pottery styles, but involved cultural traits, such as head deformation and tooth extraction in burials. These intrusions of material assemblages were more likely to be associated with population movement than long-distance trade. The construction of the town wall at Xishan during the

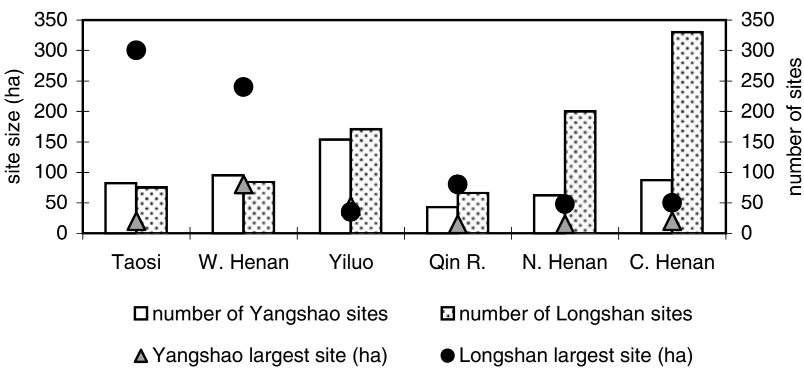


Figure 6.17 Comparison of the number of sites and the largest site size from Yangshao to Longshan in seven settlement clusters.

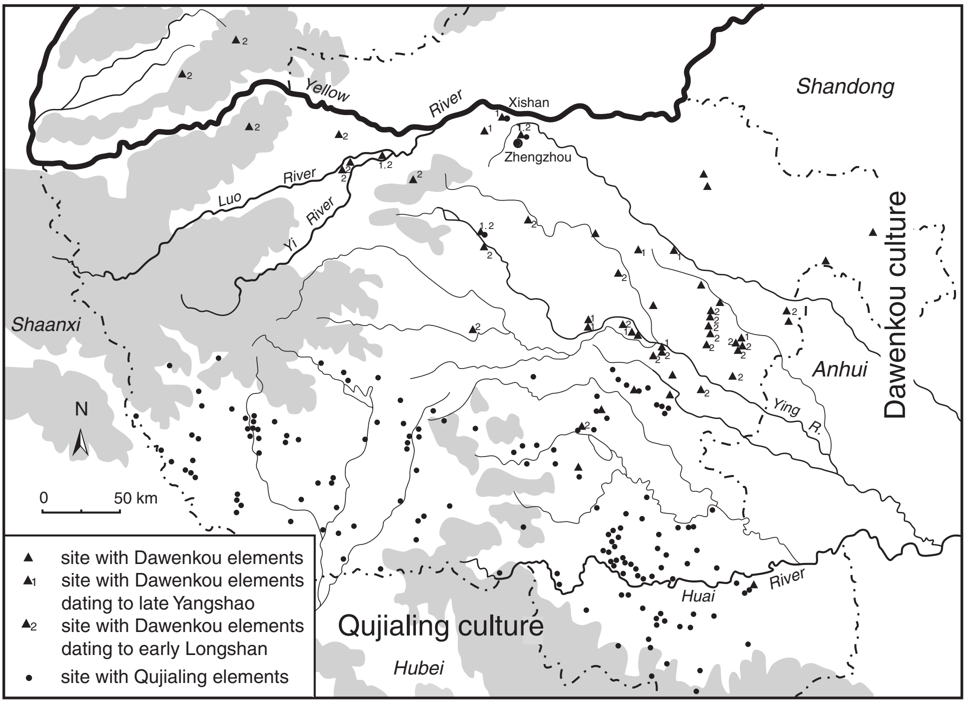


Figure 6.18 Distribution of sites with Dawenkou and Qujialing cultural elements on the Central Plains (Based on National Bureau 1991: maps. 38–39; Du 1992b: fig. 1; Zhao Qing 1994).

late Yangshao period, as discussed before, may have been partially attributable to the social impact from the population who moved there from eastern and southeastern regions. In the early Longshan period, Dawenkou and Qujialing cultural elements occurred mostly to the southeast of the central Henan region, and some of them appeared to have moved further westward to the southern Shanxi region. These elements finally disappeared from the Central Plains in the late Longshan period (Du 1992b; Zhang Zhiqing 1994; Zhao Qing 1994).

Such a large-scale population movement on an inter-regional basis during the late fourth and early third millennia BC may have been related to changes in climatic and environmental conditions. During the early and middle Neolithic periods the Yellow River's lower course in the Central Plains turned to the northeast near Zhengzhou, and then flowed through the Hebei Plain into the Bohai Bay (Figure 6.8). A few Yangshao sites were found in northern Henan with a site-free area in the center, through which the Yellow River flooded (Figure 6.3). The Yellow River, therefore, may have formed a natural barrier to the cultural interaction between the regions in the west and the east (Wang Qing 1993).

The situation changed when the Yellow River shifted its lower course during the late Neolithic period, flowing through east Henan and north Jiangsu to the Yellow Sea (Figure 6.8). The exact time of this event cannot be pinpointed, but it seems to have happened sometime around 2600 BC (Wang Qing 1993, 1999). As a result, the Central Plains north of the Yellow River became a massive area, with no significant natural barrier between northern Henan and northwestern Shandong. This geographic precondition facilitated interactions between social groups over a broad region. Late Longshan culture then experienced not only a rapid increase in the number of sites, but also even stronger cultural interactions between the Henan and the Shandong regions. Some cultural elements, such as certain ceramic forms, tools, and architectural styles were shared by the Longshan people in both western Shandong and the Central Plains (Cai 1992; Wang Qing 1993). The two walled settlements found at Hougang and Mengzhuang in northern Henan, as well as several walled sites identified in western and northern Shandong (Underhill 1994; Wang Shougong 1996; Zhang Xuehai 1995) (Figure 6.8) may have been constructed in this cultural context.

In contrast, when the Yellow River flowed in its northern course, central Henan was a massive plain. The mid-Dawenkou culture in Shandong (3500–3000 BC), as discussed above, had begun to move further west during the late Yangshao period. More than 40 sites containing Dawenkou cultural elements have been identified in these regions. At these sites, Dawenkou remains were found in association with at least 17 late Yangshao period sites and 33 early Longshan sites (Figure 6.18).

While Dawenkou cultural remains continue to appear in central Henan, there seems to have been an absence of settlement from the late Dawenkou to early Longshan periods (ca. 3000–2300 BC) in northern Jiangsu, contemporaneous with an episode of marine transgression in the east coast (4,600–4,000 BP; or 3650–2200 cal. BC) (Table 7.1). This kind of population movement seems to have been discontinued during the late Longshan period, and perhaps relates to the Yellow River's changing course from north to south, forming a natural barrier for settlements between Shandong and Henan.

Moreover, the Qujialing culture in Hubei also spread northwards into central Henan during the late Yangshao and early Longshan periods, although the exact reasons for this movement are unclear. The Qujialing culture existed as a separate cultural stratum at many sites in southern Henan, but appeared only as distinctive cultural elements (mainly pottery forms) in central Henan (Zhao Qing 1994). Dawenkou and Qujialing cultural elements were found in coexistence with late Yangshao deposits at several sites in the northern part of central Henan, including at Xishan, where a town wall enclosure was built. During the early Longshan culture period, this influence seems to have been concentrated in the lowland region of central Henan, again forming a situation in which three cultural traditions (Longshan, Dawenkou, and Qujialing) coexisted side by side.

The middle and late Dawenkou culture in Shandong (contemporary with the late Yangshao and early Longshan periods) had become stratified societies, as suggested by the hierarchical distributions of mortuary remains (see chapter 5). The Qujialing culture was also well developed, as indicated by the existence of at least five walled settlements (up to 100 ha in size) found in Hubei and Hunan (Zhang Xuehai 1994). These two cultures probably reached a higher level of social complexity than those of the late Yangshao and early Longshan cultures in the Central Plains region.

Therefore, the cultural influence they brought into the Central Plains was not limited to ceramic styles, but also involved socio-political elements which may not be easily visible in material remains. This multi-lateral interaction among complex societies not only may have caused inter-polity conflict, but also stimulated socio-political development, pushing it towards greater complexity in the central Henan region.

Settlement patterns and social organization

My analysis of Longshan settlement data reveals that the levels of settlement hierarchy during the Longshan period range from two to three, and that the rank-size curves vary from primate to convex in different geographic regions. Different combinations of environmental conditions and social organizations affected developmental pathways to complex societies. In general, these clusters exhibit two patterns of settlement systems, which may represent different forms of social organization.

Mono-centered centripetal Longshan regional systems

A three-tiered settlement hierarchy with coexisting large size regional centers is observable in the Taosi area and western Henan (Clusters 1 and 2) in environmentally circumscribed regions. Rank-size distributions of settlements from the early Taosi phase express strong primate curves, suggesting the existence of a highly integrated social system, with a territory perhaps more than 3300 km^2. This centralized settlement system conforms to the mortuary patterns which demonstrate characteristics of social hierarchy at both intra- and inter-community levels (see chapter 5). Although this system developed into two coexisting, competitive groups during the late Taosi phase, each maintained a very large center and three levels of settlement hierarchy with a territory more than 1600 km^2.

Socio-political integration paralleled rapid demographic growth, which was partially caused by an increase in population which had been forced to migrate from other areas to these already well-populated and environmentally circumscribed regions. The settlement pattern, therefore, can be characterized as a mono-centered centripetal settlement system, and represents the most complex political system on the Central Plains.

Multi-centered competing regional systems

The coexistence of multiple medium/small-size centers is seen in Clusters 3–6, which are characterized as semi- and less-circumscribed regions. The centers are distributed in a linear or scattered fashion. The sub-clusters reveal two- or three-tiered settlement hierarchies, and the rank-size distributions from these regions show convex curves, suggesting relatively low levels of integration and competing relationships between centers. This suggestion is strongly supported by the presence of rammed-earth enclosures and human sacrifice practiced at some centers particularly in the northern and central Henan regions. These walled sites in Henan date to the entire third millennium BC (Appendix 9.1), suggesting a long period of inter-group conflict there.

Another significant feature of settlement distribution is the regular spacing between sub-regional centers. The distances between central places average 44 km in the western part of north Henan and 40 km in central Henan, and the territorial sizes average 1519 km^2 for north Henan and 1256 km^2 for central Henan (Appendixes 8.4, 8.5). Regular distribution of central places, equidistance between regional centers, and similar territorial size of each polity characterize many chiefdom-level societies in other parts of the world (Earle 1976: 221; 1991c: 93; Hodder and Orton 1976: 46; Renfrew 1974), indicating inter-political competition and independence. According to Renfrew's (1975: 14) "early state module," an early complex society (equivalent to a chiefdom) consisted of a central place and associated hinterland, and fell within a restricted size range of approximately 1500 km^2 in area with a mean distance of about 40 km between the central places of neighboring modules. The 20 km radius is about one day's round-trip distance on foot, and such a spatial limit represented an organizational constraint imposed on the ability of administrative elites to control rural populations and regional political economy in chiefdom societies (Johnson 1982: 415; Spencer 1998). The locational patterns of these centers in northern and central Henan further confirm conclusions derived from the rank-size analysis, that a number of independent and competing political entities coexisted on the lowlands of the Central Plains.

The settlement pattern observed in the Yiluo cluster is similar to those in north and central Henan, and is characterized as a multi-centered settlement system. However, no walled site has been found; the distances between centers are shorter (25 km on average) and territorial sizes are smaller (491 km^2 on average), suggesting that small polities coexisted, perhaps also with competitive relationships.

In contrast to the Taosi region, no burial site with clear evidence of social stratification has been found in Clusters 3–6, suggesting lower levels of social hierarchy. Therefore, these four clusters may be categorized as multi-centered competing regional systems, and represent the region's less integrated social systems.

Discussion and conclusions

Settlement data from the Neolithic Central Plains suggest that chiefdom-level social organizations may have emerged and developed during the fourth and third millennium BC, based on criteria commonly used to measure the level of social complexity (Table 6.1). The mid-Yangshao settlement cluster in western Henan is the first example to show a hierarchical system of settlement pattern, and ritual ceremonies organized by a chief at the regional level. In the period of late Yangshao culture, inter-group conflict, suggested by the construction of rammed-earth walls at Xishan, began to take place. This may have been partially triggered by population movement from other cultures (Dawenkou and Qujialing) in the southern and eastern regions of the Central Plains.

During the Longshan period, increasing social complexity was commonly experienced in all regions, but in different patterns. The most integrated social systems occurred in regions of circumscribed conditions in the highlands, as exemplified by the early Taosi cluster. This had a large territory dominated by a big major center, marked mortuary hierarchy, long-distance exchange of elite items, and chiefly control of ceremonial power, indicated by ritual paraphernalia buried with the elite (see chapter 5). However, there were fundamental changes during the late Taosi period when the mono-centered settlement system became a multi-centered competing system. The causes and effects of these political changes need to be investigated, but they probably led to a less-centralized social organization in the region. There appears to be a discontinuity in material culture between the late Longshan culture and the following Erlitou culture, as the Erlitou material assemblages in this region were largely derived from the Yiluo basin in Henan, where the first state developed ca. 1800 BC. These phenomena suggest that the complex chiefdoms in the Taosi region may have collapsed by the end of the Longshan period, and the new social development there during the next period was the result of political expansion from an early state established elsewhere (Liu, L. and Chen 2001b, 2003).

Decentralized social organizations developed in the semi- and less-circumscribed regions of the Central Plains. Accompanied by climatic fluctuation and by the Yellow River's changing courses, the lowlands in central and northern Henan became areas in which abundant agricultural lands attracted people from surrounding regions. Intensive interaction between different social or ethnic groups led to inter-polity conflict in these areas. These competing polities were probably politically independent, based on convex rank-size curves and regularly spaced centers, and not very hierarchical in social organization, judging from medium-size central places, many with two levels of settlement hierarchy. They also did not have large territories, indicated by the regularly short distances between the centers. Internal social stratification developed, exemplified by the construction of a palatial structure at Guchengzhai (see chapter 4), but there is little evidence of mortuary hierarchy. However, it was from these decentralized chiefdom systems, with less integrated political structures, that the Erlitou and Shang states were derived.

During the Longshan culture period, the construction of rammed-earth fortifications reached unprecedented levels in size and number. These walls were probably constructed for military defense, flood control, and as symbols of political power, as discussed in chapter 4. These fortifications were built in various sizes and occurred in all regions, so it is difficult to generalize their specific functions relative to particular social and environmental conditions. Rather, their construction may have been used by elite groups as the most effective method to mobilize the population in order to create and maintain social solidarity and personal prestige at both community and regional levels.

Central places on the Central Plains vary dramatically in size. Sites in the highlands (western Henan and Taosi region) tend to be bigger than those in the lowlands (central and north Henan, and Yiluo region). This may be due to the types of residential structures associated with different topographic conditions. Cave shelters, subterranean and semi-subterranean houses were the most common residential structures on the loess plateau regions. A village with cave shelters tends to spread out over a large area, since the lifespan of earth shelters is short and residents need to periodically dig new caves in different locations. Similarly, rebuilding subterranean houses also requires a large area of land. In contrast, villages in lowlands often have houses built at ground level, and houses rebuilt at the same location over long periods of time. For example, the Yangshao sites in western Henan appear to have rather thin cultural deposits, mostly less than 2 m in thickness (Henan Institute and Institute of Archaeology 1999), and few houses were found superimposed on each other (Ma Xiaolin 2003, personal communication). However, the Longshan strata at Kangjia measured more than 4 m, formed by more than ten layers of superimposed house floors (see chapter 3). Therefore, the population density in lowland settlements may have been much higher than the population density of highland settlements. Taking depositional processes into consideration, we should not expect that the large Yangshao settlements in western Henan had large populations, and the Taosi population may not be as suggested by site size alone.

According to the evolutionary model described earlier in this chapter (Table 6.1), complex societies developed from simple to complex chiefdoms, and finally to states. The Yangshao settlement patterns from western Henan and Zhengzhou may be described as simple chiefdoms, with relatively small territorial size and mostly two-tiered settlement hierarchy in each polity. The social systems of the Longshan culture seem to include both simple and complex chiefdoms, with two to three levels of settlement hierarchy and various sizes of territory (Appendix 10.1). The polities in the Taosi area appear to have been the most developed chiefdoms; however, they did not further develop into a higher level of political organization. Interestingly, it is the less complex variation of social systems, the scattered multi-centered competing systems in central Henan and the Yiluo region, where the Erlitou culture developed, that gave rise to early states. This competing settlement pattern, occurring on the eve of the emergence of states, seems to best resemble the scenario of "ten thousand states," said by ancient texts to have existed prior to the Xia dynasty, as cited at the beginning of this chapter.

7

Development and decline of social complexity beyond the Central Plains

> From the perspective of historical geography, it now can be argued that, during the Three Dynasties and predynastic period, there were two [cultural] systems [in China], one in the east and one in the west. These two systems confronted, competed, and interacted with each other, and then developed culturally. The Yi and Shang belonged to the eastern system, while the Xia and Zhou were the western system.
>
> "Yi Xia dongxishou" Fu Sinian (1933)

Introduction

The above statement made in the 1930s by Fu Sinian was based on traditional textual records rather than archaeological evidence. Whether or not these two assumed cultural systems existed during prehistory and the early dynastic period is questionable, since the texts referred to by Fu were written thousands of years after the Neolithic period. However, there were indeed differentiations in geographic configuration and material cultural traditions between the east and west regions along the Yellow River valley during the Neolithic period. This chapter examines the Longshan settlement patterns of two regions beyond the Central Plains, Shandong in the east and central Shaanxi in the west. Both regions witnessed the development of early complex societies, yet did not evolve into state-level societies through their own internal dynamics. It is hoped that the study of these cases will provide a deeper understanding of the processes which drove the development and decline of social complexity. By comparing these cases with those of the Central Plains, where early states did emerge, it is possible to ascertain the conditions required for the development of early states in China.

The data used in this chapter for the analysis of settlement patterns are derived from regional survey reports, including those generated by recent full-coverage surveys in the Rizhao region, Shandong, and from traditional surveys carried out by Chinese archaeologists over the past fifty years. The quantities of these survey reports vary significantly, and problems with reports of traditional surveys stem from limitations of the spatial and temporal coverage of these studies, as discussed in chapter 6. In order to overcome these deficiencies, I will examine the settlement distribution of those areas from which reasonably detailed survey data have been published. For the Shandong region, survey reports published since the 1960s provide settlement data covering more than thirty counties/cities (about 50,000 km^2 in area) (Appendix 11.1). For the central Shaanxi region (about 39,000 km^2 in area), the newly published Shaanxi volume of the Atlas of Chinese Cultural Relics (National Bureau 1999) is the major source of information.

Analytical methods similar to those used in chapter 6 are applied here. A general comparison of site size at the regional level is conducted. The settlement hierarchy in the sub-regions is discussed, and the levels of hierarchy are defined by natural breaks shown in histograms of settlement-size distribution within the sub-region in question. Rank-size analysis is also applied to most sub-regions. The settlement information, finally, is analyzed in the light of environmental changes and relationships with surrounding cultures. I will mainly focus on the Longshan period in these two regions in my discussion, since the settlement data for earlier periods are limited.

Regional settlement patterns in Shandong

Shandong, meaning "East of the [Taihang] Mountains," includes two principal types of topographic configuration: (1) two highland regions, and (2) the surrounding plains. Central Shandong is dominated by the Taiyi mountain system. Several major mountains – Tai, Meng, Lu, and Yi, of more than 1000 m in elevation, are located in the center of the region. On the eastern Shandong peninsula, there is a hilly region with average elevations of 200 to 500 m; and the highest mountain there is Mount Lao (1133 m). As for the plains, these are mostly formed by the drainage of several major rivers, and incorporate the highland systems. Major plains include those on the north and west sides of the Taiyi mountain system, and also the Jiaolai plains situated between the two highland regions. The greater part of the plain regions is lower than 50 m in elevation (Xu Meiyu 1992: 67).

The environment and topographic configurations of this area in ancient times were quite different from those at present. As discussed in chapter 2, during the Middle Holocene optimum several climatic fluctuations may have occurred, which correlated with other geomorphic changes in the region. These include changes in sea elevation, leading to marine transgression in coastal areas in the Bohai Bay and northern Jiangsu (Wang Qing and Li 1992; Zhao Xitao 1984: 178–194); shifts in the Yellow River's lower course back and forth between north (in Hebei) and south (in western Shandong and northern Jiangsu) around the third millennium BC (Wang Qing 1993); and changes in the size of fresh water areas in regions with low elevation, especially on the western Shandong plains (Gao Guangren 1996). These changes in climate and geographic configurations affected settlement patterns as well as cultural development in ancient times.

Houli, Beixin, and Dawenkou settlements

The earliest Neolithic culture in Shandong, the Houli culture (ca. 6500–5500 BC), has only been recognized in recent years, from a dozen sites on the alluvial plains north and south of the Taiyi Mountains. From the following Beixin culture period (ca. 5300–4100 BC), more than fifty sites have also been found, and they were distributed over a broader area. The Dawenkou culture (ca. 4100–2600 BC) experienced the first significant population growth, and its sites are spread over an even larger region, including Shandong, eastern Henan, northern Anhui, and northern Jiangsu (Luan 1997c: 1–68). Although no accurate figure for the number of Dawenkou sites in the region has been published, based on our samples derived from more than 30 counties/cities, some 217 Dawenkou sites have been found, compared to 16 sites dated to the previous period of the Beixin culture (Appendix 11.1). The three earliest walled settlements in Shandong were constructed during the Dawenkou period, Xikangliu (3.5 ha) in Tengzhou, Wangzhuang (4 ha) in Yanggu (Zhang Xuehai 1996b), and Dantu (9.5 ha) in Wulian (Shandong Institute 2001) (Figure 6.8). During the Longshan period (ca. 2600–2000 BC), the number of settlements increased to an unprecedented level. More than 893 sites have been found in the sampling area, about four times the number for the Dawenkou period. The Dawenkou culture spanned 1,500 years, but the time span for the Longshan culture was only 600 years, and consequently its rate of population increase was even greater. The largest Longshan site covers 246 ha (Liangchengzhen), and walled enclosures became more prevalent during the Longshan period, some of which were built on the location of Dawenkou walled settlements. However, this trend of rapid development appears to have ended during the following Yueshi culture period, indicated by a marked reduction in site numbers, to 14 percent of those of the Longshan period, based on our samples (Appendix 11.1).

Longshan settlements

The following discussion will focus on settlement distribution during the Longshan period. A total of 379 sites (232 Longshan-only and 147 multi-component) are examined, and the analysis of settlement hierarchy is primarily based on the distribution of Longshan-only sites. In order to make the data comparable to the information from the Central Plains, the same classification of site sizes used in chapter 6 is also employed here; sites measuring 20 ha or more or associated with walled enclosures are shown in Figure 6.8. In the Shandong region, there are 1 very large site (246 ha), 2 large sites (75 ha and 130 ha), and 19 medium sites (20–50 ha), some of which are walled settlements. 14 walled sites, the sizes of which range from 3 to 38 ha, have been found in Shandong.

There are four settlement clusters observable in this region, all distributed on the alluvial plains around highland regions. These are, the Linyi cluster in southern Shandong (C7), the Rizhao cluster in southeastern Shandong (C8), the northern Shandong cluster (C9), and the western Shandong cluster (C10).

Cluster 7 – the Linyi region Linyi, covering an area of 1751 km^2, is located on riverine plains to the south of the Taiyi Mountian system. Because of rich natural resources, fertile land and the three drainage systems of the Yi, Shu, and Fang rivers, these areas had suitable environmental conditions for Neolithic settlers, and became heavily populated during the Longshan period. According to archaeological surveys, the number of sites increased from 19, during the Dawenkou period, to 113, during the Longshan period (Linyi City Museum 1992), demonstrating rapid population growth.

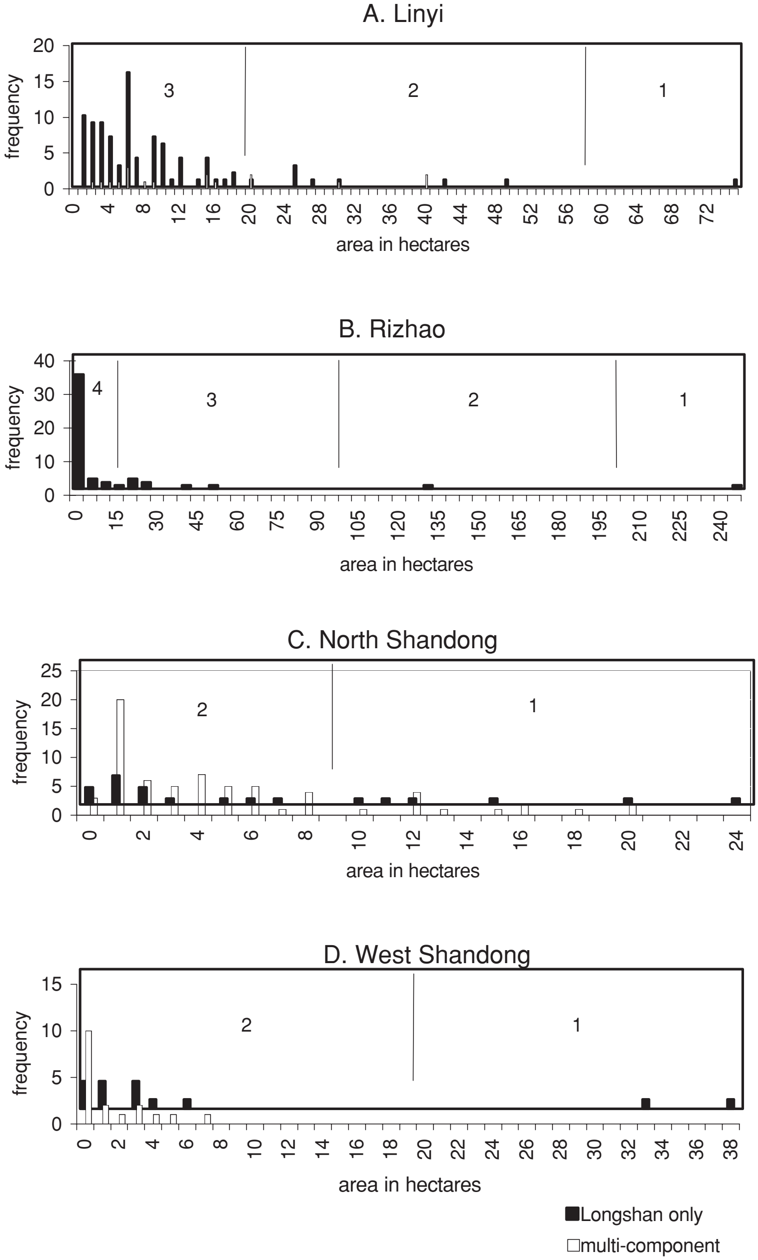


Figure 7.1 Histograms showing settlement hierarchies from site clusters in Shandong (A) Linyi: three levels; (B) Rizhao: four levels; (C) north Shandong (Dinggong and Bianxianwang): two levels; and (D) west Shandong: two levels.

The sizes of Longshan sites range from 1 to 75 ha, and the histogram shows a three-tiered settlement hierarchy (Figure 7.1A), including 1 first-rank site (75 ha), 8 second-rank sites (20 to 49 ha), and 66 villages (1 to 18 ha). These sites tend to be grouped into two sub-clusters; in the eastern group the major center at

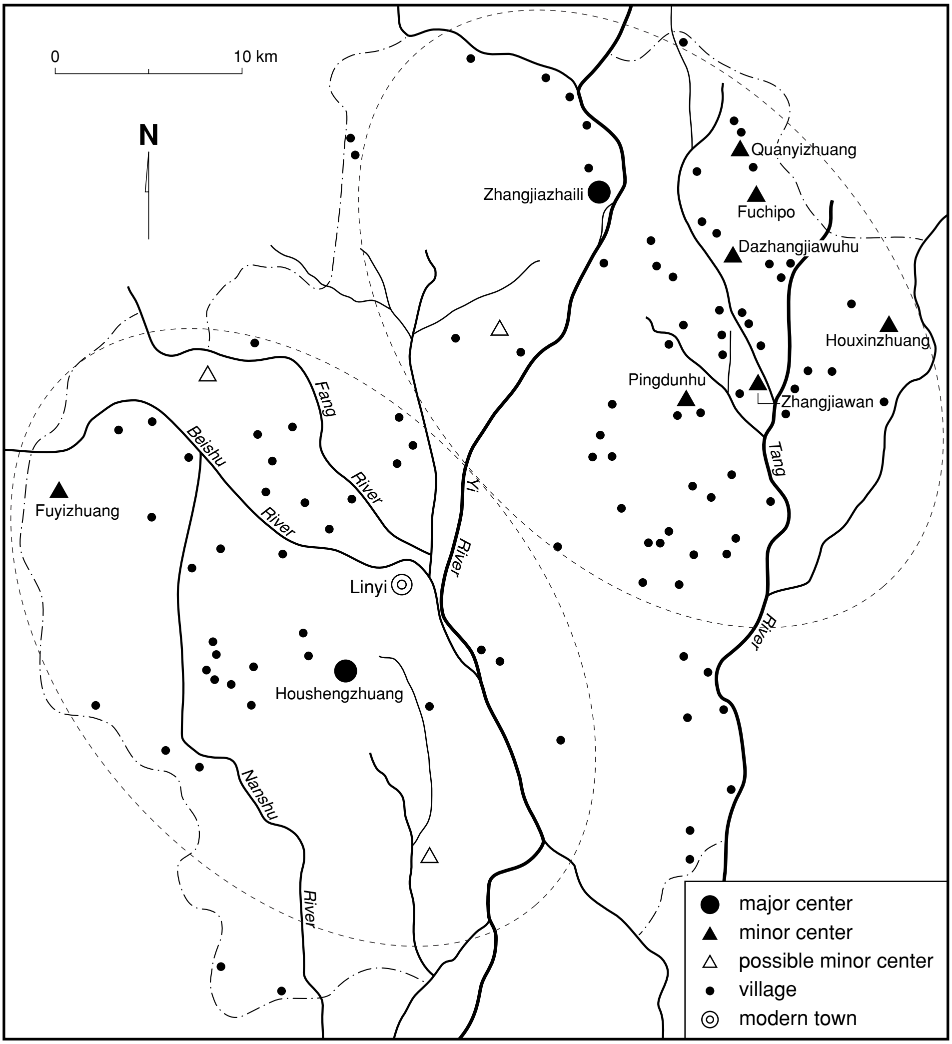


Figure 7.2 Distribution of Longshan sites in the Linyi cluster, Shandong (adapted from Linyi City Museum 1992: fig. 1).

Zhangjiazhaili (75 ha) is closely clustered with several minor centers and many villages, while in the western group Houshengzhuang (42 ha) and Fuyizhuang (25 ha) may have been the major and minor centers (Figure 7.2). The rank-size curve shows a convex distribution but close to log-normality (Figure 7.3A). These data suggest that although settlement integration is evident based on the development of a three-tiered site hierarchy, the largest settlement at Zhangjiazhaili probably did not dominate the entire river valley. The distance between the centers of these two sub-clusters is 30 km. If each sub-cluster represents a relatively autonomous polity, the catchment area for each polity would be estimated as 960 km^2 or slightly larger (Appendix 8.6).

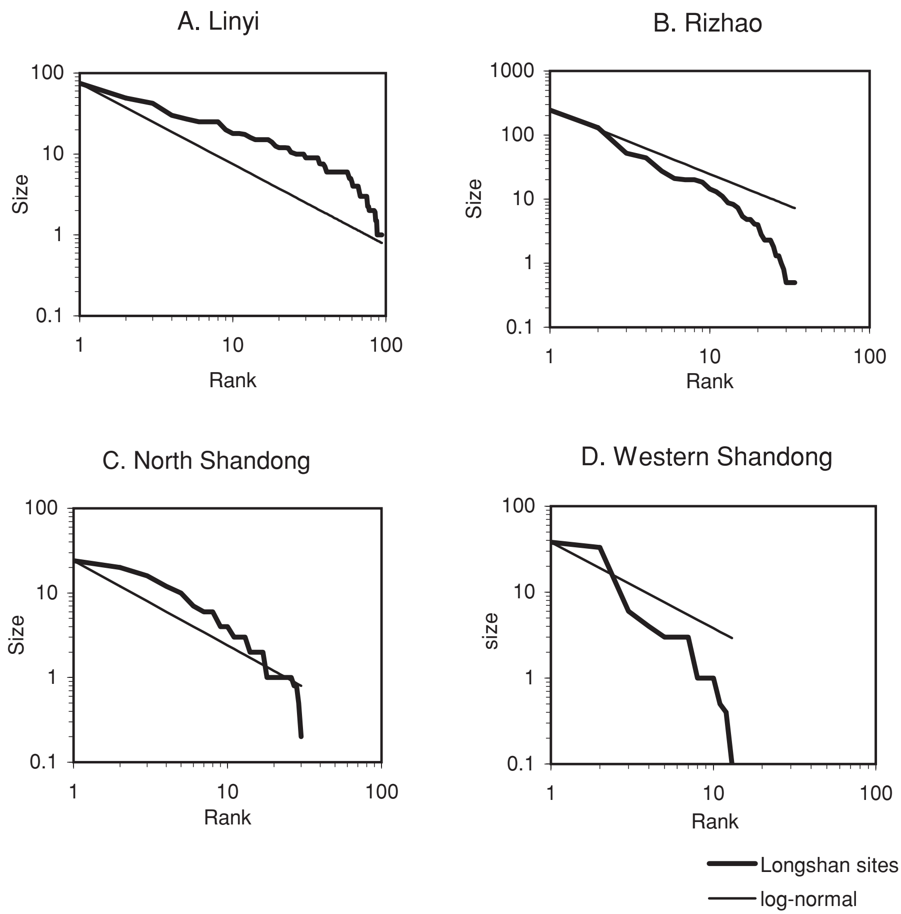


Figure 7.3 Rank-size distributions from site clusters in Shandong, (A) Linyi: convex; (B) Rizhao: log-normal; (C) north Shandong: convex; and (D) west Shandong: convex.

In order to explain the rapid population growth of the Linyi cluster, we need to understand the environmental and demographic conditions of the broader region. Linyi is located near the northern border of Jiangsu province, and the rapid increase of population from Dawenkou to Longshan periods in the Linyi region coincided with the decline of site numbers in northern Jiangsu. Northern Jiangsu is a region where Neolithic remains (dating from ca. 5000 to 2000 BC) shared similarities with contemporary cultures in Shandong. It is also an area with very low elevation (lower than 2 m above the sea level in some areas), and it has often been subject to inundation caused by marine transgression and by flooding of the Yellow River (Wang Qing 1993: 68; Wu Jianmin 1990: 243). A study of the archaeological site distribution there suggests that during the Neolithic period this region witnessed three intervals of population decline (Wu Jianmin 1990). Geologists have detected three periods of marine transgression in this region, which pushed the coastline as much as 100 km to the west of the present coastline (Zhao Xitao 1993: 38–39)

Table 7.1 *Change in site distribution corresponding with marine transgressions in northern Jiangsu*

	Archaeological data*		Marine transgression		
Culture	Time (BC)	No. of sites	Sea level	Uncal. BP	Cal. BC
Qingliangang/ Beixin	500–4000	20	low		
Liulin/ Early Dawenkou	4100–3500	11	high + 2–4 m	6000–5000	5250–2650
Mid-Dawenkou	3500–3000	14	low		
Late Dawenkou-Early Longshan	3000–2300	0	high + 1–2 m	4600–4000	3650–2200
Late Longshan	2300–2000	30	low		
Yueshi	1900–1500	7	high + 1–3 m	3800–3100	2470–1120

* Settlement data based on Wu Jianmin 1990. However, the dates of Dawenkou, Longshan, and Yushi used in Wu's article are different from the ones now conventionally agreed by most archaeologists. I employ the latter in this study.

(Figures 2.1, 2.6). A period of absence of sites during the late Dawenkou and early Longshan periods (ca. 3000–2300 BC) coincides with the second high-sea-level episode (4,600–4,000 BP, or 3650–2200 cal. BC) (Table 7.1).

The site-absent interval dated to the late Dawenkou and early Longshan periods was also contemporaneous with the changing course of the Yellow River from north to south during the late Neolithic period. The lower course of the river then ran through northern Jiangsu and may have also caused flooding, endangering the region's Neolithic settlers (Wang Qing 1993: 68). The incidence of inundation in northern Jiangsu, caused by the marine transgression and the Yellow River's flooding, may have triggered population migration from the inundated areas into more habitable locations on higher ground in the neighboring regions. Linyi, on the periphery of the Taiyi Mountain system and with rather high elevation, would have been one such region. Population movement caused by environmental changes at the beginning of the Longshan period therefore was likely to be one of the major factors which contributed to the dramatic increase in the number of sites and the settlement integration observed in the Linyi region.

It is notable that a walled site was found at Tenghualuo near Lianyungang in northern Jiangsu (Figure 6.8: W18), about 70 km southeast of the Linyi area. Two layers of rammed-earth enclosures, 4 ha and 17 ha, were constructed in the early Longshan phase, and the site was abandoned at the end of the middle Longshan phase (Lin *et al.* 2000). This walled settlement may not have been an isolated case in this region, and the relationship between regional centers was probably competitive.

Cluster 8 – the Rizhao region Cluster 8 is a group of sites distributed across Rizhao city and southern Wulian county in Shandong. This region is a narrow coastal plain, lying along an extended north–south axis, between the Yellow Sea in the east and inland hills in the west (Figure 6.8). Recently a full-coverage regional survey project of this area has been carried out by the Sino-American Collaborative Liangcheng Archaeology Team, which has made an extremely important contribution to our understanding of the area's socio-political development. According to the results of this project, the earliest Neolithic settlements date to the Dawenkou period. Within a survey area of 400 km^2, only four Dawenkou sites have been found (Underhill *et al.* 2002); but one of them, Dantu (9.5 ha), is a walled settlement (Shandong Institute 2001). The function of this enclosure needs to be investigated; however, it is unlikely that it was a defensive fortification since settlement density was extremely low during the Dawenkou period.

This survey project has located 199 Longshan settlements (Figure 7.4). Although the settlement data from the survey project have not been fully published, based on available information, a four tiered-settlement hierarchy is visible (Figure 7.1B): (1) Liangchengzhen (246.8 ha) was the regional center; (2) Dantu (130.7 ha) was the secondary center; (3) 13 sites ranging from 52.1 ha to 10 ha were third-level settlements; and (4) 184 small sites, 8.7 ha or smaller were the villages. The regional settlement distribution shows six site groups, among which the Liangchengzhen group is situated in the center, manifesting more tiers of site hierarchy and larger settlement occupation area than all surrounding groups (Sino-American Collaborative Liangcheng 1997; Underhill *et al.* 2002). The rank-size distribution of sites shows a curve very close to log-normality (Figure 7.3B). These patterns suggest that the Rizhao settlement cluster represents a hierarchically organized and economically integrated political system.

As discussed in chapter 4, Liangchengzhen is the largest site yet found in Shandong; it has some important features, such as rammed-earth deposits, two pits full of jade scrap and artifacts, and a large quantity of tools and pottery. Traits demonstrating the production of utilitarian goods (e.g., stone tools) and prestige items (e.g., jades) have been identified at the site. Liangchengzhen probably functioned, not only as a political center, but also as a regional center for the production and distribution of certain types of craft products.

Dantu is located about 4.5 km northwest of, and is partially contemporary with, Liangchengzhen. After the Dawenkou period people continued to enlarge the rammed-earth enclosures at this site. Two more enclosures of different sizes have been found at the site, dating to the early Longshan (11 ha) and late Longshan (18 ha) periods (Shandong Institute 2001). Currently there is no satisfactory explanation about the function of this secondary center in relation to Liangchengzhen, nor for why rammed-earth enclosures have been found at Dantu but not at Liangchengzhen. Current ongoing excavations at these two sites will increase our understanding of their relationships.

A third-level site, Xiangjiagou (20 ha), is also noteworthy. It is located south of Liangchengzhen on the northern slope of Mount Zhuzu, and was occupied by

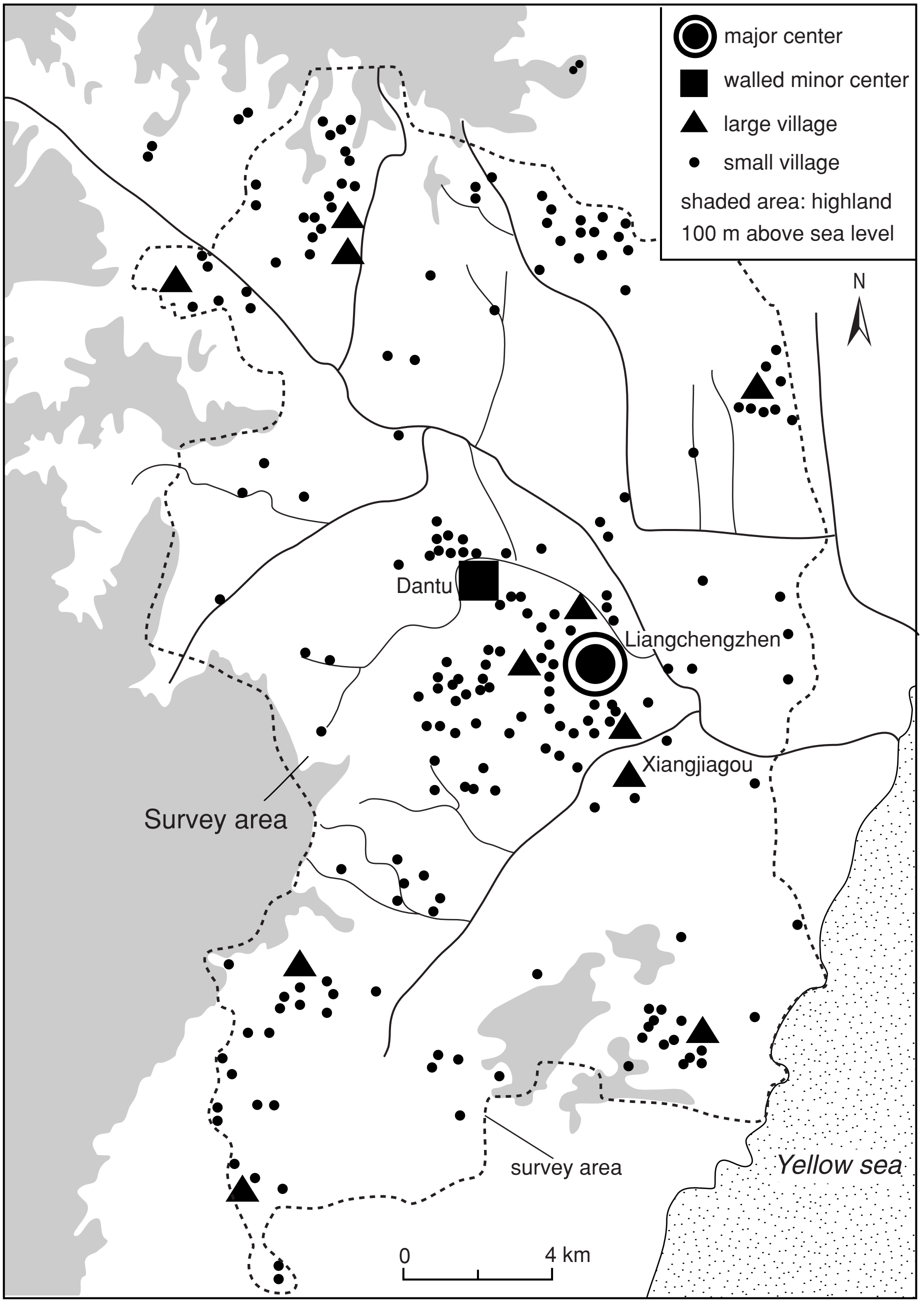


Figure 7.4 Distribution of major Longshan sites in the Rizhao cluster, Shandong (adapted from Underhill *et al.* 2002: fig. 2).

people for a long period of time (spanning Longshan, Zhou, and Han periods). The location of the settlement on the northern slope seems contradictory to the southward residential orientation, which has long been employed in the region. This phenomenon indicates that the site may have had a special function. Mount Zhuzu is a place where local people performed rituals for ocean-spirit worship in ancient times, and an ocean-spirit temple still existed there until a few decades ago. It is possible that this tradition was already practiced during the Longshan period (Sino-American Collaborative Liangcheng 1997: 4), and Xiangjiagou may have been a minor regional center due to its religious significance.

The Liangchengzhen cluster seems to have formed a network of settlements, where production and redistribution of both elite goods and utilitarian items and, perhaps, religious activities, may have operated as part of a complex system of social organization. Given the scale of Liangchengzhen and Dantu, the socio-political importance of this cluster may not be limited to the local level. It is still difficult to estimate the catchment area of the Liangcheng cluster, since the survey project has yet to cover the entire region.

This area was only sparsely populated prior to the Longshan period and most Longshan sites are dated to the early and middle phases of the Longshan period (Underhill *et al.* 1998: 463). Thus the Longshan settlement nucleation appears to have happened rather rapidly. Similar to the Linyi region, rapid demographic growth during the Longshan period in the Rizhao region may be partially attributable to population migration from other areas such as northern Jiangsu.

Furthermore, Liangchengzhen is situated near the Liangcheng River which discharges into the Eastern Sea within a short distance. This location may have been chosen for its suitability for marine transportation. Cultural interactions between Neolithic peoples throughout the coastal regions have been documented in the archaeological record, and marine transportation would have been employed by then (Luan 1996b; Wang Qing 1995). Easy access to lithic resources and convenient transportation may have encouraged the development of other craft production, which, in turn, led to the population increase, and to the formation of hierarchical settlement systems. As discussed in chapters 4 and 6, several regional centers in Henan and Shanxi (such as Wangchenggang and Taosi) were engaged in stone-tool production, so it is not surprising to see that the largest regional center in Shandong was also involved in this craft specialization. Given the significance of stone tools during the Neolithic period, the lithic resources and technology of making the tools must have been important assets for economic competition and control of a region.

Between the Longshan period, and until the beginning of the Zhou dynasty (ca. 2000–1100 BC), there seems to have been a long period of population decline, if not depopulation, since only a few sherds from the Yueshi culture have been identified at six sites by the Liangcheng Archaeology Team (Underhill *et al.* 2002). The disappearance of sites after the Longshan period apparently coincided with a shift of political centers to western Shandong and Henan (Underhill *et al.* 1998: 468), but the causes for the decline of the Longshan culture in this region need to be investigated further. The decline may have partially resulted from severe environmental changes, as discussed earlier, for example, climatic fluctuation, flooding river systems, and marine transgression. Since reduction of site numbers after the Longshan period was a common phenomenon across the Shandong region, the causes may have been complex, and have included both social and environmental factors (see below).

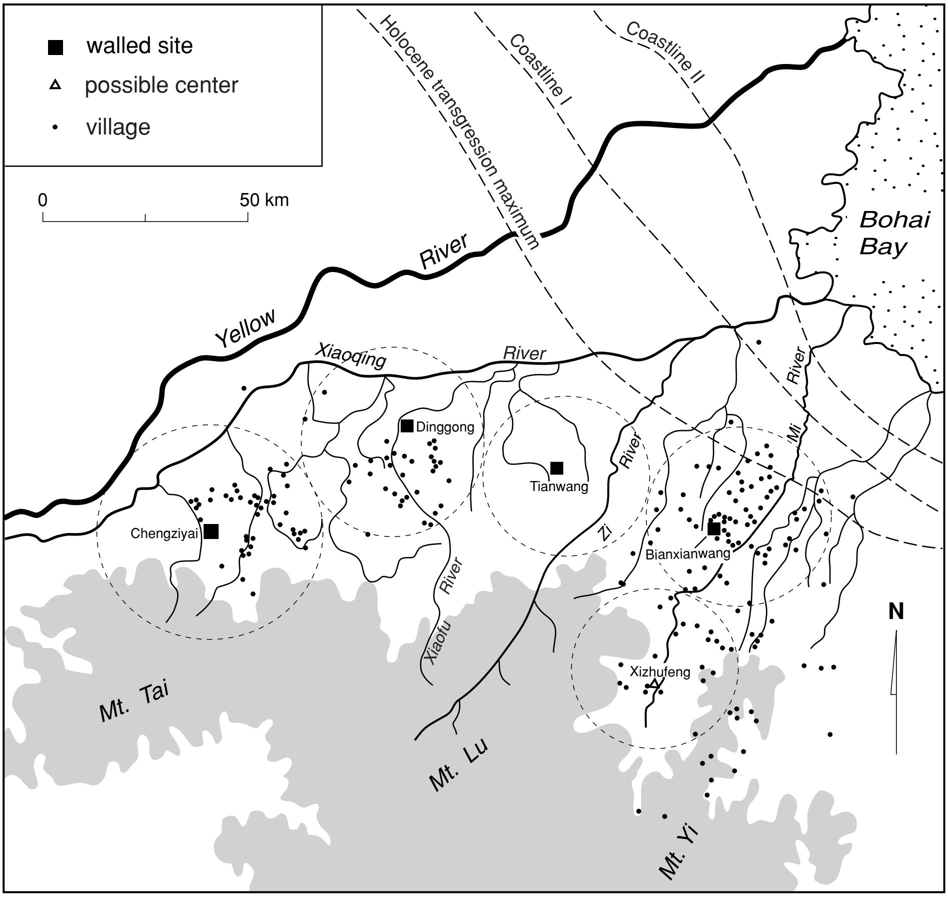


Figure 7.5 Distribution of four Longshan walled sites and small village sites in the north Shandong cluster; noting that small sites in the Tianwang area are missing due to the lack of settlement data. The distribution of Longshan sites is compared with the positions of coastlines. Holocene transgression maximum: 7,000–6,000 BP [6010–4650 cal. BC]; Coastline I: 5,000–4,700 BP [3960–3300 cal. BC]; Coastline II: 3,500–2,500 BP [2040–400 cal. BC] (Positions and dates of coastlines based on Zhao Xitao 1996: 60).

Cluster 9 – the northern Shandong region Cluster 9 is in northern Shandong, and roughly includes Zhangqiu, Zouping, Guangrao, Linzi, Shouguang, Qingzhou, Changle, Weixian, and Weifang cities/counties. This region forms a long linear zone on an east–west axis, where the mountainous area of mid-Shandong joins the plain of northern Shandong. Several rivers, along with many smaller tributaries, run from west to east or from south to north, and all empty into the Bohai Bay (Figure 7.5). This region's soil is thick and rich, and its land is flat, at an elevation less than 50 m. In the south, the land is hilly, but there are abundant fresh water supplies, terraces along rivers, and small-scale flatlands (Du 1986).

The northern Shandong region experienced a long history of cultural development. The earliest Neolithic occupations were by the Houli culture, and cultural development continued from the Neolithic to the Bronze Age. Major population growth, however, seems to have occurred during the Longshan period – site numbers increased more than 300 percent when Dawenkou sites (76) are compared to Longshan sites (306) in the sampling area (Appendix 11.1). Most Dawenkou sites are found further inland, as much of the coastal region was submerged by the seawater during a high sea-level period in the fourth millennium BC. Longshan sites are both densely distributed and covered a broader region. This is probably because the coastline had retreated further in the circum-Bohai region during this period, creating a large area of new land for Longshan settlers (Figure 7.5).

Four walled Longshan settlements have been identified here, and each appears to have functioned as the sub-regional center associated with a cluster of small sites, forming multiple polities in this region. These centers are Chengziyai in Zhangqiu, Dinggong in Zouping, Tianwang in Linzi, and Bianxianwang in Shouguang (Figure 7.5). Settlement data from this region are poorly documented, and my analysis is mainly based on data from excavated large centers and settlement information from Dinggong and Bianxianwang sub-clusters. The histogram shows a two-tiered site hierarchy (Figure 7.1C), and the rank-size curve is convex (Figure 7.3C), suggesting low levels of inter-polity integration in this region.

Chengziyai has several layers of rammed-earth enclosures, constructed during the Longshan, Yueshi, and Zhou periods. The Longshan enclosure (20 ha) was built in the early phase and lasted throughout the entire Longshan period. More than 40 Longshan sites, measuring 6 ha or smaller, were found in this region (Figure 7.5) (Jinan City 1989; Zhang Xuehai 1993a, b). Detailed site-size data have not been published, but it is likely that a two-tier settlement hierarchy existed.

Dinggong, surrounded by more than 30 small Longshan sites, is located near the Xiaofu River in the northeast of Zouping county. A walled enclosure and a large ditch were discovered around the site. The walls, initially constructed before the mid-Longshan period, encircled an area of 11 ha, and enclosed cultural deposits some 3 m thick, covering the entire Longshan period (Shandong University 1989, 1993; Zhang Xuehai 1993b).

A sherd carved with an inscription of eleven characters (Figure 7.6) was found in a Longshan pit (Shandong University 1993), a discovery that triggered debates regarding its significance and meaning. While some scholars are doubtful about attributing a Neolithic date to the inscription (e.g., Ming 1993; Wang, E. *et al.* 1993), others believe that the characters were written by the Longshan people (e.g., Feng 1994). If this inscription proves to be evidence of a lost ancient script, the writing system is completely different from the Shang inscriptions on oracle bones. Some scholars have attempted to decipher the script, but with no consensus as to their meaning (Luan 1996a: 225–226).

Tianwang, located on a terrace between two rivers to the northwest of Linzi, has a rectangular-shaped rammed-earth enclosure, enclosing 15 ha, which was built no later than the middle Longshan period. Longshan deposits at the site were as thick as 3 m, Dawenkou deposits were found in the lower strata, and Yueshi and Zhou town walls were discovered in the upper strata (Zhang Xuehai 1993b). A set of Longshan pottery ritual vessels, including 7 *ding* tripods, 3 *yan* steamers, 4 *gui* pitchers, and

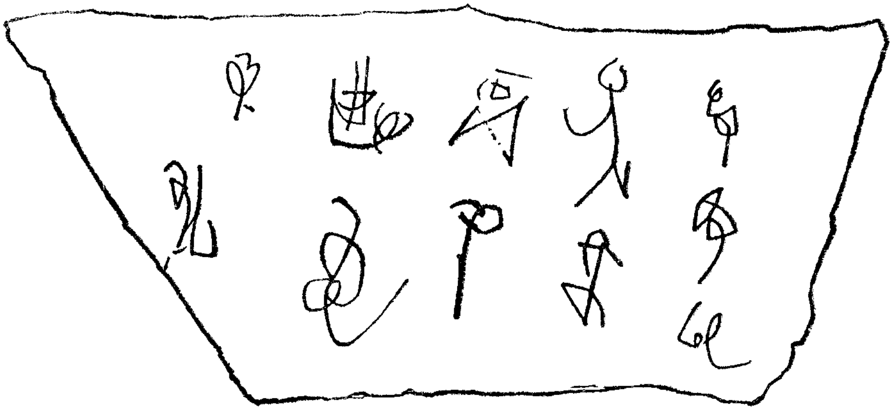


Figure 7.6 The pottery sherd incised with eleven characters from Dinggong in Shandong, Longshan culture (adapted from Feng 1994: fig. 1).

3 *pen* basins, were discovered in a sacrificial pit. One of the *yan* steamers is the largest one (1.16 m high) of its type to be found in Shandong (Zhang 1996b: 42). This points to some ritual function for the site.

In the surrounding area in Linzi and Guangrao, at least 17 Longshan sites have been found (Wei Chengmin 1993), but detailed information about site size and distribution in this area has not been published.

Bianxianwang is also located on a terrace between two rivers to the southwest of Shouguang county in the Mi River valley. Here two enclosures were found: a small one (1 ha), built during the mid-Longshan period, enclosed by a larger one (5.7 ha), constructed in the late Longshan (Wei Chengmin 1993; Zhang Xuehai 1993b). Under the foundation of the large enclosure, 11 foundation-laying pits were excavated, in which human, pig and dog skeletal remains were found (Yan 1985:16). Longshan sites in the surrounding area of Bianxianwang along the Mi River valley are densely distributed, 62 sites in Shouguang (Shouguang County Museum 1989), 76 sites in Qingzhou (Qingzhou City Museum 1989), 60 sites in Changle (Weifang City Museum 1987), and 36 sites in Linqu (Shandong Institute 1989b) (Figure 7.5). Unfortunately, the survey data from these areas have not been published fully.[8] Based on available information, Bianxianwang was probably not the only center in this sub-region. At least one site (24 ha), much larger than Bianxianwang, has been identified in Qingzhou, but its location was unmarked in the original report (Qingzhou City Museum 1989). Another site, Xizhufeng (remaining size of 5.4 ha) in Linqu, about 38 km southeast of Bianxianwang, may have also been a center. At Xizhufeng, excavations yielded three of the most elaborately furnished tombs among all Longshan burials found in Shandong (Shandong Institute 1989a; Shandong Team 1990), indicating the existence of an elite social group (Liu, L. 1996a).

These five centers have a linear distribution. The distances between them are 53, 36, 40, and 40 km, with an average distance apart of 42 km and an average catchment area of 1384 km^2 (Appendix 8.6). Such distribution of centers was probably the result of the topographic configuration of this region – a narrow alluvial zone located between ocean and mountains. This linear settlement distribution and average catchment area are similar to those in the western section of north Henan (Appendix 8.4), suggesting inter-polity competition.

Rammed-earth walls found in this region are of two kinds. In the first type, a natural terrace served as the base of the settlement, which was commonly surrounded by a river or cliff, with enclosures built along the edges of the cliff; this was a relatively early form of walled enclosure. The second type of wall was built on flat ground, the type of walled enclosure most commonly seen from the Longshan and the Three Dynasties periods, and represents a later form of wall construction. The Chengziyai, Dinggong, and Tianwang walls belong to the first type, and the Bianxianwang wall belongs to the second type (Zhang Xuehai 1993b). Based on the differences in construction design and radiocarbon dates, it seems that the four walled settlements were built at different times, ranging from the early to the late Longshan periods (Appendix 8.6), perhaps reflecting the gradually intensified competition between political centers in this region. This suggestion of inter-polity conflict is supported by the evidence of human sacrifice found under the foundation of the Bianxianwang wall.

Cluster 10 – the western Shandong region Cluster 10 appears in the western Shandong region and includes Guyang, Dong'a, and Renping counties. Some 32 Longshan period settlements have been found on the northwestern side of the Yellow River, which probably followed the lower course of the Ji River in ancient times.[9] Among these settlements, two medium sites are walled; six small sites (3 to 6 ha) may have also been built with rammed-earth enclosures, although this needs further investigation. The rest of the sites (<1 to 7 ha) are small villages (Shandong Institute 1995, 1997b; Zhang 1996b; Zhao Naiguang and Guo 1991) and tend to be clustered into two groups. In the north, more than twenty sites are distributed over an area around a walled site, Jiaochangpu. In the south, six sites are closely spaced around another central walled site, Jingyanggang (Figure 7.7). Jiaochangpu is about 105 km southeast of Chengziyai in the northern Shandong cluster, with the Yellow River (the Ji River in ancient times) flowing through the middle.

Two levels of settlement hierarchy are clearly shown in the histogram (Figure 7.1D). However, considering the possible existence of the small walled sites as second level centers, we would expect to see a three-tier settlement hierarchy. The rank-size distribution shows a convex line on the upper part of the curve (Figure 7.3D).

The Jiaochangpu enclosure (33 ha) was built during the Longshan period and rebuilt during the Yueshi and Shang periods. Inside its enclosure, two earthen platforms (14 ha and 1.6 ha) were found. Recent excavations of one of the platforms have unearthed houses, kilns, and sacrificial pits containing human and animal remains, and large quantities of pottery vessels. One of the human sacrificial victims was an adult male, who appears to have been tied up before his death, and a bone knife was found embedded between his clavicle and cervical vertebra (Jia and Zhou 2001).

The Jingyanggang enclosure (38 ha) was built in rectangular shape with round corners. The remaining walls are 10.5 to 12.5 m wide at the top, 19 to 20.5 m wide at the base, and 2 to 3 m high. It is the largest walled site built by the Shandong

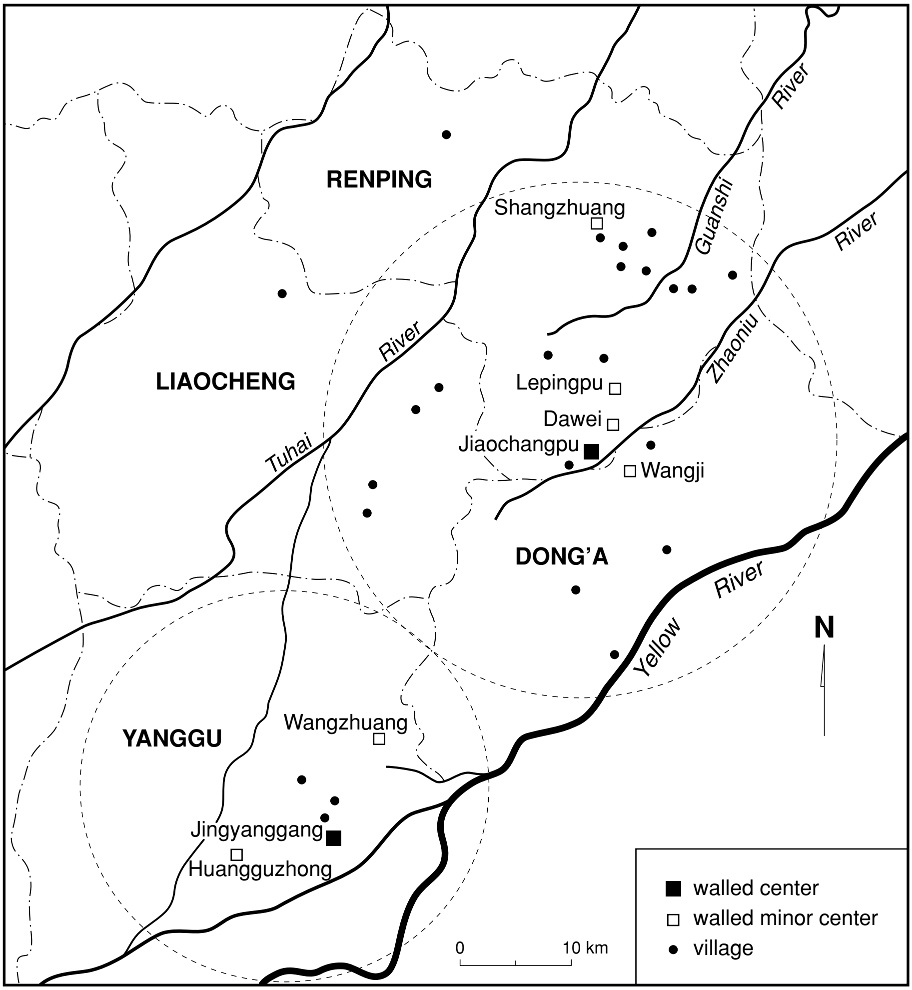


Figure 7.7 Distribution of Longshan sites in the western Shandong cluster (adapted from Zhao Naiguang and Guo 1991: fig. 1; Shandong Institute 1995: fig. 1).

Longshan culture. The walls appear to have been rebuilt several times after its initial construction. Two earthen platforms, one large (9 ha) and one small (1 ha), made of sandy soil 0.7 to 2.5 m in height and 15 m apart, were found inside the walled enclosure. A large area of rammed earth was found between the two platforms. The small platform was constructed with rammed earth, the excavation of which found a human skull with traces of violent injury, and several sacrificial pits containing pottery vessels, cattle, sheep, and dog skeletal remains. These features appear to have been associated with ritual practice (Shandong Institute 1995, 1997b; Wang Shougong 1996).

The distance between the two centers is about 42 km. The catchment areas for these two clusters are estimated as 1500 and 1250 km^2, respectively (Appendix 8.6). The structures of these two enclosures are similar, in that both have platforms associated with ritual sacrifice. As observed by the author in 1995, the remaining rammed-earth walls at Jingyanggang were constructed from sandy soil, the type of soil which covers the entire site. Apparently, this region was subjected to river flooding throughout prehistory and history, and the walled sites are situated along the ancient Ji River. The construction of the walls and platforms, as well as the sacrificial rituals, therefore, may have related to flood control.

Similar to the northern Shandong cluster, there was a rapid population growth during the Longshan period in western Shandong, judging from the dramatic increase in the number of settlements from 7 Dawenkou and Yangshao period sites to 32 Longshan period sites. Ceramic style in western Shandong, although possessing its own characteristics, nevertheless shares many similarities with the ceramic style of the Chengziyai variant of Shandong Longshan in the east, as well as with the typical ceramic style of Henan Longshan in the west (Luan 1997a; Wang Shougong 1996). Western Shandong, situated in an area between the Central Plains and the Shandong highland, is a transitional region where cultural interaction and intergroup conflict were likely to have taken place.

Most of the walled sites in Shandong have been discovered over the past fifteen years, and much work needs to be done before we can draw a more informative map of the walled-site distribution. Nevertheless, all the present archaeological data from burials (see chapter 5) and regional settlement patterns suggest that Shandong Longshan culture developed a high level of social complexity, a trend which had already emerged during the mid and late Dawenkou period.

Yueshi settlements

The Longshan culture in Shandong was succeeded by the Yueshi culture (ca. 1900–1500 BC), which had a different cultural style from the previous period. Increasing numbers of bronze objects, in various forms of small implements, were found at Yueshi sites (Cai 1993; Luan 1993), and a writing system similar to that of the Shang dynasty may have been employed during the late Yueshi period (Zibo City 1997).[10] There is a clear change in ceramic quality: the finely made Longshan egg-shell pottery completely disappeared and Yueshi ceramics appear to be cruder than those of the Longshan period (Luan 1996a: 288–338). No luxury items from long-distance exchange, such as jade objects, or elaborate burials have been found. It should also be noted that settlements diminished significantly in number in the Shandong region (Figure 2.5), which may indicate an overall population decline. In east coast areas such as Rizhao, for example, Yueshi period sites are extremely sparse, as revealed by the full-coverage regional survey (Underhill *et al.* 2002). However, in north Shandong, rammed-earth walls continued to be rebuilt at Chengziyai, Tianwang, and Jiaochangpu. Therefore, the Yueshi culture in the latter areas may have had a similar socio-political organization as that of the Longshan period, but lost political complexity in other areas.

Many Chinese archaeologists refer to the Yueshi culture as representing Dongyi (the Eastern Barbarian) (e.g., Luan 1996a), a group of people mentioned in ancient texts. But this interpretation is problematic. As Cohen has argued, the Dongyi as an ethnic group was a concept initially formed during the Western Zhou dynasty, which is a few hundred years later than the Yueshi culture; there is no necessary linkage between the stylistic similarity of an archaeological culture such as the Yueshi culture and the ethnic identity of a social group; and there is no evidence suggesting the existence of an ethnic group identified as Dongyi by itself and others during the Yueshi period (Cohen 2001). Archaeologically speaking, the Yueshi culture, probably comprising a number of social groups, shows a level of social complexity similar to the Longshan chiefdoms.

Regional settlement patterns in Central Shaanxi

Central Shaanxi (*Guanzhong*) is a fertile alluvial plain (about 360 km long, and 300 to 600 m in elevation) formed by the Wei River and its tributaries. The Wei River rises in Gansu, runs eastward through Shaanxi, and finally joins the Yellow River. This region has been a cultural and political center since antiquity. Beginning with the Western Zhou during the eleventh century BC at least ten dynasties have established their capitals here (Zhu 1986). The Wei River valley is bounded by the Qinling Mountains (up to 2000 m in elevation) in the south and the north Shaanxi loess plateau (800 to 1200 m in elevation) in the north. The loess plateau was probably covered by grasslands and forests in antiquity, but has suffered enormous environmental deterioration due to soil erosion caused by both climatic change and human destruction of natural vegetation throughout history. Agricultural and pastoral peoples have alternately inhabited this region, and soil erosion became particularly severe when it was farmed. With several major rivers running through the plateau carrying large amounts of silt into the Yellow River in the east and the Wei River in the south, hydraulic problems, such as flooding, occurred frequently in the lower Yellow River valley (Chen Kewei 1993; Zou 1990, 1997). These environmental conditions undoubtedly affected human habitations there.

Laoguantai and Yangshao settlements

Some 20 sites, dating to the early Neolithic period (the Laoguantai culture; ca. 6500–5000 BC), have been found in central Shaanxi province. These are mostly small agricultural villages, scattered across the landscape, except for 2 sites, Baijia and Laoguantai, each measuring 12 ha in area (Figure 7.8) (National Bureau 1999: 50–51).

During the middle Neolithic period this region became densely populated, and over 1,200 sites dating to the Yangshao culture (ca. 5000–3000 BC) have been found. This period is generally divided into three phases: early, middle, and late Yangshao. Since the published information does not provide fine-grained chronology for all Yangshao period sites, it is difficult to analyze the settlement hierarchy for each phase. However, it appears that the mid-Yangshao period (the Miaodigou phase) experienced the greatest population increase and settlement nucleation, indicated by the development of a very large site (130 ha) at Yinjiacun in Xianyang (National Bureau 1999). Late Yangshao period societies were also complex, suggested by the

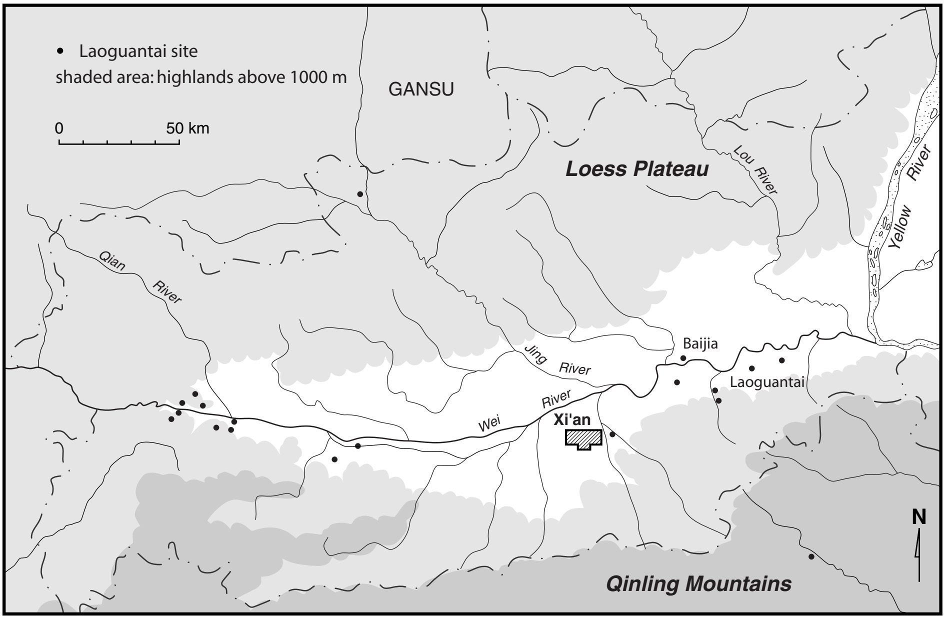


Figure 7.8 Distribution of Laoguantai sites in the Wei River valley (adapted from National Bureau 1999: 50–51).

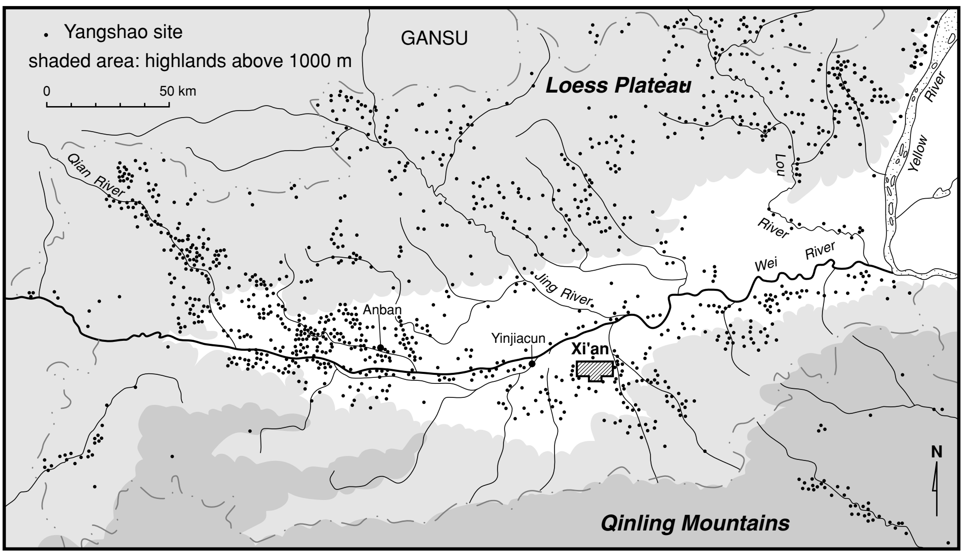


Figure 7.9 Distribution of Yangshao sites in the Wei River valley, noting that not all regional centers are marked on the map (adapted from National Bureau 1999: 52–53).

excavation results from a regional center at Anban (80 ha), centered on a large public building, used for hosting ritual activities, as discussed in chapter 4 (Figure 7.9).

During the Longshan period, there was a decline in the number and size of settlements. Some 700 Longshan sites have been found, about 58 percent of sites from the previous period. The largest Longshan site is 60 ha in area, less than half of the size of the largest center during the mid-Yangshao period. The Yangshao period was twice as long as the Longshan period, and Yangshao period sites were not all contemporaneous. In contrast to Henan and Shandong, however, where the number of Longshan sites increased dramatically, the reduction in the number of sites in central Shaanxi is still remarkable (Figure 2.5). Furthermore, archaeologists have not found any walled settlements, rich burials, or elite prestige goods (such as jade ritual items and elaborate ceramic objects) in central Shaanxi.

Longshan settlements

The Longshan culture period in Shaanxi includes two phases: early Longshan, also known as the Miaodigou II phase (3000–2500 BC), and late Longshan (2500–2000 BC). In survey reports many sites are dated to the Longshan culture without determining their sub-phases. The following discussion focuses mainly on late Longshan period sites, although detailed analysis is not possible.

Longshan sites in central Shaanxi are distributed along the tributaries of the Wei River. A total of 718 sites has been found there (355 Longshan-only and 363 multi-component), based on recent survey data (National Bureau 1999). Following the site classification presented above, there are twenty-five medium sites (19 to 60 ha), probably regional centers (Figure 6.8). These centers, together with many small sites, form four clusters; these are, the lower Wei River cluster (C11), the middle Wei River cluster (C12), the Jing River cluster (C13), and the Hancheng cluster, west of the Yellow River (C14) (Figure 7.10). For all clusters, histograms show three levels of settlement hierarchy (Figure 7.11), and rank-size curves are convex (Figure 7.12). The details about central places are listed in Appendix 7.3.

Cluster 11 – the lower Wei River cluster Cluster 11 in the lower Wei River valley covers an area including Lintong, Lantian, Weinan, Huaxian, and Huayin counties. Most sites are distributed to the south of the Wei River, and very few have been found to the north of the river. This region is the lowest in altitude (330 to 500 m) on the central Shaanxi plains. Throughout history, the lower course of the Wei River has shifted on a north–south axis (Duan and Zhou 1991), and the middle course of the Yellow River has moved on an east–west axis (Zou 1990: 81–86). Part of the landscape to the west of the Yellow River and to the north of the lower Wei River is characterized by sand dunes formed by wind-blown sand which drifted from abandoned river courses. Based on the results from regional surveys conducted in the 1980s, settlements were sparsely scattered across this region during the entire Neolithic and the Bronze Ages (6500–221 BC), but became much more densely distributed during the Qin and Han dynasties (221 BC–AD 220) (National Bureau 1999: 50–67). This phenomenon suggests that the shifts in river courses and the formation of sand dunes probably occurred during the more recent historic period, rather than in prehistory. Based on the analysis of Kangjia faunal remains, as discussed in chapter 3, land to the north of the lower Wei River may have been covered by thick vegetation and lakes during Neolithic times, and much of this region was probably not inhabited by people.

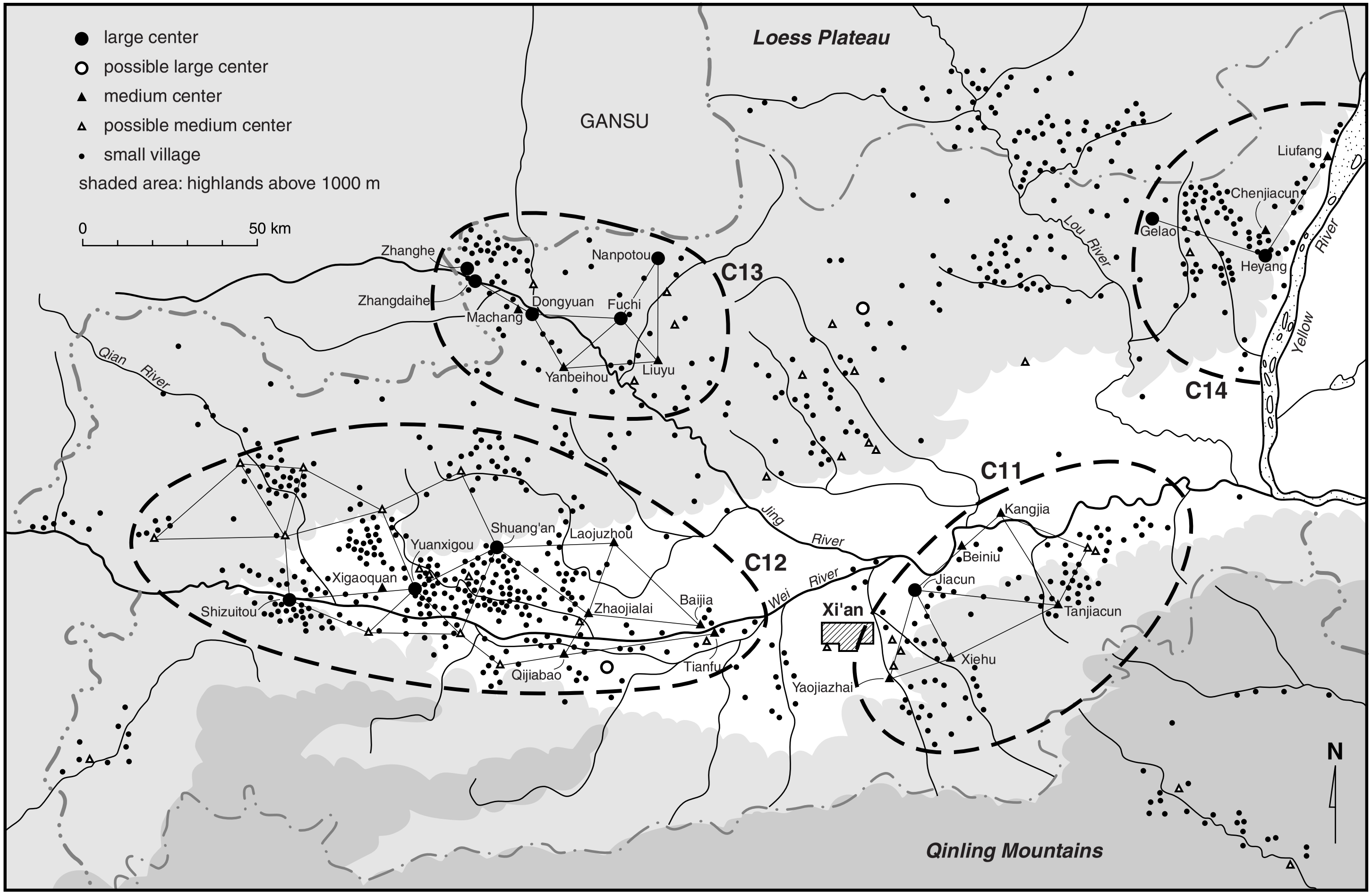


Figure 7.10 Distribution of four Longshan site clusters in the Wei River valley (adapted from National Bureau 1999: 54–55).

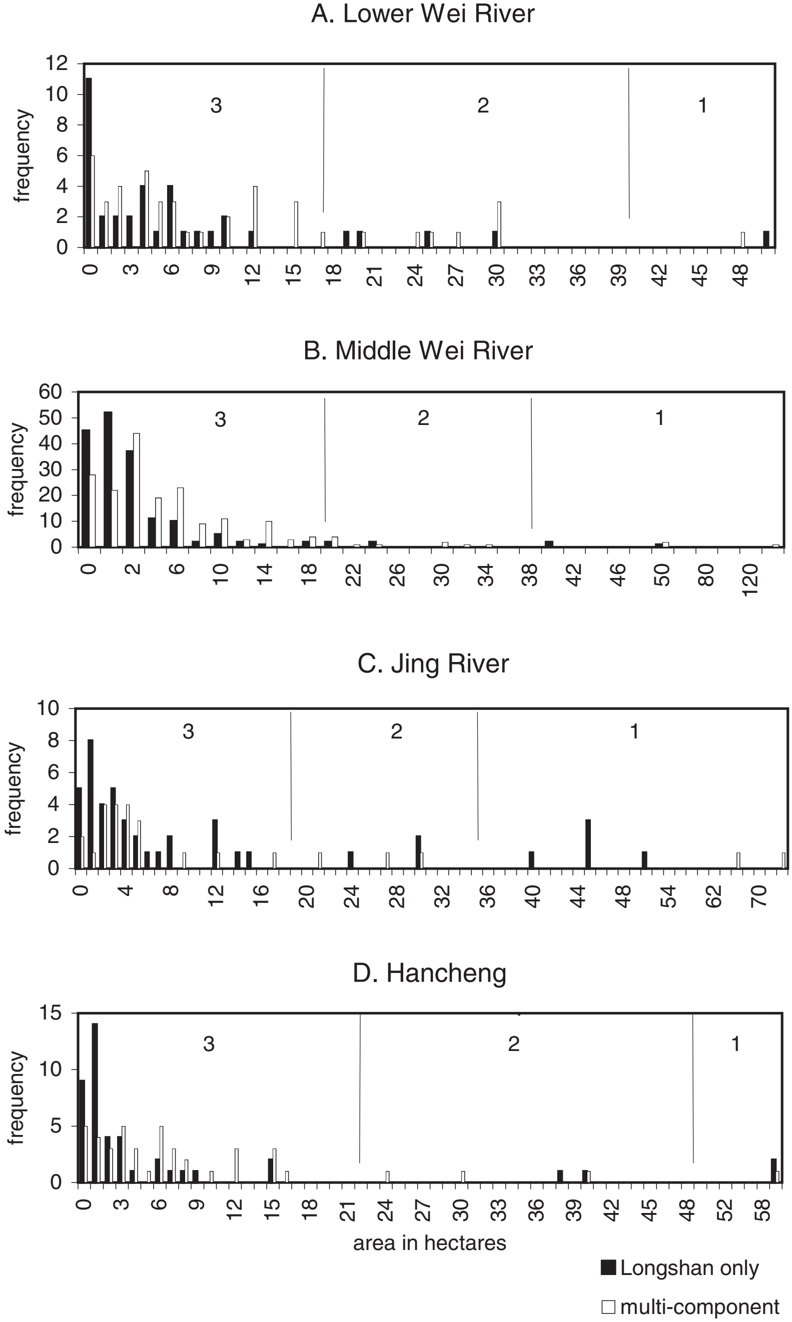


Figure 7.11 Histograms showing three levels of site hierarchy from the four site clusters in the Wei River valley, the Longshan period.

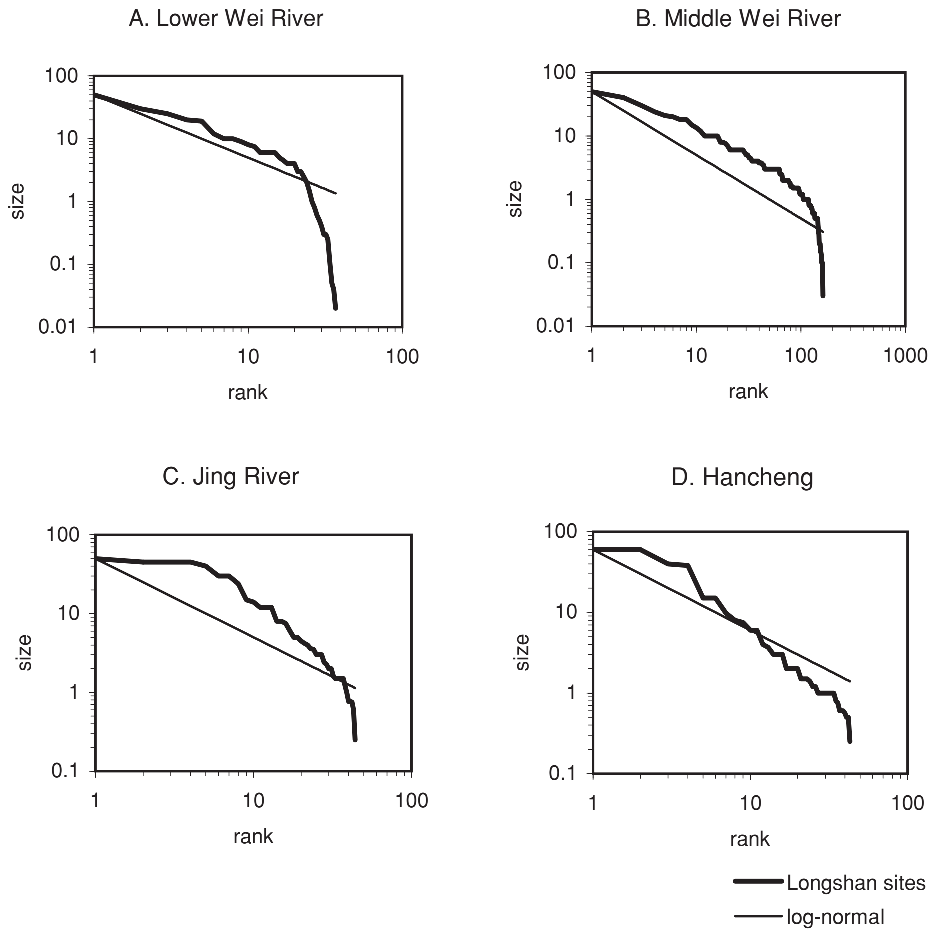


Figure 7.12 Rank-size distribution for the four site clusters in the Wei River valley, all showing convex curves, the Longshan period.

For this region there are one major center (Jiacun, 50 ha), five minor centers (19 to 30 ha), five possible minor centers, and nearly ninety small sites (12 ha or less) (Figures 7.10, 7.11A). The convex rank-size distribution (Figure 7.12A) indicates that Jiacun may have been a sub-regional center, dominating a three-tiered settlement hierarchy in its immediate area, but not in control of the entire cluster. The relationships between Jiacun and other smaller centers, therefore, were probably competitive.

Among the six major and minor centers the site of Kangjia has been intensively excavated. The Longshan community at Kangjia, as discussed in chapter 3, may have formed stratified social organization, as a small group of elites exerting ritual and/or military power over others.

Cluster 12 – the middle Wei River cluster The topographic features of the middle Wei River valley include alluvial plains near the Wei River and loess tableland to the north, with an altitude of 330 to 800 m. Throughout the tableland region, there are several major rivers which run from northwest to southeast and discharge into the Wei River. Several survey and excavation projects have been carried out in this region (Baoji Archaeology Team 1989; Institute of Archaeology 1988b; National Bureau 1999; Wei River Survey 1992; Xi'an Banpo Museum 1983). Most Longshan sites have been found to the north of the Wei River, forming a very large settlement cluster along river courses (Figure 7.10). There are 3 major centers (40 to 50 ha), 6 minor centers (18 to 30 ha), 14 possible major and minor centers, and over 250 small villages (14 ha or less). One of the major centers, Yuanxigou, is closely surrounded by several minor centers and small villages, forming a three-tiered settlement hierarchy, while most other sub-regional centers are clustered with small villages only, forming a two-tiered site hierarchy (Figures 7.10, 7.11B). The convex rank-size curve (Figure 7.12B) suggests a less integrated settlement pattern.

Excavations at several sites unearthed mainly residential features and artifacts made from stone and bone. Burials with a few grave goods (mainly ceramic utensils) were found at Zhaojialai (Institute of Archaeology 1988b). No special features or artifacts indicating social differentiation, such as large public buildings, rich burials, or elite goods, have been found.

Cluster 13 – the Jing River cluster A cluster of sites is located along the middle and upper Jing River valley. This region lies between the terrace land of the Wei River valley and the southern part of the north Shaanxi plateau, at 900 to 2000 m in altitude. About 70 Longshan period sites were found here, including 5 major centers (40 to 50 ha), 3 minor centers (24 to 30 ha), 4 possible minor centers, and more than 60 small villages (15 ha or less). Two of the major centers are extremely close together (less than 5 km apart), suggesting that they may not have been contemporary (Figures 7.10, 7.11C). The convex rank-size curve (Figure 7.12C) suggests a less integrated regional system, although none of these central sites has been excavated to date.

Cluster 14 – the Hancheng cluster Some 86 Longshan sites have been found in the northeastern part of the central Shaanxi plains. The topography of this region is also transitional, between the alluvial plains and the loess plateau, mostly 500 to 1300 m in altitude. The majority of the Longshan sites are situated on terraced land, including 2 major centers (both 60 ha), 2 minor centers, 1 possible minor center, and about 80 small villages (15 ha or smaller) (Figures 7.10, 7.11D). The convex rank-size curve (Figure 7.12D) again indicates a less integrated relationship between centers. There has been no excavation carried out at any of these central sites.

Between the Jing River cluster and the Hancheng cluster there is a group of a few dozen Longshan sites distributed across the Tongchuan area (Figure 7.10). Since all the medium- and large-size settlements there are multi-component, this cluster cannot be analyzed by the methods used here.

Changing settlement patterns

The settlement distribution in central Shaanxi shows that distances between central places are relatively short, and the estimated average catchment area of each central place is small (Appendix 8.7), in comparison with corresponding criteria from Henan, as discussed in chapter 6.

The majority of Longshan sites are also smaller in size and shallower in depth of deposit than those of the Yangshao period in the same region (Fengxi Team 1962; National Bureau 1999; Wei River Team 1959; Wugong Team 1983). For instance, a remarkable rate of decline in site size and site number from Yangshao to Longshan is recorded in the surveys along the lower Qi River valley. For the late Yangshao culture, there are 13 sites in the River valley, ranging from 0.8 ha to 30 ha in size, among which the Fengyou site (30 ha) may have been the center. For the early Longshan period, 12 sites were found, ranging from 0.5 ha to 35 ha, among which Huxizhuang (35 ha) may have been the center. From the late Longshan period, however, only 5 sites, ranging from 0.32 ha to 18 ha, remain with Zhaojialai (18 ha) as the center (Figure 7.13) (Wei River Survey 1991, 1992; Wugong Team 1983).

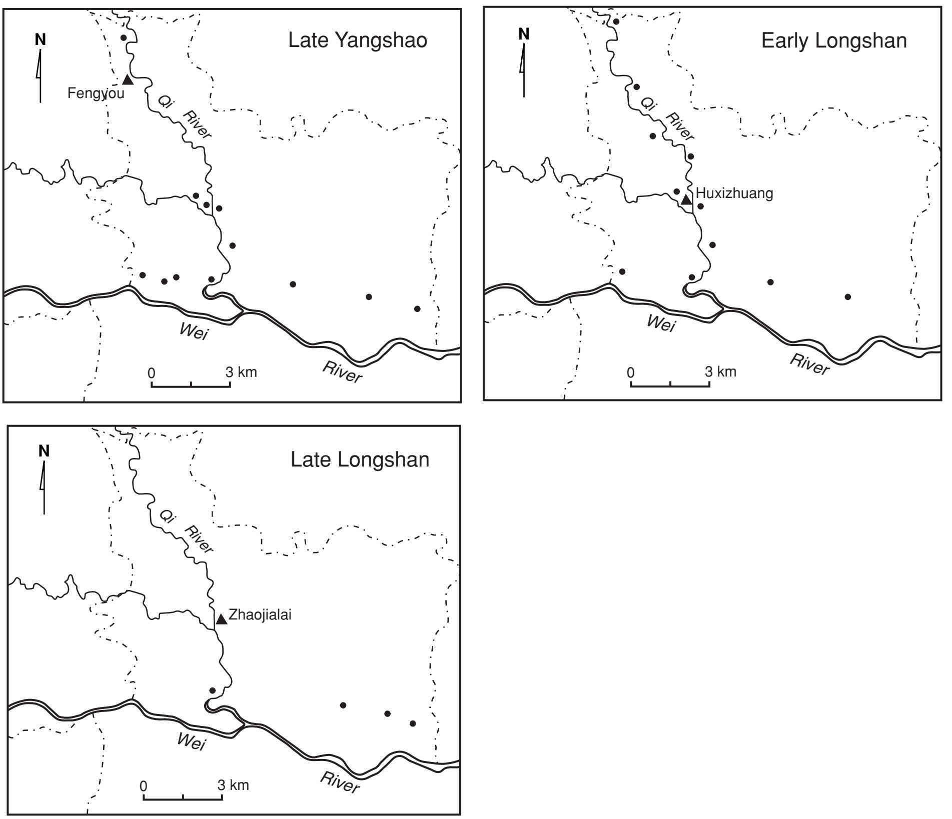


Figure 7.13 Site distribution in the lower Qi River valley, Shaanxi, showing a decline of site density from late Yangshao to early and late Longshan (adapted from Wugong Team 1983: fig. 1; Wei River Survey 1991: fig. 1, 1992: fig. 1).

The reduction of site numbers and site size in central Shaanxi seems to parallel an increase of those criteria in the surrounding areas to the north, west, and east. On the north Shaanxi plateau region there are 700 sites dating to the Yangshao period, while there are about 1,360 sites dating to the Longshan period (National Bureau 1999), which is a 93 percent increase (Figure 2.5C). At least three sites associated with ceramic assemblages of the Keshengzhuang variant have been found as far north as Inner Mongolia (Wei and Cui 1994: 135–136), suggesting a northward population movement. In the Hulu River valley in Gansu, which is situated on the upper reaches of the Wei River, the number of sites increases by 370 percent around 2100 BC (see below). Furthermore, in the east, the Linfen basin in southern Shanxi experienced, initially, a sharp growth in site numbers by 142 percent from the late Yangshao to early Longshan periods, and then, the development of a highly integrated settlement pattern with large-size centers (see chapter 6). The dramatic reduction in the number of sites observed in the Wei River valley may be attributable to gradual population movement out of central Shaanxi into surrounding areas during the late part of the third millennium BC.

A recent study of site distribution along the Hulu River, a tributary of the upper Wei River, may help us to understand the implications of changing settlement distribution in this region. The changes in settlement patterns there seem to correspond with climatic changes and agricultural activities (Li Fei *et al.* 1993). Situated on the loess plateau, the Hulu River has an altitude ranging from 1,130 m in the south to 1,950 m in the north. Its prehistoric cultures experienced a long sequence of development from the Pre-Yangshao (ca. 5800–5000 BC) to Qijia (ca. 2400–1900 BC) periods. Settlement distribution in this area, from the early Yangshao (ca. 4800–4000 BC) to the Lower Changshan period (ca. 2800–2200 BC), shows three general trends: (1) a northward shift, from 35° 37′ to 36° 57′ in latitude (Figure 7.14), (2) a rise in surface elevation, from 34 m to 70 m above the present river level, and (3) an increase in site numbers (from 23 to 80), site size (from 6.7 to 10 ha), and in the average thickness of site deposits (from 1.1 to 1.6 m). Subsequently, towards the end of the third millennium BC, this overall pattern seems to have been interrupted. On the one hand, settlement distribution retreats southward (from 36° 57′ to 35° 55′ in latitude), but surface elevation continues to move upward (from 70 m to 80 m above the present river level). On the other hand, site numbers increase dramatically (from 80 to 376), yet site size (from 10 to 3.9 ha) and thickness of site deposits (from 1.6 m to 1.0 m) decrease (Li Fei *et al.* 1993) (Figure 7.15).

The earlier northward shift of the settlements was probably affected by the general development of agricultural activities benefiting from the climatic optimum, a tendency observable in other parts of the loess plateau. The rise of settlement elevation as a general trend probably suggests an increase of precipitation, which may have raised river levels, consequently forcing people to resettle on higher and dryer ground. This hypothesis is supported by the existence of a layer of silt, 20 to 30 cm thick, probably flood sediment, directly above the cultural deposits which date to the pre-Yangshao period at the Dadiwan site (Li Fei *et al.* 1993: 837).

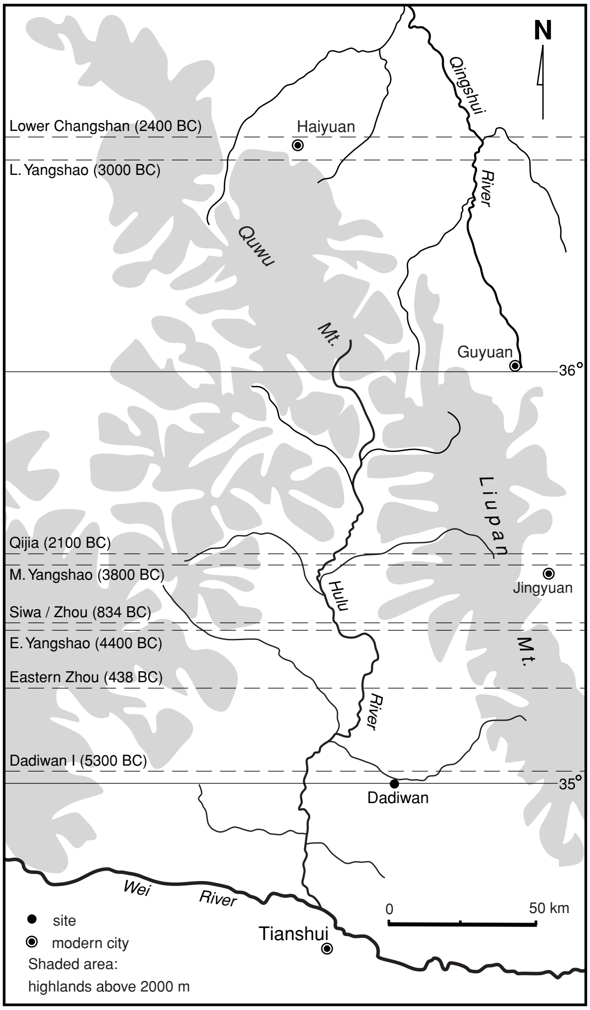


Figure 7.14 The change of cultural distribution in latitude in the Hulu River valley, Gansu. The broken lines indicate the northern boundaries of archaeological cultures dating from the early Neolithic to late Bronze Age (adapted from Li Fei 1993 *et al.*: fig. 1).

The southward retreat of settlement distribution and the continuing movement of site locations to higher elevations during the Qijia period seems to coincide with the inference of a colder and drier climate ca. 4,500–3,000 BP based on a paleosol profile at Dadiwan (Li Fei *et al.* 1993: 838). These conditions conform to the general climatic trend after the East Asian monsoon retreated southward around 6,000 cal. BP, as discussed in chapter 2.

The parallel between the increase in the number of sites, on the one hand, and the decrease in site size and in thickness of cultural deposits, on the other hand, during the Qijia period, may have been the result of two factors. There may have been demographic growth caused by population migration from regions at lower altitude,

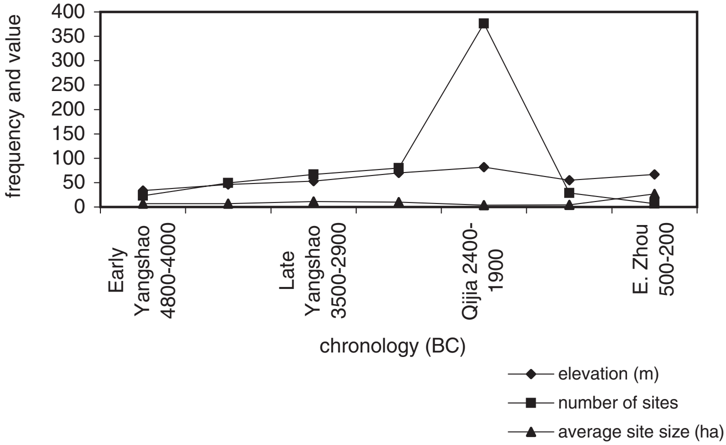


Figure 7.15 Change in settlement location, frequency, and size from the early Neolithic to the Zhou dynasty in the Hulu River valley, Gansu.

such as by the Longshan people from the alluvial plains of central Shaanxi. This proposition can be supported by marked stylistic similarities in ceramic assemblages from the Longshan culture in central Shaanxi and the Qijia culture in eastern Gansu (Xie 1979). As the late Longshan culture in Shaanxi coincides with the early Qijia culture in Gansu, the appearance of ceramic forms shared by them both may suggest population movement from the former to the latter. The thin cultural deposits of Qijia sites may indicate that the length of site occupation was generally short, and that people tended to move more frequently than previously (Li Fei *et al.* 1993: 833). The increased mobility of agricultural settlements may be the result of climatic deterioration, as well as over-exploitation of land, which led to the rapid decline of soil fertility, followed by settlement abandonment. It is important to note that the number of grazing animals appears more frequently in Qijia sites. At Qinweijia and Dahezhuang in Gansu, for example, large numbers of cattle and sheep/goat bones were discovered in mortuary and ritual contexts (Gansu Team 1974, 1975). These phenomena suggest that a transition, from agriculture to a mixed subsistence economy of agriculture and pastoralism, may have begun to take place in the upper Yellow River region.

The rapid increase in site numbers during the Longshan period in north Shaanxi, similar to the Hulu River region, may be the result of the frequent relocation of settlements to exploit arable land in uncultivated territories. The North Shaanxi plateau has been subjected to severe soil erosion whenever it has been farmed throughout history, and the fertility of its soil declines rapidly after a few years of cultivation (Chen Kewei 1993; Zou 1990: 41–74). Increased agricultural activities there during the Longshan period may have caused soil erosion on a greater scale, not only damaging the environment of the region, but also contributing to the high silt content of river systems which eventually discharge into the Wei and Yellow Rivers. This, in turn, may have led to more frequent floods and changed the courses of the Wei and Yellow Rivers.

Population decline in the Wei River valley may have continued after the Longshan period. Sites dating to the Erlitou period (ca. 1900–1500 BC) are also rare in the Wei River valley. About eight sites with Erlitou deposits (pits and burials) have been found in the lower Wei River and southern Shaanxi, while only some isolated ceramic vessels of Erlitou style have been identified in the upper Wei River region (National Bureau 1999: 56–57; Tan 1982; Zhang Tian'en 2000). These phenomena suggest that the lower Wei valley was the westernmost periphery of the Erlitou culture's distribution. In the upper Wei valley, however, there is a lack of data to demonstrate a transitional phase, of a few hundred years (ca. 2000–1600 BC), which might link the Longshan cultural remains with the Shang/Proto-Zhou material assemblages. This region was the homeland of the Western Zhou dynasty (1045–710 BC), but it is still unclear how and where this political power developed in Proto-Zhou times.

The Longshan culture may not, however, have simply ended with an event of drastic climatic fluctuation, since it was not only the Longshan sites situated on alluvial lowlands which disappeared from the archaeological record, but also those sites located on terrace land at a relatively high altitude. It is difficult to explain such a cultural absence across a very broad region during a long period. The Longshan ceramic assemblages, which are used to establish chronology in Chinese archaeology, may have been continuously made by the people who lived in this region during the early part of the second millennium BC, while the Erlitou assemblages were predominant in the east. Most radiocarbon date samples obtained from central Shaanxi Longshan sites fall into a period between 2500 and 2000 BC, but a few have dates between 2000 and 1500 BC (Institute of Archaeology 1991: 251–271). These may indicate that the Longshan material culture continued to exist on a smaller scale in this region. This situation was probably uncommon, however, and central Shaanxi was likely to have been much less populated during the Erlitou period than the surrounding regions.

Settlement patterns and social organization: a comparison

Each site cluster in Shandong and central Shaanxi is formed in a somewhat unique way according to specific geographic configurations, and yet certain common patterns are found among them. Some demonstrate similarities with those settlement systems in the Central Plains discussed in chapter 6, while others manifest unique features.

The Shandong region

Three settlement clusters in Shandong are situated between the Taiyi mountain system on one side and other natural barriers on the other side. The north Shandong cluster lies in an area between Bohai Bay to the north and the Taiyi Mountains on the south, the Rizhao cluster is located in a narrow pocket of land between the mountains on the west and the Yellow Sea to the east, and the Linyi cluster is situated between the mountains in the north and the periodically inundated region to the south. The Xuegucheng walled site, which is probably associated with some other sites, is also located between the mountains in the east and a region with large lakes and swamps in the west. In this way, these four clusters were all circumscribed geographically to some extent. The west Shandong cluster is situated in the least circumscribed area in this region; although the Ji River flowed through on the eastern side of the settlement cluster, there are no natural barriers on its western side (Figure 6.8). Two different settlement systems developed in the Shandong region, and these are discussed below.

Mono-centered centripetal regional system Cluster 8 in Rizhao is represented by the existence of a single large center associated with four levels of settlement hierarchy, a log-normal curve on the rank-size distributions, and rapid demographic growth during the Longshan period. The development of this settlement system may have been affected by its optimum location – near lithic resources, and as a junction for marine transportation. The production and distribution of elite and utilitarian goods may have stimulated the rapid growth of population as well as the hierarchical settlement system there.

Similar to the Taosi cluster in the Central Plains (See chapter 6), the Rizhao cluster can also be characterized as a mono-centered regional system, representing the most complex type of chiefdom system in Shandong.

Multicentered competing regional systems Clusters 7, 9 and 10 in Linyi, as well as north and west Shandong, are characterized by the distribution of a number of centers with two or three levels of settlement hierarchy, and the rank-size distributions all show convex curves. Most sub-regional centers were built with town walls, indicating competitive relationships between polities. A regular spacing between centers is observed in the north Shandong cluster, in which the average distance between the four centers is 42 km. This pattern is consistent with corresponding data from the Central Plains, a phenomenon suggesting inter-group political competition and independence (Earle 1991c: 93), as well as a territorial administration controlled by the local elite (Johnson 1982: 425; Renfrew 1975: 14) (see also chapter 6).

A rapid rate of demographic growth may also be observed in these clusters. In Linyi it may have been the result of population migration from other areas, such as from northern Jiangsu, where ecological conditions deteriorated. The arrival of migrants probably reinforced and accelerated the development of the existing power structure and social hierarchy. In north and west Shandong, settlements increased in number and expanded across a broader area which became inhabitable because of climatic fluctuation and changed geographical configurations. These conditions include a cooler and dryer climate, the retreat of the coastline, the reduction in the size of lakes and ponds in the circum-Bohai region, and the Yellow River's changed course from north to south (Wang Qing 1993; Wang Qing and Li 1992).

These three clusters, in many respects, resemble the competing systems of the northern Henan cluster in the Central Plains. These are decentralized settlement systems, characterized by the emergence of multiple medium-size sub-regional centers, distributed in a linear pattern, and many with fortifications. Therefore, they can also be categorized as multi-centered competing regional patterns, representing less integrated chiefdom systems in Shandong.

The central Shaanxi region

Central Shaanxi is a geographically less circumscribed region. Although the Qinling Mountains may have formed natural barriers to human habitation and movement, and far fewer sites have been found in southern Shaanxi (National Bureau 1999), nevertheless, the vast northern Shaanxi plateau, which could have absorbed a great number of farming communities, was within easy access. The four clusters distributed here are somewhat unique compared to those in other regions.

Diminished regional systems Clusters 11–14 in the Wei River valley show two characteristics of settlement distribution similar to those in central and northern Henan. The largest settlements are medium size (no more than 60 ha); although three levels of settlement hierarchy are identified, most sub-clusters have two-tiered systems. Many phenomena observed in central Shaanxi, however, are different from their Henan and Shandong counterparts. First, none of the centers was walled. Second, the Neolithic sites appear to have decreased in density and size from the Yangshao to Longshan periods, and such declines continued after the Longshan period. And third, this general trend of decline seems not to have been reversed during the Erlitou period, and the region only became prosperous again under the Shang dynasty's territorial expansion.

The process of population decrease and cultural decline paralleled population increase in surrounding regions, suggesting that people gradually moved out of the Wei River valley. The absence of walled settlements in this region may have several implications. As the construction of rammed-earth fortifications required a relatively high level of leadership to mobilize population, the lack of such installations may suggest low levels of socio-political control, in regard to leadership strategy. Furthermore, the less circumscribed natural environment allows a higher level of mobility of the population, which may have led to lower levels of inter-group competition for resources, and thus less development in socio-political complexity. Notably, excavations at Longshan sites in central Shaanxi have not discovered any such elite burials or prestige goods as seen in Shandong, a factor which also suggests the existence of a lower level of social differentiation.

I refer to the Wei River valley cluster as the least-developed settlement system, representing diminished chiefdoms. This pattern seems unique in the Yellow River valley.

Discussion and conclusions

Similar to the Central Plains, complex societies may have already emerged in both Shandong and the Wei River valley prior to the Longshan period during the fourth millennium BC. However, social structures in these two regions may have been very different, as indicated by different features in their archaeological records. In Shandong the exchange of elite goods, the practice of mortuary hierarchy, and the building of walled settlements during the Dawenkou period suggest the emergence of social differentiation (see chapter 5). In the Wei River valley it was the construction of large public buildings during the late Yangshao period that implies the development of social complexity (see chapter 4).

During the Longshan period, settlement patterns in these two regions continued to show clear differences, which may be the result of a combination of many factors, including topographic features, climatic conditions, and socio-cultural traditions. Three models of settlement systems are identified in Shandong and Central Shaanxi. First, the mono-centered centripetal system in Rizhao, which resembles the early Taosi cluster in the Central Plains. Second, the multi-centered competing systems in Linyi, north Shandong, and west Shandong are similar to their counterparts in north Henan. Apparently, a circumscribed geographic environment, the movement of coastlines, river flooding, and changes in the Yellow River's lower courses, all created important environmental conditions. Third, the four clusters in central Shaanxi are characterized by diminished settlement systems, which is unique for the entire region under study. A general decrease in site size and site numbers from Yangshao to Longshan periods contrasts with the trends in the surrounding regions to the west, north, and east of central Shaanxi, which demonstrate outward population movements. The precise reasons for such migrations are complex and difficult to determine, but may have been at least partially attributable to environmental changes caused by climatic fluctuation. The non-circumscribed geographic conditions between the Wei River valley and the northern loess plateau may have facilitated population movement towards the north where agricultural potential was greater, as the north was much less populated than the south prior to the Longshan period.

None of the social systems in Shandong and central Shaanxi developed into state-level social organizations through their own internal dynamics. There are probably many causal factors relating to the trajectories of social evolution in these two regions, including pre-existing socio-political conditions, leadership strategies, and environmental changes. These issues will be dealt with in the next two chapters.

8

Trajectories toward early states

> Yu controlled the floods, defined the territories of the Nine Prefectures, and regulated the land-use system. Every state paid tribute in accord with the distance of their locations [from the capital] and their local products. Shortage and abundance were balanced through redistribution, and the Ten Thousand States were pacified.
>
> "Shihuozhi" in *Hanshu*, by Ban Gu (AD 32–92)

Introduction: from chiefdoms to states

China is one of the most ancient civilizations/states in the world, and today few people question its independent development. However, there is little consensus among scholars concerning the dates, locations, and main actors involved in the formation of the earliest state in China. Regarding these issues, three different opinions have significantly affected archaeological approaches. The first opinion, held by some Chinese archaeologists and historians, is the most radical. It holds that early civilization emerged during the Longshan period or even earlier, as indicated in the use of written inscriptions, bronze metallurgy, the construction of city walls or large public structures, institutionalized ritual, human sacrifice, and marked social stratification in mortuary contexts (e.g., Li Xueqin 1997b: 20–38). Textual information has also been sought to support this opinion; the era of the legendary Five Emperors is frequently regarded by many archaeologists as related to the period of late Neolithic cultures (e.g., Cao 2001; Xu Shunzhan 1999). Recent excavations at several sites in central Henan, such as Wangchenggang and Xinzhai, and Taosi in Shanxi are aimed at searching for the earliest stage of social development of these legendary polities.

The second opinion on state formation, favored mostly by Chinese scholars but also by some Western Sinologists, argues that the establishment of the Xia dynasty (ca. 2100–1600 BC) symbolizes the emergence of the earliest civilization/state in China, and that the material remains of this dynasty are represented by the Erlitou culture (ca. 1900–1500 BC) centered in the Yiluo basin, western Henan; the Erlitou site itself is regarded as the capital of the late Xia dynasty (e.g., Chang 1999: 71–73; Childs-Johnson 1988, 1994; Du 1991; Gao Wei *et al.* 1998; Li Xueqin 1997a; Song 1991; Wang Lixin 1998; Zhao Zhiquan 1987; Zou 1980). From this perspective, Erlitou and its contemporary cultures in the Central Plains are the major focuses for the study of early states.

Many Sinologists in the West, who have not been convinced that the Erlitou culture was a state-level society, prefer a third opinion. That is, they question the historical relationship between the archaeological remains known as the Erlitou culture and the legendary dynasty of the Xia (e.g., Allan 1984; Allan 1991; Bagley 1999: 130–31; Keightley 1983; Linduff 1998: 629; Railey 1999: 178–86; Thorp 1991), and some doubt if the Xia actually existed at all (Allan 1991).

This variety of interpretations on state formation in early China is related to both the nature of archaeological practice and the definition of state. The cultural–historical-oriented approaches in China have led scholars to focus mainly on individual artifacts and sites, on the one hand, and on historical events recorded in ancient texts, on the other. Such interpretations are usually reductionist in nature, that is, they assume a direct linkage between material assemblage, often pottery typology, and recorded social/ethnic groups. These kinds of archaeological data provide insufficient evidence for studying social organization.

Different approaches to basic conceptual and methodological issues, such as the definition of a state and the means of identifying it in the archaeological record, have yielded different outcomes regarding state formation. One commonly used definition comprises a checklist of cultural traits, such as writing, urbanism, metallurgy, and social stratification, as described above. Archaeologists worldwide have realized that no particular set of cultural traits can be applied to define the state on a universal basis. A writing system, for instance, was absent in many early civilizations/states. In addition, there are two deficiencies when these criteria are applied to Neolithic China. First, the above-mentioned traits have not been found together at any single Longshan site; rather, they usually occurred individually at various sites dated to different times. However, many scholars tend to treat these independent occurrences as a coherent development, which qualifies all sites in the entire region as states. Second, the presence of these cultural traits *per se* does not automatically explain the nature of social organization in a given society, and we still need to study the social mechanisms related to these material innovations further.

A good example is bronze metallurgy, which has always been used as a definitive component of civilization/state in China, although an examination of the archaeological contexts of these metal items raises questions about the suitability of this standard. Copper and bronze objects first appeared in the Majiayao culture (ca. 3100–2700 BC) in the upper Yellow River region, and then became scattered over the Yellow River region during the second half of the third millennium BC (Linduff 1998; Linduff *et al.* 2000). These earliest metal artifacts are mainly personal ornaments and utilitarian items including small tools and weapons, and there is little correlation between early bronze/copper items and social hierarchy in archaeological records prior to the Erlitou period, since few metal items occur as status symbols in elite burials (Liu, L. 2003). At Taosi, for instance, a copper bell was found in a small Longshan tomb with no other grave goods, while most elite tombs yielded no metal artifact (see chapter 4). It is clear that bronze did not enter the inventory of prestige goods for a long time after the technology became available to the Neolithic people. That is probably because metallurgical techniques were limited to making small utilitarian objects, which were not used as a means for expressing social hierarchy in the existing political systems. Therefore, it is questionable to use the presence of metallurgy as a benchmark for defining civilization/state in China. Other material traits, such as written inscriptions and walled settlements, also show similar problems, since the social contexts of their development are still unclear.

This study uses a different set of criteria to measure levels of social complexity, mainly based on settlement patterns and mortuary data. As demonstrated in the previous chapters, the Longshan culture indeed shows many signs of socio-political complexity. Some polities, such as Taosi and Rizhao, appear to have reached high levels of socio-political development. However, those Longshan polities were relatively small in territory, and tended to go through cycles of development and decline. In particular, their remains lack evidence for the existence of an internally specialized ruling group, which would satisfy Wright's definition, that "the central process is divisible into separate activities which can be performed in different places at different times" (Wright 1977: 383). This criterion may be archaeologically recognizable if we can see the presence of a palatial complex containing structures with various administrative functions (Flannery 1998; Sanders 1974). Neither Taosi nor Rizhao has revealed such data.

There is more substantial evidence for arguing that the Erlitou culture represents the first state-level society in China, regardless of its relationship to the Xia dynasty. But it is also understandable that searching for the material remains of the first prehistoric dynasties, the Xia and its contemporary rival, the Proto-Shang (the Shang society before the establishment of the Shang dynasty), is socially and intellectually meaningful for Chinese scholars, given the historiographic and nationalist orientations associated with the development of modern archaeology in China (see chapter 1).

The Xia and Proto-Shang, if they existed, developed in a period for which no writing system has yet been seen in the archaeological record; thus other archaeological data provide available evidence for understanding their social organizations. Three areas, which were mentioned in ancient records relating to the homeland of these two dynasties, have been the foci of archaeological studies in this regard. First, a region including southern Shanxi and western and central Henan (where the Longshan culture developed into the Erlitou culture) has been the major focus for the search of the Xia dynasty (e.g., Zhao Zhiquan 1986; Zou 1980). Second, northern Henan and southern Hebei, in which archaeological remains contemporary with Erlitou are identified with the Xiaqiyuan culture, are believed to be the general region in which the Proto-Shang culture originated (e.g., Li Boqian 1989; Zou 1980). Third, an area near Shangqiu in eastern Henan and western Shandong has also been regarded as the region in which the early Shang state may have emerged (Chang 1987, 1995; Murowchick and Cohen 2001). The third region is known as a Yellow River flood zone, where ancient sites are deeply buried and regional surveys are difficult (Jing and Rapp 1995; Jing *et al.* 1997). Therefore, the other two regions, from which better archaeological data are available, is the focus of the following discussion on the development of early states.

The Erlitou culture – searching for the Xia dynasty

The Erlitou culture (ca.1900–1500 BC) was named after the discovery of a Bronze Age site at Erlitou in Yanshi, western Henan in 1959 (Xu Xunsheng 1959). Excavations at Erlitou since 1959 have yielded rich cultural remains including palatial/temple foundations, bronze-casting and bone-carving workshops, kilns, house foundations, burials of different social status, bronze and jade ritual objects, and enormous amounts of stone, bone, shell, and pottery artifacts (Erlitou Working Team 1984, 1986, 1992, 2003; Institute of Archaeology 1999b). The Erlitou period is further divided into four successive phases, based on changes of ceramic style, at estimated intervals of around a hundred years (Institute of Archaeology 1999b; Zheng 1996). Erlitou, measuring 300 ha in its residual area (Erlitou Working Team 2001), is the largest among all its contemporary sites in China. During the past four decades there have been a number of interpretations regarding its historic affiliation with either Xia or Shang, but in recent years most Chinese archaeologists have reached a consensus that this site was most likely the capital of the late Xia dynasty (Gao Wei *et al*. 1998).

More than 200 sites containing Erlitou material assemblages have been found over a very broad region from the middle Yellow River to the middle Yangzi River regions. Most sites are concentrated in Henan and southern Shanxi (Liu, L. *et al*. 2002–2004; National Bureau 1991; Shanxi Team 1989), but some are also scattered in Eastern Shaanxi (National Bureau 1999; Zhang Tian'en 1998, 2000) and Hubei (Huangshi Museum 1984; Hubei Institute 2001) (Figure 8.1). The histogram of Erlitou site size shows a four-tier settlement hierarchy (Figure 8.2), including (1) 1 major center, Erlitou (300 ha); (2) 2 minor centers, Shaochai (60 ha) and Fucun (40 ha); (3) 11 large villages (25 to 15 ha), which may have been secondary or tertiary centers; and (4) a large number of small villages, measuring 13 ha or less (Appendix 8.8).

These sites are distributed along several river systems. Most of the large sites are concentrated on the core area near Erlitou in the Yiluo region, forming a four-tiered settlement hierarchy centered at Erlitou, while the peripheral centers are relatively small, associated with two-tiered settlement systems. The rank-size distribution illustrates a primate curve (Figure 8.3). This pattern of settlement distribution is new to the Yellow River region, indicating the emergence of a highly integrated and centralized socio-political system.

Origins of the Erlitou culture

The question of the Erlitou culture's origins has continually engaged archaeologists. The Erlitou culture has two regional variants, distinguished by ceramic styles. The sites found in Henan are classified as the Erlitou variant, while those in southern Shanxi are categorized as the Dongxiafeng variant. The ceramic and burial data suggest the Erlitou variant developed locally from the Longshan culture mainly in central Henan through an intermediate period, the Xinzhai phase (Yuan 1996; Zhao Zhiquan 1986). The Xinzhai assemblages have been identified at a few sites (Figure 8.1 right insert), probably dating to the period between the late Longshan and Erlitou Phase I (Zhao Qingchun 2002; Zhao Zhiquan 1986). On the contrary,

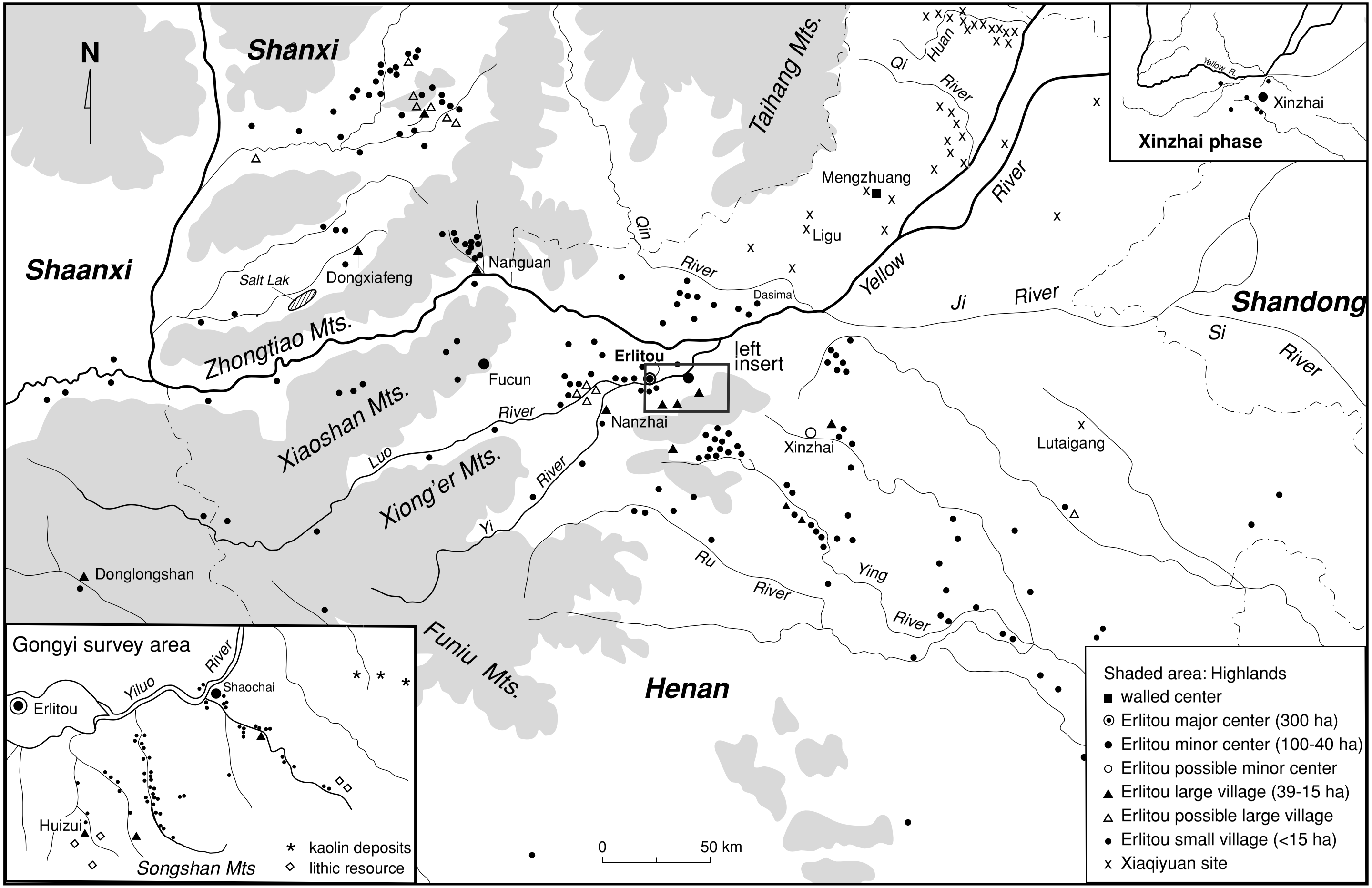


Figure 8.1 Distribution of Xinzhai, Erlitou, and Xiaqiyuan sites, noting that the concentration of sites in the east part of the Yiluo basin and the Huan River results from recent systematic regional surveys.

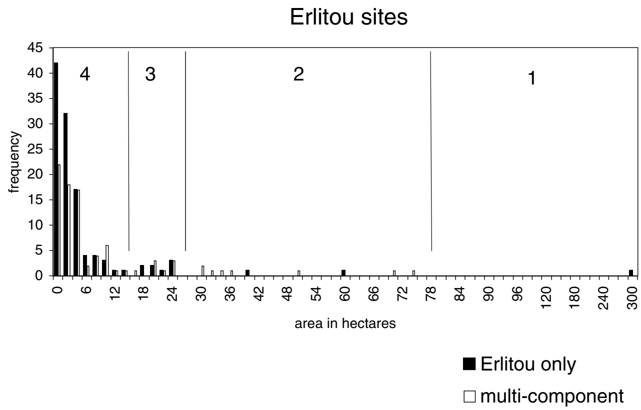


Figure 8.2 Histogram showing a four-tiered settlement hierarchy of the Erlitou culture.

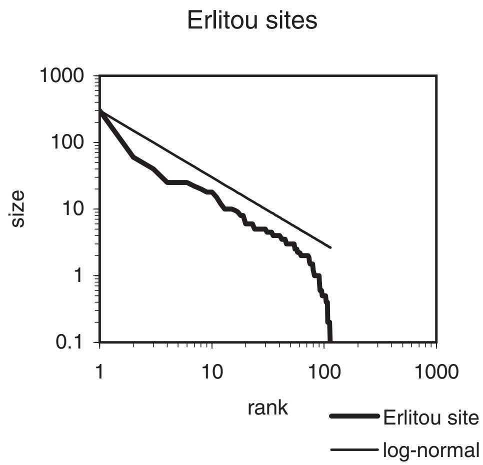


Figure 8.3 Rank-size distribution of the Erlitou culture showing a very strong convex curve.

the material cultural continuities from the Longshan culture to the Erlitou culture in southern Shanxi are notably weak (Gao Tianlin and Li 1987; Shanxi Team 1980a). The earliest ceramic remains of the Erlitou culture in southern Shanxi and the Qin River valley of northern Henan date to Phase II of the Erlitou period (Li Boqian 1989; Yang Guijin 1997), and this new cultural assemblage appears to have been a combination of material traditions from local and neighboring regions with a predominance of elements from the Erlitou culture in western Henan (Ji 1995; Li Weiming 1997). Because the local Longshan cultural traditions in southern Shanxi largely disappeared in the Dongxiafeng variant, while a strong association in material culture exists between the Erlitou culture in Western Henan and the Dongxiafeng variant, it has been suggested that the change of archaeological culture in southern Shanxi may have been, to some extent, the result of an expansion of the Erlitou culture from its core areas to the northwestern regions (Ji 1995; Li Weiming 1997).

Central Henan, which seems to be the origins of the Xinzhai phase, has therefore been the focus of a search for the rise of the Erlitou state.

Central Henan is the region where Cluster 6 is defined, representing multi-centered competing regional settlement patterns, characterized by extensive cultural interaction, especially inter-group conflict, and frequent power shifts among polities. It is noteworthy that the core region of the Xinzhai phase (Figure 8.1) is situated in the area where the Wangchenggang, Wadian, and Guchengzhai sub-clusters of the late Longshan culture are defined (Figure 6.16). These three sub-clusters, each with three levels of site hierarchy and two with walled centers, reveal the most complex settlement system in central Henan. The Xinzhai site, relatively large in size (70 ha) and representing a cultural transition from the late Longshan to the Erlitou culture, is also located in the Guchengzhai sub-cluster. This area seems to be the central sector of the settlement network, and may have been the pivotal point at which change began to take place.

The establishment of the primary center at Erlitou in the Yiluo River valley, rather than in central Henan where most Xinzhai sites were distributed, is an unsolved mystery. As recorded in ancient texts, the Xia kings relocated their capital in several locations, many of which have been identified in the core area of the Erlitou culture in central Henan (Zou 1980: 219–251), where inter-group conflict and constant shifting of political centers are the major characteristics in the late Longshan culture. Although the exact motivations behind these actions are difficult to know, it is possible that some relocations of the Xia capital were the consequence of inter-group warfare, and some may be more idiosyncratic, such as the result of divination and rulers' deliberate choice (Chang 1976: 22–71; Keightley 1983: 552).

The development of the Erlitou urban core area

Erlitou is situated on the center of the alluvial plains in the Yiluo basin, surrounded by the Yellow River in the north and mountains in the other three directions. The Yi and Luo Rivers run through the basin, and join together before discharging into the Yellow River (Figure 8.1). The emergence of this first urban center at Erlitou was probably primarily on account of its fertile agriculture land, as well as the suitability of its relatively circumscribed natural environment for military defense, and finally its easy access to surrounding regions via water channels for the transportation of goods. Erlitou's initial development was unlikely to have relied only on natural indigenous population growth. There was a 500-year gap between the Neolithic (early Longshan) and Erlitou occupations of the site. In its Phase I Erlitou appears to have become a sizable settlement, probably a regional center, although its site size is unknown. It was associated with several types of craft production, including pottery, bone artifacts and bronze. The development of Erlitou, therefore, may have been the result of population migration from elsewhere or an amalgamation of several villages from the region (Liu in press [2005]).

The process of urbanization began at Erlitou in Phase II, and reached its peak in Phase III. Based on a preliminary estimate, the population size at this urban site may have reached 18,000 to 30,000 persons during Phase III (Liu in press [2005]).

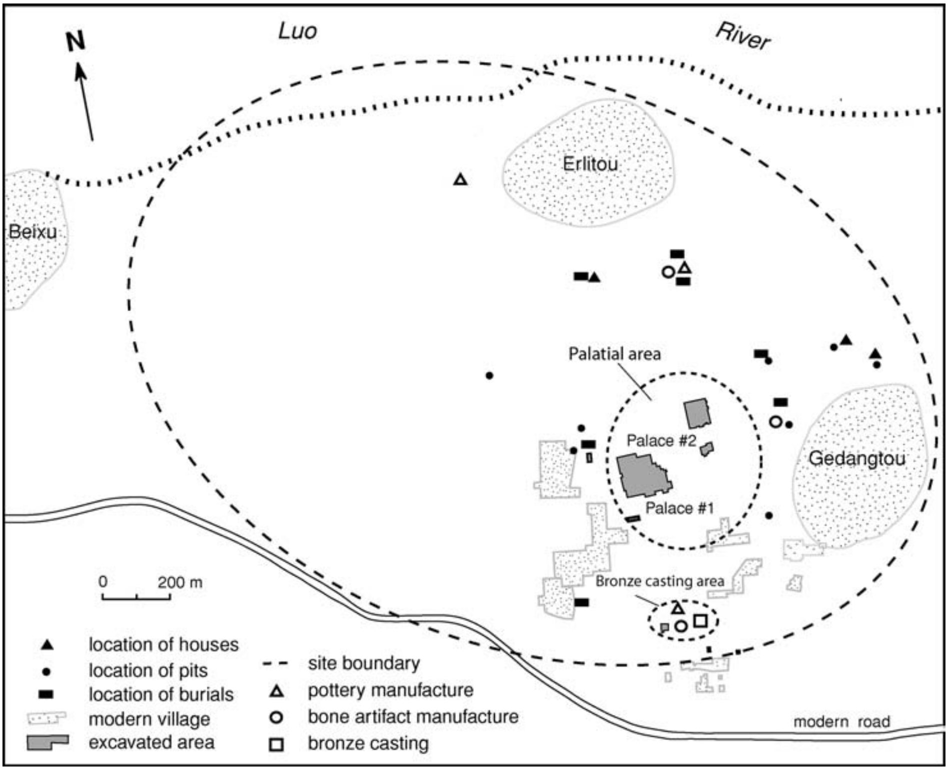


Figure 8.4 Sketch map of the Erlitou urban center (adapted from Zheng 1996: 80; site boundary based on the description of Erlitou Working Team 2001).

A palace/temple complex was constructed, comprising more than 30 structures, varying in size and built on rammed-earth foundations (Figure 8.4), among which 6 have been excavated. The largest palatial compound (Palace no. 3 built in Phase II) measures 0.75 ha in area (150 m long and 50 m wide); 5 elite burials have been found in its courtyard (Erlitou Working Team 2003). Palace no. 1 (9600 m^2 in size) and Palace no. 2 (4200 m^2 in size), built in Phase III, were enclosed compounds. Each has a large courtyard surrounded by roofed corridors (Figure 8.5) (Institute of Archaeology 1999b), perhaps for conducting ritual ceremonies (Thorp 1991). These buildings vary in layout, probably suggesting different administrative functions; the presence of elite burials inside the Palace no. 3 compound also correlates to the highly developed social hierarchy in the society. The Erlitou palatial complex is much more multifarious in structure than those at any large Longshan site; it is also the first example in China which is comparable with the ground plans of palaces in many archaic states from other parts of the world (see Flannery 1998).

The construction of this palatial complex clearly indicates the emergence of political centralization at Erlitou. Furthermore, it was accompanied by the significant development of bronze production. Beginning from Phase II, a group of bronze

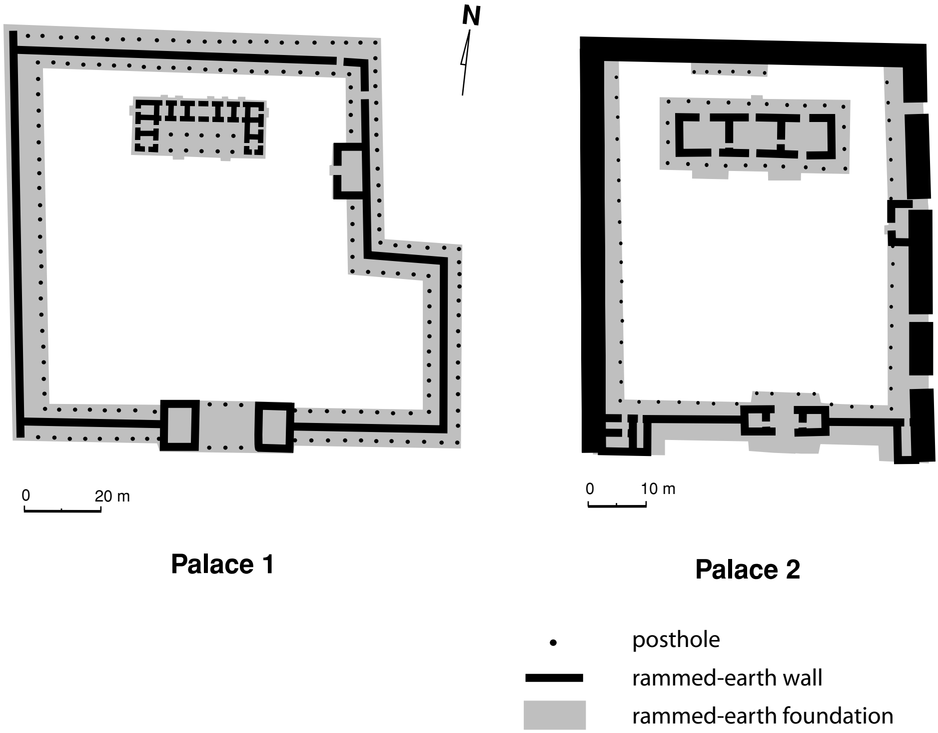


Figure 8.5 Plan of palatial structures no. 1 and no. 2 at Erlitou (adapted from Yang Hongxun 2001: figs. 20, 29).

workshops near the palatial area began to produce not only utilitarian items but also ritual vessels, using piece-mold techniques (Institute of Archaeology 1999b). These ritual bronzes, in the form of drinking and cooking vessels, were likely used in ancestral cult ceremonies, and symbolized power and status (Chang 1983a). Among its contemporary sites Erlitou is the only locale that yielded evidence for the manufacture of bronze ritual vessels (Liu, L. and Chen 2003). Bronze casting at Erlitou was carried out at the same location (immediately south of the palatial complex) throughout the entire period when ritual vessels were produced (Figure 8.4). It is also notable that these ritual bronze vessels have only been found within the Erlitou site, primarily in elite burials. All these phenomena suggest that the technology of casting ritual vessels may have been specially controlled by a particular group of craftsmen attached to the Erlitou high elite in this primary center, and that the production and distribution of ritual bronzes were matters of particular interest to the state rulers (Liu, Li 2003, in press [2005]). This mode of prestige-goods production may be described as attached craft specialization, as defined by Brumfiel and Earle (1987: 5).

At the same time, we also see an increased scale of production of non-prestige goods, such as pottery and bone artifacts; the location of these productive activities tended to be situated at a greater distance from the palatial area and dispersed around the settlement. The pattern of these utilitarian products' distribution and consumption is poorly understood; it is possible that large quantities of these goods produced at Erlitou were intended to meet the demand from both the urban and adjacent rural areas (Liu, L. in press [2005]).

During Phase IV at least one more palace structure (Palace no. 6) was built, some palatial (Palace no.2) and other large edifices built in previous phases continued in use, and elite individuals were still being buried in elaborate tombs. However, there are clear signs of decline at the site. The population diminished and material remains become scattered. The socio-political status of Erlitou was almost certainly downgraded significantly by that time. Erlitou was still occupied after Phase IV, during the early Shang period, but became much smaller in size, and sparsely populated (Erlitou Working Team 2003; Institute of Archaeology 1999b).

Taking all these factors into account, Erlitou was a political, economic and ritual center with a large population of up to 30,000 people in its heyday. The ability to control the production and distribution of sacred prestige goods, especially bronze vessels, was the essence of the Erlitou ruling elite's political power (Liu, L. in press [2005]).

The geographic location of Erlitou in the Yiluo alluvial plains means that area adjacent to this urban center had few non-agricultural resources. Several types of resources seem to have been most critically needed at Erlitou: a large quantity of timber for constructing palaces and temples; lithic materials for making stone tools; kaolin clay for making elite ceramics (white pottery); copper, tin, and lead for casting bronzes; timber and charcoal as fuel for casting bronzes; and salt for cooking and processing food. Most of these resources were only available in areas peripheral to the Yiluo basin or even more distant regions, and the Erlitou elite must have made considerable effort to procure these resources in order to maintain the urban development. A full-coverage regional survey project conducted by the Yiluo Sino-Australian-American team in recent years has revealed some marked changes in regional settlement patterns, a finding which supports this proposition emphasizing resource procurement. Settlement distribution in the Gongyi region, east of Erlitou, shows a general increase from the Neolithic to Bronze Age, in site size, site number, and level of site hierarchy. But the most rapid settlement nucleation occurred during the Erlitou period, indicated by the development of sub-regional centers, forming a four-tiered settlement hierarchy. These centers in the Erlitou rural areas constituted focal points in regional economic systems by producing and extracting both subsistence goods (e.g., food, stone tools, and construction materials) and elite goods (white pottery) for the urban center (Liu, L. *et al.* 2002–2004). Given the fact that no high-level prestige goods (jades and bronze ritual vessels) have been found in the Erlitou hinterland, the economic relationship between urban and rural settlements appears to have been asymmetrical, suggesting a tributary system (cf. Wright 1977: 381–382). This four-tiered settlement hierarchy with Erlitou as the primary center, which developed in the Yiluo region, resembles the settlement pattern in archaic states identified by archaeologists in many other parts of the world (cf. Flannery 1998; Wright and Johnson 1975).

Erlitou expansion to the periphery

The formation of the Erlitou state involved rapid territorial expansion by colonizing the surrounding regions, and the underlying dynamics were the procurement of vital resources. Since this topic has been thoroughly treated in another publication by Chen and myself (Liu, L. and Chen 2003), I will only summarize some major points here.

The expansion of the Erlitou culture is indicated by the appearance of many sites associated with material assemblages typical of Erlitou Phases II–IV. These settlements extended into peripheral regions in southern Shanxi, southern Shaanxi, and Hubei, and were near rich natural resources, especially salt and metal. Some of these sites were secondary centers, or outposts of the Erlitou state, and the distance between Erlitou and these outposts in the periphery varies from 100 to 500 km as the crow flies (Appendix 8.8). This cultural expansion is probably the result of population migrations directed by a centralized state, in order to procure vital resources (Liu, L. and Chen 2003). At the Erlitou site a marked increase in the number of projectile points occurs in Erlitou Phase III, a period coinciding with the Erlitou territorial expansion, suggesting the Erlitou expansion was probably coercive in nature (Liu, L. in press [2005]).

In south Shanxi the Hedong salt lake was the major salt resource available in the entire middle Yellow River valley, and copper deposits in the Zhongtiao Mountains are the nearest to the Yiluo region (about 150 km northwest of Erlitou). Evidence for bronze metallurgy dated to the Erlitou period has been found in two regional centers there, Dongxiafeng and Nanguan (Figure 8.6), which may have been the Erlitou polity's outposts for procuring copper and salt (Liu, L. and Chen 2001b).

Erlitou material culture also expanded toward southeastern Shaanxi, exemplified at Donglongshan in Shangzhou. Donglongshan (20 ha) is located on the north bank of the Dan river (Figure 8.6), with a close proximity to copper resources in Mt. Hongyan in Luonan (Huo 1993), and the site dates to the Longshan, Erlitou, and early Shang periods. Similar to the cultural sequence in southern Shanxi, the Erlitou material appeared at Donglongshan in Erlitou Phase III, which had little similarity with the previous local cultural assemblage, but shows clear resemblances to the Erlitou culture in the Yiluo region. In addition, a few pieces of metal slag have been unearthed at the site, suggesting that bronze metallurgy was carried out there (Wang Changfu and Yang 1997; Wang Lizhi 1999; Yang Yachang 2000). Donglongshan was apparently set up by the Erlitou state as an outpost at a strategic location, to control metal resources in the local region (Liu, L. and Chen 2003).

Similarly, Panlongcheng (20 ha) in Hubei, which was in close proximity to abundant copper deposits in the middle Yangzi River valley (Figure 8.6), has yielded evidence of bronze making dating to the Erlitou period, and the material assemblages show a mixture of Erlitou and local styles. This site is also located at a transportation node, connecting resource-rich regions in south China with the Central Plains (Hubei Institute 2001; Wang Jin and Chen 1987). Copper was probably smelted near the mining areas, and the elite at Panlongcheng may have played the major role in forwarding copper ingots to the primary center at Erlitou. The rapid expansion

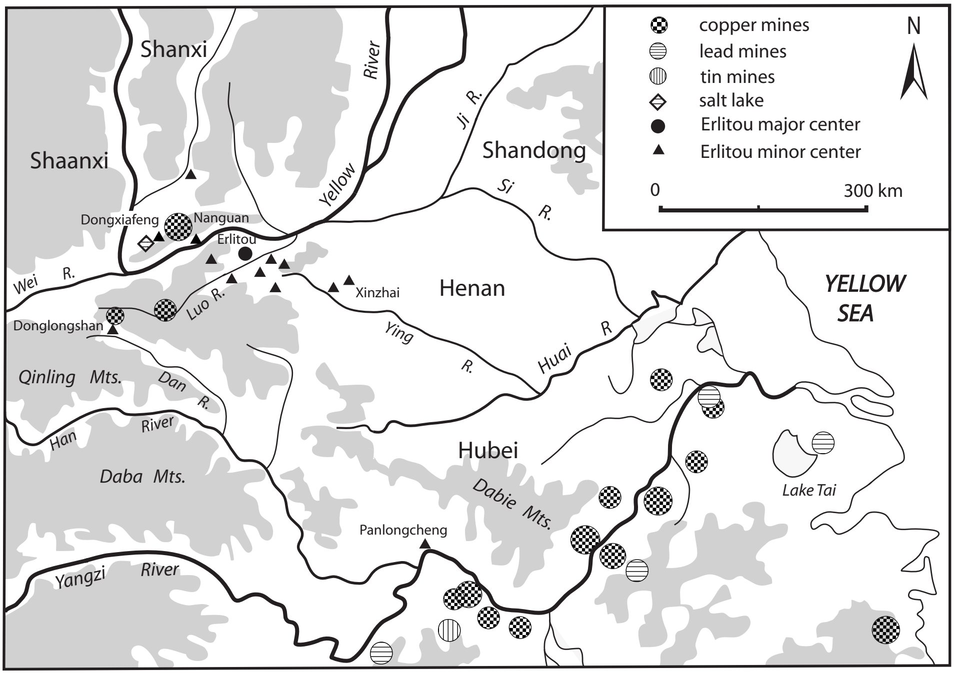


Figure 8.6 Location of Erlitou regional centers in relation to distribution of natural resources, especially metal and salt.

of the Erlitou material culture to these remote regions in many directions seems to suggest a series of attempts to achieve political domination and colonization of the resource-rich peripheries, although the levels of such domination varied considerably in different regions (Liu, L. and Chen 2003).

Erlitou also became a far-reaching polity, with direct or indirect contacts with remote places for acquisition of exotic goods. Cowries (*Monetaia moneta* or *Monetaria annulus*) with possible origins in the Indian Ocean region (Peng and Zhu 1999), and some artifacts and decorative motifs bearing characteristics of Central Asian cultures found their way to Erlitou elite burials (Fitzgerald-Huber 1995).

The relationship between the core and periphery of the Erlitou polity points to the development of centralized political and economic control, a nucleation of population accompanying urbanism, and political and military expansion. The quest for bronze alloys apparently functioned as a driving force underlying the territorial expansion of the Erlitou state. Bronze ritual vessels, in particular, were employed as status symbols that constituted social hierarchy, wealth, and power, and were used as the media of ancestral cult ceremonies, which asserted the elite's political legitimacy (Chang 1983a). The symbolic power of bronzes may have been much greater than that of traditional prestige materials such as jade and pottery. Not only were the properties of bronze extremely appealing, but the production processes of bronze ritual objects required much more complex technological and managerial skills (Franklin 1983), greater manpower, and a broader regional scope than was needed for making other types of elite goods (Liu, L. 2003). Therefore, greater political, economic, and religious powers were associated with this new type of wealth.

Socio-political transition from Longshan to Erlitou

Several changes in settlement pattern and material culture took place when the Longshan culture developed into the Erlitou culture. (1) The number of sites decreased dramatically from about 700 to 200 in the same region (including southern Shanxi and central and western Henan); although the Erlitou period (400 years) is about half of the Longshan period (1,000 years) in duration, the decline in the number of sites is still obvious. (2) Settlement nucleation occurred rapidly, as the largest site increased from 50 ha to 300 ha in size. (3) Settlement hierarchy in western and central Henan changed from two- or three-tier systems to a four-tier system. (4) The political structure changed from the coexistence of multiple competing polities to one in which a single large center dominated smaller centers and villages over a very broad region. (5) In addition to jade objects, which were the traditional means for representing high social ranking in the Neolithic, a new category of status symbols appeared, bronze cast, mainly as weapons and ritual vessels; bronze production may also have become a state-controlled industry, which ensured the state monopoly of bronze products for military and ritual use. And, (6) ceramic styles changed from diversity (six variants of the Longshan culture) to relative uniformity (two variants of the Erlitou culture), which was probably related to the growth of political–economic centralization. The elimination of small polities, easy movement of craftspeople in zones of state control, and the expansion of Erlitou cultural influence may have led to reduced stylistic variability. This situation is comparable to the Han dynasty, when there was a clear parallel between the growing similarity in material culture over a large region (Wang, Z. 1982) and the political expansion of the empire.

The sharp reduction of site numbers from Longshan to Erlitou and the nucleation of Erlitou sites in the Yiluo basin indicate marked demographic changes during the transitional period. Since very few Xinzhai sites have been found, we still know little about this transitional phase. It is possible that the transition from Longshan to early Erlitou witnessed a period of instability and then population decrease. As mentioned above, the Yellow River once more changed its lower course from south to north, some time around 2000 BC, accompanied by river flooding in many regions of the Yellow River valley. The floods may have been caused by climatic fluctuation and/or by human induced environmental deterioration, such as soil erosion in the loess plateau. This date approximately coincides with the presumed time of a legendary figure known as “Yu the Great,” the first king of the Xia dynasty, who is said to have regulated the floodwaters and thus gained political power which then became hereditary. If these events did happen, natural catastrophe may be one of the explanations for the population decrease in the transitional period. Furthermore, such a flood may have provided an opportunity for charismatic individuals to become politically influential, by leading prestate polities to establish political domination over other groups. The expansion of the Erlitou culture and the enlargement of the Erlitou site in Phases II and III may indicate the highest level of political domination by the Erlitou elite.

The Erlitou world-system

Although it is still unclear if the distribution of the Erlitou material culture coincides with the territory of the Erlitou state, there is no doubt that the Erlitou polity established a political–economic domination over a region much larger than that of any Neolithic polity. Such a centralized polity can be characterized as territorial state, as defined by Trigger (1999: 47–50), a point discussed in detail elsewhere (Liu, L. and Chen 2003).

The operation of the Erlitou political–economic system is best described as a world system, consisting of a dominant center and several subordinate peripheral regions. The world-systems concept, first proposed by Wallerstein (1974), has been applied in archaeology, and this application has been controversial (e.g., Frank 1999; Kohl 1987; Stein 1999). Nevertheless, this concept, as an analytical model, can help us to understand the nature of early states in China. World-systems may have as many as four kinds of boundary, and incorporation into a world-system is a matter of degree. These boundaries include: (1) information or cultural flows; (2) luxury or prestige goods flows; (3) political/military interaction; and (4) bulk goods flows (Hall 1999). The Erlitou world-system seems to show these four kinds of boundaries.

The Erlitou state formed an inter-regional network focused on the production and distribution of prestige goods, especially bronze vessels. This network incorporated two interdependent sectors, core and periphery. The dominant core controlled the production of prestige items (bronze products, etc.), and the subordinate periphery provided raw material resources (e.g., metal ingots) and bulk goods (e.g., salt). The Erlitou elite in the core achieved domination through military force by establishing outposts in the periphery to ensure the flows of material and information. This "world-system" was sustained ideologically by a shared belief system centered on ancestral cults which practiced ritual feasting, in which particular types of vessels were used. This cult practice appears to have been adopted by the peripheral communities, a process which in turn helped, at least partially, to form a common cultural tradition revealed as the Erlitou culture in the archaeological record.

The formation of the earliest state (ca. 1800 BC in Erlitou Phase II) in the geographic area of Erlitou culture does not parallel the establishment of the Xia dynasty around 2100 BC, as traditionally believed. However, the tributary system of the Xia dynasty mentioned in *Hanshu*, as cited at the beginning of this chapter, to some extent resembles the political–economic mode of the Erlitou polity.

The Proto-Shang culture

The Erlitou polity did not exist in isolation, and one of its contemporary rivals is believed to be the Proto-Shang. It is unclear if the Proto-Shang was one ethnic group or a number of such groups, but many archaeologists have designated the Xiaqiyuan culture, or a part of it, in northern Henan and southern Hebei as related to the Proto-Shang culture (Li Boqian 1989; Liu Xu 1990; Yang Guijin and Zhang 1994;

Zou 1980). The ceramic types of the Xiaqiyuan culture share many similarities with the Erligang culture (regarded as the early Shang dynasty), but are distinctive from those of the Erlitou culture. A boundary line between the two cultures lies in the Qin River and a part of Yellow River. To the west of the Qin River and to the south of the Yellow River is the Erlitou culture. To the east of the Qin River and to the north of the Yellow River is the Xiaqiyuan culture (Figure 8.1). This archaeologically confirmed cultural demarcation seems to coincide with the development of the territory of the late Xia dynasty, as recorded in ancient texts (Liu Xu 1990).

The Xiaqiyuan culture is much less well understood than the Erlitou assemblage. It was probably derived from a mixed tradition, related to Longshan cultures in northern Henan and central Shanxi (Li Boqian 1989: 292), and may be further divided into two variants: Zhanghe in the north and Huiwei in the south (Zhang Lidong 1996; Zou 1980: 118–120). Nearly 40 sites have been identified as belonging to the Xiaqiyuan culture (Jing *et al.* 2002; Liu Xu 1990; Zhang Lidong 1996; Zhao Zhiquan 1986), but detailed data on site sizes for quantitative analysis are not available.

Based on site distribution, four sub-clusters of sites seem to have appeared along several river systems, and most sites are small. In the Huan River, for example, all 14 Xiaqiyuan sites are smaller than 5 ha, with no central place observable (Jing *et al.* 2002). However, the walled settlement at Mengzhuang (25 ha) in Huixian was in continuous use from the Longshan period to the Xiaqiyuan period (Yuan 1998), and probably functioned as a sub-regional center for the sites clustered around it. A possible sub-regional center is a multi-component medium site at Ligu (24 ha) in Xiuwu (Figure 8.1), dating to a period from the Longshan to Proto-Shang (Peking University 1982). The settlement distribution of the Xiaqiyuan culture seems to have been similar to that of the Longhshan period in the same region (Figure 6.15). It is conceivable that the Proto-Shang culture in northern Henan, like its Longshan predecessors, was also characterized by a system of competing chiefdoms.

Ancient texts recorded that the Xia and Shang were frequently engaged in warfare with other ethnic groups, and the Shang finally conquered the Xia. Some archaeologists have attempted to correlate the Zhanghe variant with the Proto-Shang (Zou 1980), and to link the Huiwei variant with the Wei state which was defeated by the Shang, as recorded in ancient texts (Zhang Lidong 1996). Others have suggested that the polity in the Mengzhuang area represents the Wei state. The abandonment of the town wall at Mengzhuang coincides with the decline of the Erlitou site; therefore Mengzhuang, as the capital of the Wei state, was conquered at approximately the time when the Shang defeated the Xia (Yuan 1998). Two skeletons with traces of scalping were discovered in an ash pit at Dasima in Wushe, dated to the late Erlitou culture (Chen Xingcan 2000; Yang Guijin *et al.* 1994). This site is located 5 km south of the Qin River, which was the natural boundary between the Erlitou and Xiaqiyuan cultures (Figure 8.1). It is still premature to match archaeological sites with political groups mentioned in textual records, but archaeological data evidently indicate a climate of military competition in the process of state formation, as ancient texts suggested.

It is notable that the settlement patterns observed do not suggest the existence of an overarching political entity in the Xiaqiyuan culture area. The Xiaqiyuan culture thus most likely involved a social system with a lower level of social-political complexity than Erlitou's. It is not clear, however, exactly how many polities were distributed in the area covered by the Xiaqiyuan assemblages, neither is it apparent when the Proto-Shang culture formed a state-level social organization, before Xia was conquered. If the Xiaqiyuan culture was related to Proto-Shang, as believed by many archaeologists, then the Proto-Shang was unlikely to have been a single political or ethnic group, but rather a number of chiefdoms probably competing with one another for regional domination. If the transition from chiefdoms to the Shang state had taken place in the Xiaqiyuan culture area before the conquest, it may have happened fairly close to the time of conquest, leaving behind little archaeological evidence of the process.

Conclusions

What is traditionally called the "Xia dynasty" may not have been a state-level social organization in its early period, from the late Longshan and the Erlitou Phase I. The earliest state-level society can be unmistakably recognized from the archaeological record in Phase II of the Erlitou culture (ca. 1800 BC). This development is manifested by construction at that time of a palatial complex at Erlitou, occurrence of elite burials in the palatial area, and expansion of Erlitou settlements to a large territory. Unlike the case of Erlitou, the Xiaqiyuan culture appears to be a network of moderate-sized competing polities, rather than a single political megalith dominating a number of small polities. It remains to be investigated exactly when and how the formation of a Proto-Shang state took place.

As proposed by Chang, regional interactions between competing polities characterized the relationships between early states, namely the Xia, Shang, and Zhou, which coexisted during the Three Dynasties period (Chang 1983b: 512–514). This proposition has inspired us to study social change on a large scale. As more fine-grained archaeological data have become available, we are now able to test this proposition. The results of my analysis presented above suggest that this proposition needs to be revised.

During the Erlitou period inter-group competition among polities with relatively equal power seems to have dominated the peripheral regions where the Xiaqiyuan and Yueshi cultures developed. The Erlitou culture region, by contrast, shows a completely different political scenario, characterized by a centralized socio-political system. The Erlitou state appears to have emerged from a sea of chiefdoms, and continued to coexist with many chiefdoms, which showed different degrees of social complexity, spread over the landscape. These regional polities in the periphery were relatively weak and could not compete with the newly emerging powerful state, as testified by the rapid territorial expansion of the Erlitou culture. Furthermore, during this early period of state formation, as far as we can see, a Proto-Zhou polity is still invisible in the archaeological record.

9

Reconstructing social processes

> State emergence is a relatively rapid, though of course not instantaneous, transformation following on a period of cyclical conflict and limited growth. The parallels between independent cases encourage further efforts to construct general explanations for these phenomena, however they are defined.
>
> Henry Wright (1986: 358)

Introduction

Recent studies of social–cultural evolution have treated the topic from two approaches: process and agency; the relationship between them should be complementary, since most processes are long-term patterns of behavior by multiple agents (Flannery 1999: 18). In the previous chapters I have discussed both process and agency in the development of complex society in the Yellow River region. There are some general tendencies toward social complexity, while social change was affected by multiple factors in no predetermined sequence. The variables affecting social process include environmental and ecological conditions, demographic changes, factional competition, ritual activities, craft specialization, and regional interaction. In this final chapter, I will attempt to offer a comprehensive reconstruction of developmental trajectories toward early states in China. This reconstruction will, in turn, provide the basis for a discussion about the theoretical implications of archaeological research on complex society. These implications are viewed from two perspectives: first, a general evolutionary progress in socio-political hierarchy and integration; and, second, the interplay between particular cultural dynamics and environmental conditions, which affected the variability of social evolution.

Development of social hierarchy and integration

Clear evidence of social hierarchy first occurred in western Henan during the mid-Yangshao period (ca. 4000–3500 BC). This is indicated by the development of a three-tiered regional settlement hierarchy, the construction of a very large public building with ritual function in a central place, and some households engaged in factional competition through feasting and producing special ritual goods (cinnabar). These first characteristics of the emergent social complexity continued to appear in later periods.

Administrative hierarchy, population growth, and territorial expansion

There is a general positive correlation between the number of levels of administrative hierarchy and the levels of social complexity, and the number of levels increased

Table 9.1 *Correlation among social organization, settlement hierarchy, administrative hierarchy, and population size in the Yangshao, Longshan, and Erlitou periods*

Social organization	Examples	Tiers of settlement hierarchy	Levels of administrative hierarchy	Estimated polity/ population size	Size of major center
Multi-centered competing chiefdoms	W. Henan & Zhengzhou, Yangshao	2–3	1–2	Average 227–314 km^2/ 908–1256 persons	20–90 ha
Multi-centered competing chiefdoms	C. and N. Henan, Longshan	2–3	1–2	Average 1256–1519 km^2/ 5024–6080 persons	5–56 ha
Mono-centered chiefdom	Early Taosi, Longshan	3	2	3300 km^2/ 13,200 persons	280 ha
State	Erlitou in Yiluo basin	4	3	Erlitou core area 5689 km^2/54,000–82,000 persons	300 ha

through time. The Yangshao and Longshan site clusters examined in this study, except for Rizhao, demonstrate two to three tiers of settlement hierarchy,[11] while the Erlitou culture illustrates a four-tiered hierarchy. The catchment area of each site group, perhaps indicating the size of a polity, also increases from a few hundred square kilometers for some small Yangshao polities to some 3000 km^2 in the Taosi area of the Longshan culture, and then to more than 5000 km^2 in the Yiluo core area of the Erlitou state, in addition to a greatly extended periphery beyond the Yiluo region.

Such an increase in polity size is certainly associated with growing population size, which is however difficult to estimate. If we adopt the population/area ratio 4 persons/km^2 as a minimal population density associated with civilizations (Sanders and Price 1968: 85), then the populations for Longshan polities would have varied from a few thousand to over ten thousand. Based on a recent study, the Erlitou population size appears to have been much higher, reaching 54,000 to 82,000 persons in the Erlitou core area in the Yiluo basin (Liu, L., in press [2005]). When comparing the results from these estimates, we see a clear tendency of increase in the size of polities from the Neolithic to early state in China (Table 9.1), which seems to resemble the generally defined population scales for chiefdoms and states (Table 6.1).

Notably, Neolithic regional settlement systems also show increasing variability. It is particularly clear during the Longshan period that regional settlement patterns varied dramatically from area to area. Settlement hierarchies range from two to four

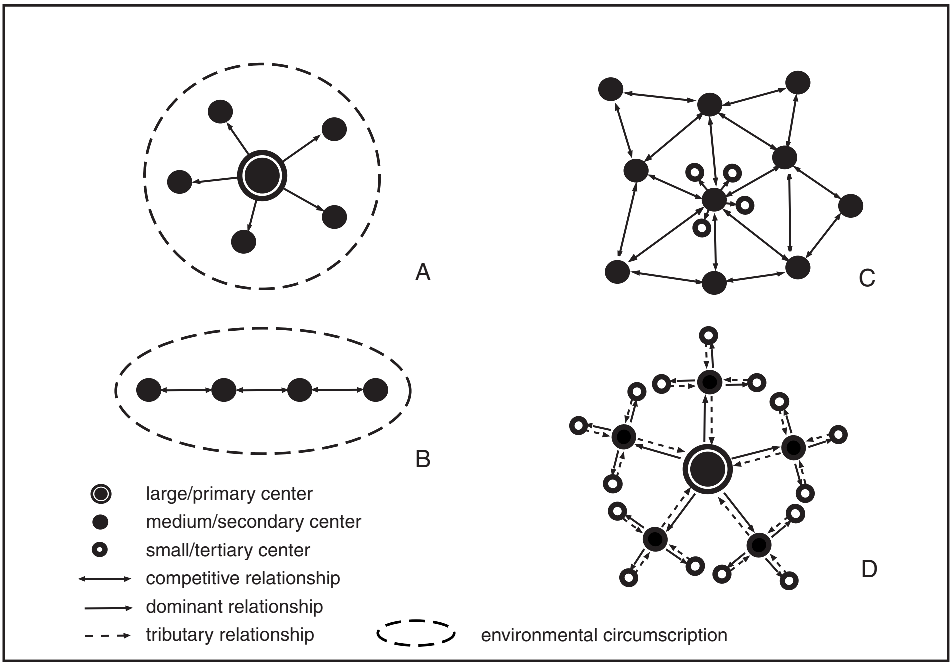


Figure 9.1 Modeling the settlement systems in the Longshan and Erlitou cultures:
(A) Mono-centered settlement system in a circumscribed environment;
(B) Multi-centered linear settlement system in a circumscribed environment;
(C) Multi-centered scattered settlement system in an unrestricted environment;
(D) Tributary relationships in the Erlitou settlement system.

tiers; rank-size curves alter from convex, log-normal, to primate; sizes of regional centers vary from 5 ha to 300 ha; and catchment areas of settlement clusters differ from a few hundred to over three thousand square kilometers (chapters 6 and 7). Four basic models of settlement systems from the Longshan to the Erlitou culture may be observed.

First, there is the mono-centered social system in environmentally circumscribed regions (early Taosi and Rizhao), representing the most complex and integrated chiefdom organizations in the Longshan culture (Figure 9.1A).

Second, there is the multi-centered regional system implying less integrated chiefdom organizations during the Longshan period. This includes two types: the linear multi-centered competing systems found in circumscribed environments, particularly represented by the northern Shandong cluster (Figure 9.1B); and the scattered multi-centered competing systems found in less circumscribed regions, especially in central Henan (Figure 9.1C). The coexistence of multiple medium- and small-sized centers, many with fortifications, suggests the development of a number of independent, competing political entities.

Third, diminished regional systems are inferred from Longshan settlement patterns in central Shaanxi (four clusters in the Wei River valley). This model, composed of multiple medium-size centers and small villages, is similar to the scattered multi-centered system in central Henan. But no rammed-earth fortification has been found, and population decreased remarkably from Yangshao, through Longshan, to the Erlitou period.

Fourth, the establishment of the Erlitou state dramatically changed the socio-political landscape of the Central Plains. It was composed of a dominant core and a subordinate periphery, and operated by a tributary system which ensured the flow of key resources and luxury goods between the urban center and rural areas over a very broad region (Figure 9.1D). The political power of the primary center therefore reached an unprecedented level in this first state.

Settlement patterns tend to alter dramatically in a given region when social transformation takes place. Such examples can be seen in the Taosi and Rizhao clusters, where the most hierarchically organized settlement systems disappeared at the end of the Longshan period; on the other hand, the Erlitou state, as the most centralized social organization, was derived from a less integrated social network (multi-centered scattered system) in central Henan. As summarized in Table 9.2, although a general tendency that societies evolved to more complex forms through time may be observed, there was great regional variability in cultural traits and social formation. Therefore, no linear progression from the more hierarchical form of regional systems to early states can be established.

Based on theoretical models of simple and complex chiefdoms proposed by Steponaitis (1978: 420) and Wright (1984: 42), the Longshan regional settlement patterns seem to fit into both categories. Some theorists have argued that chiefdom societies, especially complex chiefdoms, were a precursor of states (e.g., Carneiro 1981). This proposition would lead one to propose that states developed from the most complex variants of chiefdoms, represented by the Taosi cluster in southern Shanxi or by the Rizhao cluster in Shandong. However, this was not the case. The earliest state, as revealed at Erlitou, was derived from less complex chiefdom systems in central Henan (Figure 9.1C). In this region, nevertheless, the socio-political changes may have initially taken place in the sectors with relatively higher degrees of complexity (indicated by more levels of settlement hierarchy and the existence of town walls). Thus, despite Erlitou's rise from less integrated chiefdom systems, we still cannot simply reject the proposition that more complex variants of chiefdom give rise to archaic states.

Residential and mortuary segregations

Mortuary practice shows a general trend from relatively egalitarian to highly hierarchical, demonstrated by statistical analysis of burial variables (chapter 5). The earliest evidence for mortuary hierarchy comes from the early Dawenkou culture of around 4000 BC. As revealed in several Longshan burial sites, social hierarchy may have existed between kin groups in a community, as well as within sub-units of kin groups; social status may have become ascribed. In most Longshan cemeteries the majority of the high-rank burials were males, and fewer female burials received the same level of high-ranking mortuary treatment. It is likely that the high social status of men over women was related to the intensification of activities related to warfare,

Table 9.2 *Social development from the Neolithic to the early Bronze Age in the middle and lower Yellow River Valley*

Time (BC)	Archaeological Period	Settlement features & social development			
		South Shanxi	Henan	Shandong	Wei River valley
1500– 2000	Erlitou	Periphery of the state	State in W. & central Henan; chiefdoms in N. Henan	Chiefdoms	Chiefdoms
2500/2600	Late Longshan/ Shandong Longshan	One walled site; mortuary hierarchy; long-distance exchange of elite goods	Multiple walled sites; large public buildings; no large burials; no long-distance exchange of elite goods	Multiple walled sites; mortuary hierarchy; long-distance exchange of elite goods	No walled sites; no large burials; no long-distance exchange of elite goods
3000	Early Longshan/Late Dawenkou		One walled site; no large burials; no long-distance exchange of elite goods	Multiple walled sites; large burials; long-distance exchange of elite goods; mortuary hierarchy	
3500	Late Yangshao/ Mid-Dawenkou				Large public buildings
4000	Mid-Yangshao/ Early Dawenkou		Large public building; settlement hierarchy	Mortuary hierarchy	Settlement hierarchy
5000	Early Yangshao/ Beixin		Relatively egalitarian social organization		
7000	Peiligang/Houli/ Laoguantai				

which characterized the Longshan culture. It is notable that the evidence of burial hierarchy during the Neolithic period is mainly present in Shandong and southern Shanxi while absent in Henan and Shaanxi, suggesting a marked mortuary variability among different regional groups (chapter 5).

Large buildings have been found at several Yangshao sites, but they functioned as public ritual centers, rather than as elite residences. Not until the late Longshan culture (2500–2000 BC) were large palace-like elite residential buildings constructed at Guchengzhai and Taosi, marking the beginning of residential segregation between elite and commoners (chapter 4).

It is worth noting that the burial patterns often show more evidence of social differentiation than the residential patterns at the majority of Longshan sites. The lack of data for residential differentiation may be attributed to poor preservation of structures primarily made of earth and wood, and to greater archaeological interest in excavating cemeteries rather than residential areas. However, it is also possible that the Longshan people tended to employ symbolic systems to manifest social hierarchy in mortuary processes rather than in residential contexts, and such practice in mortuary hierarchy is highly visible in archaeological records.

A new type of mortuary practice occurred at Erlitou, where some elite burials were placed within the palace compound. This burial pattern is different from those of all other Longshan settlements, including Taosi, and shows the correlation between mortuary hierarchy and residential hierarchy. While the Taosi elite was still buried next to low-status individuals in the same cemetery, the Erlitou high elite burials were completely separated from commoners. Erlitou therefore is the first site at which residential and mortuary segregations are intermingled.

Strategies for controlling resources

The emergent complex society was closely related to some aggrandizing strategies, especially to monopolize access to desirable resources or roles. Exemplified first at Xipo in Lingbao and then in several cases presented in this book (e.g., Yuchisi and Kangjia), the most commonly used aggrandizing strategies include feasting and control over production of certain craft items, both utilitarian and ritual.

Feasting relationships are fundamental to structuring power relationships within and between communities, and ample examples have been found worldwide (Dietler and Hayden 2001b; Wiessner and Schiefenhovel 1996). Evidence of feasting has been revealed in a number of elite households based on the patterns of faunal and artifact remains (chapters 3 and 4). At Yuchisi of the late Dawenkou culture, for example, multiple households in a community may have engaged in feasting, but these households show little evidence of hierarchical relationships in terms of quality and quantity of material remains. This suggests that factional competition may have been the common social relationship in Neolithic communities, which suggests a context within which some individual households or social sectors sought to obtain power when circumstances allowed.

Ritual feasting continued to play an important role in social relationships when the early state emerged. The most prestigious ritual objects used by the Erlitou elite were bronze cooking and drinking vessels, which were apparently used in ritual feasting. In contrast to the use of traditional pottery food utensils in the Neolithic feasts, the Erlitou elite obtained power and prestige in feasts, not only by providing food, but also by displaying precious serving vessels made of exotic material. The high-cost bronze vessels added a new dimension in competitive emulation between elite groups.

During the Longshan period several large regional centers (e.g., Wangchenggang, Guchengzhai, Taosi, and Liangchengzhen) were clearly associated with the production of important craft items, especially ceramics, stone tools, and jades (chapter 4). Given the scarcity of some raw materials, such as jade and certain types of stone and clay, it would be logical for the elite to attempt to control access to these resources, as well as to monopolize production and distribution of related products. These economic activities, in turn, may have stimulated the development of large regional centers.

Production and exchange of prestige goods, in particular, have been identified as a common elite activity found in many chiefdom-level societies throughout the world (Hirth 1992). As most explicitly revealed in the Shandong Longshan culture, ritual paraphernalia, such as egg-shell pottery goblets, may have functioned as indicators of social status, as symbolic media for forming alliances, and as vehicles for spreading political influence and a common belief system and ritual practice.

During the Longshan period, production of craft items was primarily based on local resources. This may account for the presence of several large regional centers near to important resources, exemplified by Taosi and Liangchengzhen, with close proximity to lithic resources. Elite control over resources and production therefore also operated within a limited regional scope, normally within a radius of 20 km or a half-day journey. This situation conforms to the nature of chiefdoms, in that political growth reaches logistic limits with unspecialized decision-making processes (Spencer 1998). Not until the Erlitou period did the production of craft goods, including both utilitarian and prestige goods, expand to a large regional and supraregional scale. Stone tools and elite ceramics (white pottery) were made in the Erlitou hinterland, and the entire process of bronze metallurgy took place at a trans-regional level, involving at least a hundred kilometers in distance. Unlike the chief who normally controls a territory within the limits of a day's journey from his residence, the Erlitou elite seems not to have been deterred by the greater distance from the capital to their resources. Rather, by establishing secondary and tertiary regional centers at transport nodes near their resources, the Erlitou state expanded its territory well beyond the limits of a one-day-journey. This implies a fundamental change in political organization, involving effective control over the means of long-distance transport for these resources. Such large-scale political–economic operations could have only been achieved by improved methods of administration. Such an administrative technique, described by Spencer as "delegated decision making," is a new component in the leadership strategies. It promotes internal administrative specialization, and thus distinguishes states from chiefdoms (Spencer 1998).

Dynamics of social change

Although there was a general evolutionary tendency through which societies became increasingly complex, we still face an unanswered question. Why did early states emerge from the less complex competing social systems in the Central Plains, rather than from the mono-centered systems with their highly developed social stratification? Multiple factors, both external and internal, may have been responsible. A comparison of environmental preconditions and socioeconomic, political, and religious systems from different regions provides some clues.

Geographic configurations and cultural–social interaction

It has long been recognized that warfare plays a major role in socio-political development (e.g., Carneiro 1970, 1981, 1990; Haas 1990; Lewis 1981). Carneiro (1970; 1981; 1990), for example, argues that states as well as many chiefdoms around the world have risen in areas with environmentally or socially circumscribed agricultural land. Under the situation of population growth, competition for access to limited land would inevitably lead to inter-polity conflict, with the resulting dominance of one group over the others. This theory has not been entirely supported by archaeological examples throughout the world (Wright 1986). Judging from the data presented in this study, while the most complex chiefdom systems in the Taosi and Rizhao clusters did experience population growth and develop in environmentally circumscribed regions, the Erlitou state emerged from less circumscribed conditions with no evidence of notable population increase prior to its formation.

It has been argued that states did not exist in isolation, but rather, developed in a system of polities with much interaction (Price 1977; Renfrew 1975), often referred to as "peer-polity interaction" (Renfrew and Cherry 1986). According to this model, in a given region, several politically autonomous territorial units with their administrative centers, which may be understood as chiefdoms, constitute a "civilization." These polities have equivalent scale and status and share similar cultural features. Social change, as Renfrew (1986: 6–10) points out, emerges from the assemblage of interacting polities at the regional level. The forms of the interaction include warfare and competitive emulation. It is further suggested by Clark and Blake (1994) that certain topographic configurations may serve as favorable conditions for the development of social complexity in a network of communities. When settlement groups have greater potential for interaction with more neighboring centers in an unrestricted topographic condition (open settlement pattern) than in a restricted region (linear settlement pattern), social change tends to take place at focal points of regional social interaction, or in the central sectors of open settlement systems (Clark and Blake 1994: 20).

This model of peer-polity interaction in less circumscribed regions is certainly supported by the Longshan data presented here. The earliest state developed from an open settlement pattern in unrestricted regions of the Central Plains, and the core area of this region, in which the Longshan culture transformed into the Xinzhai phase of the Erlitou culture (the Wangchenggang-Wadian-Guchengzhai sub-clusters in central Henan), was the focal point of regional social interaction.

According to regional studies carried out in many parts of the world, several scholars have suggested that state emergence often occurs in limited areas with dense concentrations of similar-sized centers. The chiefdoms in which states emerged were often characterized by intense competition and frequent replacement of political centers (Wright 1986: 357–358). The state was created, rather than evolved, from the context of groups of competing chiefdoms, when one of them took over its neighbors and turned them into the provinces of a larger polity (Flannery 1999: 5). The evidence from the Central Plains in China is consistent with these general observations.

Social economic systems

Political economic systems in complex societies have been classified into two basic types: wealth finance and staple finance (D'Altroy and Earle 1985: 188; Earle 1987: 294–296; Gilman 1987: 22). In the former, valuable material was manufactured and procured by the elite, exchanged for staples and redistributed as symbols of rank on a regional level. The functions of such an economic system were to cement alliances between the leaders of different groups, and to attract and establish personal clientage relationships with headmen of smaller groups (e.g., Hirth 1992: 28). In the latter, it is surplus staples, such as grain, that were mobilized to support the elite.

The evidence for the production, redistribution, and exchange of prestige goods (e.g., alligator drums, jade objects, and elaborate ceramics) on a regular basis in the Shandong and southern Shanxi regions (see chapter 5) suggests that economic strategy was focused on production and manipulation of prestige-goods. In such societies, described as prestige-goods systems, political power is often associated with control over access to foreign goods that have been assigned high status (Frankenstein and Rowlands 1978). This political strategy may have facilitated a steady expansion of political influence in Shandong and southern Shanxi during the Longshan period. On the contrary, in the Henan region, there is no evidence that prestige goods were produced and circulated regularly by local elite groups. This suggests that the prestige-goods economy was not practiced, although no evidence for the presence of staple finance has been observed either. In this region, as discussed above, military competition was a major force contributing to the socio-political systems.

Political orientations

The regional differentiation, in regard to type of economic system, between the Shandong-southern Shanxi and the Henan Longshan cultures seems to be related to the polarity in political structure of complex societies: individual oriented vs. group oriented. The former type of society identifies and emphasizes elite status, both by special housing and burial structures and by status-defining items of wealth, especially prestigious objects obtained through long-distance exchange. The latter type of society prioritizes the interests of the population group above the status of elite individuals; thus, the importance of group definition was emphasized through investment in corporate labor constructions, and intra-group differentiation was minimal (Renfrew 1974: 74). Valuable objects, rich burials, and large architectural remains have been found at sites distributed over Shandong and southern Shanxi, which may be identified as individualizing chiefdoms. On the contrary, the sites in central and north Henan have so far yielded little evidence for rich tombs, special housing, or exotic prestigious objects, but rammed-earth enclosures were constructed by corporate labor for the protection of the whole community, against both natural and human threats (e.g., floods and warfare). These settlement systems, therefore, can be characterized as group-oriented chiefdoms. It was the group-oriented social system, involved in intensive military conflict by relying on local resources to maintain internal solidarity against outsiders, that gave rise to the early states in north China.

Ritual power

In the religious domain, communities in the aforementioned two political systems also seem to focus on different types of ritual practice. Ancestral cults focusing on a limited number of individuals appear to have been a dominant tradition starting from the Dawenkou culture in the east coast regions. During the Longshan period such individual-oriented ancestor cults seem to have become intertwined with hierarchical social systems, as exemplified at Taosi in Shanxi and Chengzi in Shandong. The ancestors receiving long-term ritual offerings were individuals who held high social status and enjoyed political, religious, and economic prestige in certain prominent families and lineages. The ritual ceremonies were most likely conducted by living members of closely related kin groups. Ancestral cult ritual, therefore, became part of the political institutions, and reinforced the stratified, although still kinship-based, social systems (chapter 5).

The Henan and Shaanxi regions, on the contrary, seem to have followed a different tradition. Ancestors were venerated communally in the Yangshao mortuary rituals, and there is no evidence for rich burials associated with material remains for ongoing ancestral ritual activities during the Longshan period (chapter 5). There are, however, some clues hinting that religious practices relating to natural deities and fertility cults may have been particularly emphasized in this region. Phallus models have been found at many Yangshao and Longshan sites (Song 1983); images of the sun appear on painted Yangshao ceramics at Dahecun (Li Changdao 1983); both fertility symbols and celestial bodies were depicted on Hongshanmiao burial urns (Henan Institute 1995). Excavations at Lutaigang, a late Longshan culture site in Qixian, Henan (Figure 6.16), have revealed further evidence for this tradition. This site yielded a structure (Structure I) situated on a platform 1 m above the surrounding ground level. It had two layers of walls – square outside (the southern wall measured 6.5 m) and circular inside (4.7 m in diameter). Within the circular walls were two paths arranged in a cross. These paths were made of yellow soil, distinct from the surrounding gray-brownish soil in the structure (Figure 9.2) (Zhengzhou University 2000: 37–40). These features are very different from normal residential structures. In addition, no domestic features, such as hearth and ash pit, have been found in or near this structure, further pointing to its non-residential function.

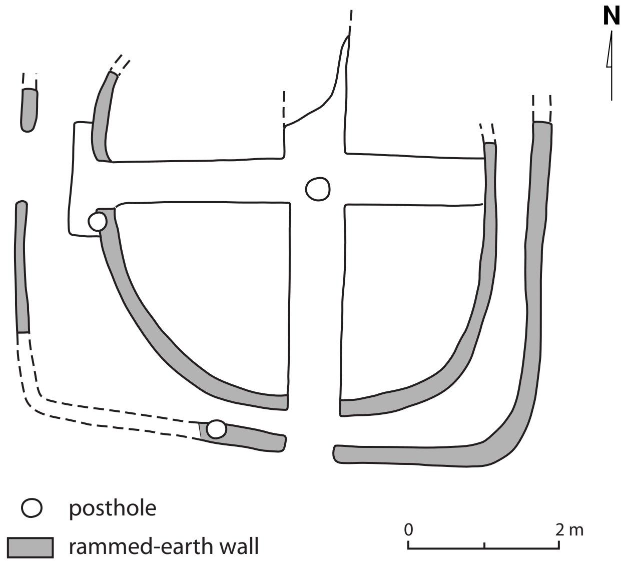


Figure 9.2 Structure I at Lutaigang, Henan, Longshan period (adapted from Zhengzhou University 2000: fig. 20), showing a design with a square outside and a circle inside, perhaps symbolizing earth and heaven.

The shape of Structure I, square outside and circular inside, apparently resembles the shape of jade *cong* tubes which have been found at many Neolithic sites in China (Huang, T. 1992) (Figure 5.4), but Structure I at Lutaigang is the earliest example of such a shape used in architecture. This recurring design of square and round shapes symbolizes heaven and earth in traditional Chinese cosmology. Many archaeologists have interpreted the combination of the two shapes on one object as an indicator of the connection between the two natural realms, heaven and earth, in the religious world (e.g., Chang 1989). Structure I, therefore, may have been designed for the worship of heaven and earth (Liu Chuanying 1997). This structure was located within a residential area of the settlement, but was not associated with any particular houses. It is possible that it was constructed for communal ritual activities toward natural deities.

The contrast between these two types of ritual tradition is clear. On the one hand, the practice of individual-oriented ancestral ritual gave ideological support to individual elite groups' acquisition of power, and the social status of the elite was a major focus of concern. On the other hand, in group-oriented ritual activities the whole community's interests are emphasized, and elite individuals are not identifiable.

Leadership strategies and trajectories to social complexity

The differences in political and religious orientation described above correspond to a dichotomy of leadership strategies, known as the Dual-Processual scheme, which distinguishes the so-called Network and Corporate strategies (Blanton *et al.* 1996;

Blanton 1998; Feinman 1995). Exemplified in many ancient societies worldwide, the network strategy is "a political economic pattern in which preeminence is an outcome of the development and maintenance of individual centered exchange relations established primarily outside one's local group (Blanton *et al.* 1996: 4)." Societies of this kind emphasize the identification of elites by special housing and burial structures, and by status-defining items of wealth, especially prestigious objects obtained through long-distance exchange. Such an individualizing social formation may also be reinforced through ancestral ritual that legitimates the control of society by a limited number of high-ranking individuals or households (Blanton *et al.* 1996: 4–6). The corporate strategy, on the other hand, designates a group-oriented attitude to social formation, in which the interests of a population group were accorded priority over the status of elite individuals. The importance of group definition was emphasized through investment in corporate labor constructions, and intra-group differentiation was minimal. In this case, social integration may be emphasized through communal ritual based on broad themes such as fertility and renewal in society and cosmos (Blanton *et al.* 1996: 5–6).

This dichotomy of these two extreme cases should not be seen as mutually exclusive in reality, but as an analytical model. This model can be useful for understanding the trajectories towards state formation in China based on current data, and to form further research questions. In the Shandong region the exchange and accumulation of prestige goods reinforced the status of individual chiefs. The redistribution of egg-shell pottery among elite groups on a regular basis in the Shandong Longshan culture may have served as a medium for exercising political power and maintaining stability in this region. Controlling production and exchange of elite goods and reinforcing the ascribed social status of powerful individuals through ancestral cults may also have been priorities of the elite.

Although production and distribution of prestige goods as an economic strategy can facilitate a rapid expansion of the sphere of political influence by establishing new channels for exchange, it suffers from high risks and instability. The chiefdom societies that rely primarily on this type of economic strategy are vulnerable to any kind of disruption in the exchange networks that provide the prestige goods needed to sustain the elite. As a result, some societies may alternate between periods of expansion and collapse (Earle 1987; Gilman 1987). This general tendency may explain the decline of the Longshan cultures in Shandong and southern Shanxi, as the societies failed to adjust to the changing social and natural environment.

A series of environmental changes that occurred around the late part of the third millennium BC – climatic fluctuation and overcultivation of land in environmentally vulnerable regions, causing river flooding and the change of the Yellow River's course – also provide some explanation of the cultural disruption at the end of the Shandong Longshan culture. There are, however, signs of gradual cultural decline occurring earlier in the late Longshan period, when the quality of finely made pottery had deteriorated and egg-shell pottery was disappearing (Luan 1993). It is likely that the slow social change was a consequence of both environmental change and human activities. The weakness in the political and economic system which emphasized individual status and network strategies, may have contributed to the decline of social complexity.

In the Central Plains, several phenomena during the third millennium BC may have been responsible for social change. First, a marked population movement from surrounding areas to the Central Plains happened during the late fourth millennium and early third millennium BC. And second, the Yellow River may have changed course twice, and the Central Plains may have been the region most affected by this incident and by floods of many other tributaries of the Yellow River. The construction of walled enclosures at several locales after 2600 BC suggests that their initial function was for protecting communities from floods in this densely populated region. Ritual activities focused on the worship of natural deities may have been an ideological response to long-term environmental instability in this region.

Furthermore, the long duration of conflict between communities may have been the consequence of the intensive use of military force by local elites competing for resources and seeking to obtain regional domination. These factors may account for the practice of a corporate strategy in a group-oriented chiefdom organization. In these societies, the interests of the community were emphasized over the status of elite individuals, and intra-group differentiation appears to have been minimal. As conflict between different ethnic or local groups was intensive, communities may have been forced to rely on local resources to maintain internal solidarity against outsiders. These societies may have been more able to cope with social or environmental impacts. These factors perhaps were the major dynamics contributing to the emergence of the state in Henan rather than in Shandong or southern Shanxi.

If social change tends to take place at focal points in a region where settlement groups have great potential for interaction with many neighboring centers in an unrestricted topographic situation, as pointed out by Clark and Blake (1994: 20), such an environmental situation was one of the major external factors responsible for the emergence of states in the Central Plains. In contrast, the rather circumscribed geographic configuration in all other regions may have limited the opportunities for further political integration.

Environmental conditions were crucial variables, but not the sole causal factors in these social transformations. Both development and decline of social complexity happened in different regions when similar environmental changes occurred (e.g., climatic fluctuation and flooding). It is clear that different socio-political and economic systems and various human actions in response to the external impact contributed to social changes.

Conclusions and further research questions

The development of Neolithic societies from simple to complex, from relatively egalitarian to stratified, and from tribe to state in the Yellow River valley is a long and gradual process. It was stimulated and affected by many environmental and social factors. Optimum geographic and climatic conditions provided a natural basis for the development of a self-sufficient Neolithic economy, while environmental instabilities altered topographic configurations, triggered population migration, disturbed the self-contained social systems of the early Neolithic, and changed settlement systems. In addition, ambitious aggrandizers were always motivated to gain power and status through various means whenever circumstances suited, and factional competition became increasingly dominant in intra- and inter-community relationships, although the elite may have adopted different political strategies. As a result, socio-political inequality developed, regional interactions became intensified, and various types of complex society were formed in different regions.

The development towards social complexity was not a single unified process but, rather, a system of interacting processes, which witnessed both cultural development and decline. Neither development nor decline was an isolated occurrence. Both were interrelated, in that cultural decline in some regions may have facilitated development in other regions. While the early complex societies in many peripheral regions experienced cultural constraint and did not evolve into a higher level of social organization, the societies in the focal areas of the Central Plains developed into the Erlitou state.

The fact is that the earliest state initially emerged from a limited region in the Central Plains, not that multiple states simultaneously developed over many regions in China. However, many more questions concerning social process and agency remain unanswered. We know surprisingly little about agricultural activities, land use, and community diet and health. We lack information on the production and distribution of many craft items, such as ceramics and stone tools, even though they have been used as the most basic archaeological data for typological studies. Although environmental change has been a focus of attention in Chinese archaeology, we do not have fine-resolution chronological control over climatic data, and the study of correlations between social and environmental changes has sometimes met with frustrations. Since our understanding of the transitional period from Longshan to Erlitou (the Xinzhai phase) is insufficient, it is unclear exactly how the Erlitou elite rose to power. Because most excavations have focused on large sites, we are unable to reconstruct the operation of political–economic systems at a regional level during the Neolithic and Erlitou periods.

As a discipline, Chinese archaeology reached impressive achievements in the twentieth century, and is making great discoveries every year in the new century; however, many empirical methods, which may improve the quality and quantity of data collection processes, have only been employed in recent years. The study of regional settlement patterns is still in its infancy, and household archaeology is little known in China. We need more research projects on ceramics, focusing on functional aspects, and on archaeobotany and zooarchaeology emphasizing social issues. Moreover, while many Chinese archaeologists are interested in interdisciplinary approaches and are eager to employ new methods and technologies, only a few have attempted to deal with theoretical issues, and many interpretations of social formation are doctrinal. Nevertheless, it is hopeful that all these deficiencies will be overcome in the near future, since many Chinese archaeologists of younger generations have become aware of these problems and have started making great efforts to change the situation.

China has extremely rich archaeological data, which are still increasing in volume every day; many interpretations in this book, therefore, may be subjected to change when new information becomes available. This study, although imperfect in many aspects, is an attempt to open a new avenue in utilizing these existing records, on the one hand, and in interpreting the data from new perspectives, on the other. As one of the few regions in the world where pristine states emerged independently, China's rich archaeological data provide opportunities for a cross-cultural comparison in the study of world civilizations. By examining diversified trajectories of early complex societies in Neolithic China, therefore, this study enhances our ability to reconstruct one of the non-linear patterns of social evolution in human history.

NOTES

1. The locations for these Longshan cultural phases are defined as follows: (1) Liangcheng in southeastern Shandong, (2) Jiaodong in the Shandong Peninsula, (3) Yaoguanzhuang in the Wei and Mi River valleys of northern Shandong, (4) Chengziyai in northwestern Shandong, (5) Yinjiacheng in central southern Shandong (Xu Ji: 1993), (6) Wangyoufang in eastern Henan, northwestern Anhui, and western Shandong, (7) Wangwan in central and western Henan, (8) Hougang in northern Henan, southern Hebei, and western Shandong, (9) Haojiatai in central and southeastern Henan, (10) Xiawanggang in southwestern Henan, (11) Sanliqiao in southern Shanxi, eastern Shaanxi, and western Henan (Cao Guicen 1994: 123–147), (12) Keshengzhuang in eastern central Shaanxi, (13) Shuang'an in western central Shaanxi (Ji 1986), and (14) Taosi in southern Shanxi (Shanxi Team 1989).
2. In Chinese archaeological literature F, H, and M indicate house, pit, and burial, respectively.
3. The sample size of the faunal remains shipped out of China was decided by the non-academic authorities.
4. This is first exemplified in the concluding section of the Banpo excavation report, as major references relating to the social dimensions of the site are from Soviet publications (Institute of Archaeology 1963: 222–229).
5. Many stone artifacts were identified in the report as chipped tools, including axes, adzes, spades, knives, spearheads, and arrowheads (Institute of Archaeology 1963: 59–97). These are more probably semi-finished tools which had only been chipped and hammer-dressed before being ground.
6. Quotations are from Bodde (1961).
7. The term Central Plains (*zhongyuan*) has two geographic meanings. In a narrow sense it refers to the Henan region, while in a general sense it defines the entire middle and lower Yellow River valley. I use this term here to cover a region including Henan and southern Shanxi, where the first states, Erlitou and Shang, developed.
8. The sizes of the Longshan sites found in Shouguang and Changle were not indicated in the survey reports, while the locations of most Longshan sites discovered in Qingzhou and Changle were not marked on the survey maps; only the Linqu report provides both site sizes and site locations.
9. The Ji River was a major tributary of the Yellow River. It originated in Jiyuan, Henan, running eastward through Henan and Shandong to the Bohai Bay. Its lower course passed through the region north of Jinan city (the city's name means "south of the Ji [River]"), where the Yellow and Xiaoqing rivers run today (Tan 1982). The Ji River dried up in the Wei-Jin period (AD 200–400) (Shi Nianhai 1983: 2).
10. Two inscribed oracle bones along with more than 350 items (tools, ornaments, and pottery vessels), all dating to the late Yueshi culture (contemporary with the early Shang dynasty), were discovered in a sacrificial pit at the Shijia site in Huantai county. The inscriptions include characters *liu* (six), *bu* (divination), etc. (Zibo City 1997), which are similar in structure to the oracle-bone inscriptions of the late Shang dynasty.

11. Presenting four settlement levels, the Rizhao cluster seems to stand out from the other settlement systems. It may have been a borderline case between maximized complex chiefdom and archaic state, if the primary and secondary centers (Liangchengzhen and Dantu) were indeed contemporary. Since the excavations at these two centers are ongoing projects, the nature of this settlement system remains to be investigated.

Appendixes 1 Tool types associated with Neolithic burials

Appendix 1.1 *Tool types associated with burials at Jiahu in Henan, the Peiligang period (total 13 tool types; 96 burials with 34 female and 62 male)*

Tool types	Female burials	Male burials	Summary
Grinding slab	5	0	Female dominant tools (2 types; 15%)
Spindle whorl	1	0	
Scraper	0	1	Male dominant tools (3 types; 23%)
Bone chisel	0	4	
Stone spade	0	3	
Stone roller	1	3	Tool types used by both genders (8 types; 62%)
Axe	4	12	
Adze	1	4	
Chisel	1	1	
Awl	4	2	
Whetstone	5	5	
Needle	20	27	
Bone arrowhead	6	31	

Appendix 1.2 *Tool types associated with burials at Longgangsi in Shaanxi, the Middle Banpo phase of the Yangshao period (total 21 tool types; 91 burials with 50 male and 41 female)*

Tool types	Female burials	Male burials	Summary
Pestle	4	1	Female dominant tools (2 types; 10%)
Pottery file	14	3	
Hammer	0	2	Male dominant tools (5 types; 24%)
Bone spade	0	1	
Jade adze	0	7	
Bone arrowhead	0	6	
Stone arrowhead	1	5	
Stone spade	4	18	Tool types used by both genders (14 types; 66%)
Stone knife	1	2	
Bone knife	6	4	
Bone awl	14	26	
Bone needle	1	1	
Whetstone	14	25	
Stone ball	7	8	
Axe	5	3	
Jade axe	1	1	
Adze	8	14	
Chisel	1	2	
Jade spade	2	3	
Chopper	1	2	
Grinding plate	10	5	

Appendix 1.3 *Tool types associated with burials at Sanlihe in Shandong, the Dawenkou period (total 19 tool types; 45 burials with 18 female and 27 male)*

Tool types	Female burials	Male burials	Summary
Spindle whorl	5	1	Female dominant tools (1 type; 5%)
Chisel	0	8	Male dominant tools (14 types; 74%)
Stone arrowhead	0	5	
Bone awl	0	9	
Bone knife	0	4	
Tooth scraper	0	6	
Bone scraper	0	3	
Shell knife	0	2	
Hammer stone	0	1	
Bone spear	0	1	
Shell sickle	0	1	
Pestle	0	2	
Yue axe	1	17	
Adze	2	12	
Bone arrowhead	1	5	
Long shell tool	13	13	Tool types used by both genders (4 types; 21%)
Shell spoon	10	14	
Needle	1	2	
Whetstone	1	2	

Appendix 1.4 *Tool types associated with burials at Sanlihe in Shandong, the Longshan period (total 10 tool types; 22 burials with 10 female and 12 male; 10 tool types)*

Tool types	Female burials	Male burials	Summary
Spindle whorl	7	0	Female dominant tools (2 types; 20%)
Whetstone	1	0	
Long shell tool	0	1	Male dominant tools (6 types; 60%)
Antler arrowhead	0	1	
Adze	0	1	
Bone scraper	0	1	
Yue axe	0	1	
Chisel	0	2	
Shell spoon	2	5	Tool types used by both genders (2 types; 20%)
Stone arrowhead	1	2	

Appendix 1.5 *Tool types associated with Yangshao burials at Jiangzhai in Shaanxi (total 14 tool types; 23 burials with 12 female and 11 male)*

Tool types	Female burials	Male burials	Summary
Stone scraper	2	0	Female dominant tools (6 types; 43%)
Bone arrowhead	2	0	
Chisel	1	0	
Pai Potter's tool	1	0	
Spade	1	0	
Bone spatulas	1	0	
Axe	0	2	Male dominant tools (3 types; 21%)
Stone arrowhead	0	1	
Spindle whorl	0	1	
Bone knife	1	1	Tool types used by both genders (5 types; 36%)
Stone ball	5	1	
Pottery scraper	2	7	
Awl	1	1	
Pottery file	1	1	

Appendix 1.6 *Tool types associated with Longshan burials at Yinjiacheng, Shandong Longshan culture (total 8 tool types; 8 burials with 1 female and 7 male)*

Tool types	Female burials	Male burials	Summary
Spindle whorl	1	0	Female dominant tools (2 types; 25%)
Shell knife	1	0	
Stone *yue* axe	0	3	Male dominant tools (6 types; 75%)
Stone arrowhead	0	1	
Shell spatulas	0	1	
Bone awl	0	1	
Jade knife	0	1	
Shell awl	0	1	

Appendix 2.1 *Summary of artifacts on well-preserved house floors from four Neolithic sites*

Site and house no.	Room size (m^2)	Total artifacts	Food vessel	Cooking vessel	Tool	Other
Jiangzhai (ca. 4800–4300 BC)				Sandy *guan* pot		
30	16.34	16	10	2	6	
41	11.2	12	11	4	1	
42	12.8	23	17	5	5	1 hairpin
46	10	17	16	6	1	
66	9.4	21	12	2	9	
Average	11.95	17.8	13.2	3.8	4.4	
Dahecun Phase III (ca. 3100–2700 BC)				*ding* cauldron		
1	20.8	14	12	8	2	
19	7.59	22	19	6	2	1 hairpin holder
20	15.28	38	33	7	4	1 hairpin
Average	12.29	24.67	21.33	7	2.67	
Huanglianshu (ca. 2700 BC)				*ding* cauldron		
11	32.8	31	23	1	8	
Yuchisi (ca. 2800–2600 BC)				*ding* cauldron		
8	9.46	17	11	4	6 (1 potter's tool)	
17	13.7	22	21	8	2	
21	13.98	30	27	6	3	
28	18.43	24	19	10	5	
31	14.78	43	40	9	3	
33	17.43	83	68	18	15 (4 potter's tools)	
37	17.71	66	42	5	24 (2 potter's tools)	
42	22.93	29	27	8	2	
Average	16.06	39.25	31.88	8.5	7.38	
Yinjiacheng (ca. 2600–2000 BC)				*ding* cauldron		
204	20	91	75	12	16 (1 potter's tool)	
205	15	42	40	9	2	
Average	17.5	66.5	57.5	10.5	9	

Appendix 3.1 *Ratio of bones (in NISP and percentage) between domestic animals and wild animals from T26, Kangjia, Longshan period*

	Domesticated animals		Wild animals			
	pig	sheep/goat	water buffalo	sika deer	water deer	Total
Early stratum	73 (23%)	44 (14%)	48 (15%)	97 (31%)	53 (17%)	
Subtotal	117 (37%)			198 (63%)		315 (100%)
Late stratum	24 (9%)	20 (8%)	77 (29%)	130 (49%)	13 (5%)	
Subtotal	44 (17%)			220 (83%)		264 (100%)
Entire Longshan	97 (17%)	64 (11%)	125 (22%)	227 (39%)	66 (11%)	
Subtotal	161 (28%)			418 (72%)		579 (100%)

Appendix 4.1 *Faunal remains from pit H71 (N=695)*

Taxon	NISP	MNI
Cipangopaludina	8	8
Unio douglasiae	63	63
Silurus sp.	1	1
Corvidae	3	1
Chinemys reevesii	1	1
Myospalax fontanieri	2	1
Vulpes	3	1
Canis	14	1
Ursidae	1	1
Canidae	2	1
Sus	6	2
Hydropotes inermis	1	1
Cervus nippon	60	4
Ovis	2	1
Capra	1	1
Ovis/Capra	5	1
Bubalus	27	2
Bovine	3	1
rib frag., large mammals	112	
" medium mammals	10	
vert. frag., large mammals	121	
" medium mammals	9	
frag., large and medium mammals	240	

Appendix 5.1 *Residential distribution of the northern cluster in Phase I at Jiahu, early Peiligang period*

Structure no.	Structure type	Nos. of rooms	Nos. of hearths	House area (m^2)	Type of pottery vessel	Tool types	Floral and faunal
F38	Pile-dwelling		0	2.1	None	None	None
F7	Semi-subterranean	1	0	2.3	Cooking, storage, serving; (N=5)	*Maintenance*: Whetstone, hammer stone, stone ball, flake; (N=5)	Fish, shell, pig head
F2	Semi-subterranean	1	1	3.2	Cooking, receptacle, serving; (N=9)	None	Fish, fruit, deer tusk
F11	Semi-subterranean	1	1	6.2	Cooking; (N=3)	None	Fish, charcoal
F3	Semi-subterranean	1	1	8.5	Cooking, storage, water container, receptacle, serving; (N=15)	*Production*: Axe, bone arrowhead; *Maintenance*: tooth knife; (N=4)	Fish, crane, turtle, deer tusk, pheasant
F5	Semi-subterranean	2	1	14.6	Cooking, storage, water container, receptacle, serving; (N=36)	*Production*: axe, bone arrowhead; *Maintenance*: awl, needles, stone pestle, hammer stone, core tool, flake tool, whetstone, tooth knife; *Tool manufacture*: anvil; (N=24)	Fish, raccoon dog, leopard cat
F17	Semi-subterranean	4	1	15.9	Cooking, storage, water container, serving; (N=24)	*Production*: spade, bone arrow, *Maintenance*: stone knife, flake tool, hammer stone, scraper, needle, whetstone, tooth knife; *Tool manufacture*: stone blank, drilling tool; (N=18)	Fish, alligator teeth, alligator scute, raccoon dog, water deer, deer, rice

Appendix 6.1 *Comparison of tool assemblages from Kangjia, Huizui, and Wangchenggang (Longshan period)*

	Stone tools				Bone, antler, shell, & pottery tools		
	Kangjia	Huizui	Wangchenggang		Kangjia	Huizui	Wangchenggang
Axe	14	13	26	Chisel		1	
Adze	6	5	8	Arrowhead	66	27	21
Chisel	4	5	19	Fishhook		1	
Spade		7	109	Needle	24	2	4
Sickle		2	36	Knife	5	4	5
Knife	41	9	52	Awl	93	13	15
Arrowhead	16	16	25	Sickle		3	12
Pestle	6			Spindle whorl	14	9	77
Scraper	7			Fine	3		
Potter's tool	9			Potter's tool	4		
Spindle whorl	1		1	Scraper	7		
Awl			2	Spade	21		
Spearhead			4	Adze	1		
Total number	104	57	282	Total number	238	60	134
Percentage	30%	49%	68%	Percentage	70%	51%	32%

Appendixes 7 Distribution in grave size (in sq. m) and number of grave goods from Neolithic burials

Appendix 7.1 *Distributions of grave size (in sq. m) and number of grave goods from single-interment burials at the Jiahu site in Henan, Phase II, early Peiligang culture*

	All size	Juvenile size	Female size	Male size	Ritual size	All goods	Juvenile goods	Female goods	Male goods	Ritual goods
Maximum	3.32	2.36	3.32	2.4	2.45	33	7	17	19	33
Median	1.1	0.85	1.05	1.2	1.33	3	2.5	2	4	16
Minimum	0.14	0.42	0.25	0.25	1.04	0	0	0	0	4
Mean	1.26	1.26	1.29	1.24	1.57	5.81	3.17	3.42	6.34	14.15
Std. Dev.	0.66	0.84	0.74	0.51	0.55	0.67	2.79	4.02	6.25	9.06
CV	0.52	0.67	0.57	0.41	0.35	0.12	0.88	1.18	0.99	0.64
N	90	6	36	33	10	97	6	38	35	13

Appendix 7.2 *Distributions of grave size (in sq. m) and number of grave goods from single-interment tombs at the Shuiquan site in Henan, late Peiligang culture**

	Grave size	Grave goods
Maximum	4.08	21
Median	1.71	4
Minimum	0.80	0
Mean	1.71	3.97
Std. Dev.	0.39	3.08
CV	0.67	0.78
N	115	115

* The age and sex of the skeletons are not available in the report.

Appendix 7.3 *Distributions of grave size (in sq. m) and number of grave goods from single-interment burials at Longgangsi in Shaanxi, early Yangshao culture*

	All size	Juvenile size	Female size	Male size	All goods	Juvenile goods	Female goods	Male goods
Maximum	4.46	0.96	1.80	4.46	45	7	27	45
Median	1.04	0.48	0.90	1.20	8	4	7	12
Minimum	0.24	0.24	0.38	0.54	0	0	0	0
Mean	1.12	0.58	1	1.36	9.99	3.63	8.34	13.94
Std. Dev.	0.57	0.27	0.37	0.68	8.90	2.77	6.42	10.90
CV	0.51	0.47	0.37	0.50	0.89	0.73	0.77	0.78
N	130	7	53	53	156	8	62	63

Appendix 7.4 *Distributions of grave size (in sq. m) and number of grave goods from the Dawenkou site in Shandong, Early Dawenkou Phases II and III*

	All size	Juvenile size	Female size	Male size	All goods	Juvenile goods	Female goods	Male goods
Maximum	8.21	2.48	3.33	8.21	106	45	51	106
Median	1.56	0.64	1.73	1.84	9	3	9	14.50
Minimum	0.42	0.42	0.68	1.58	0	1	0	0
Mean	1.93	0.97	1.74	2.46	19.41	8.29	12.40	21.71
Std. Dev.	1.34	0.86	0.82	1.83	26.30	16.23	16.56	28.74
CV	0.69	0.89	0.47	0.74	1.36	1.96	1.34	1.32
N	46	5	14	17	39	7	15	17

Appendix 7.5 *Distributions of grave size (in sq. m) and number of grave goods from burials at the Yuchisi site in Anhui, late Dawenkou culture*

	All size	Juvenile size	Female size	Male size	All goods	Juvenile goods	Female goods	Male goods
Maximum	3.11	1.03	2.94	3.11	29	7	20	29
Median	0.56	0.5	0.98	1	2	1	2	1
Minimum	0.07	0.07	0.68	0.48	0	0	0	0
Mean	0.73	0.51	1.23	1.29	2.35	1.7	4.63	3.24
Std. Dev.	0.55	0.2	0.61	0.74	3.84	1.59	6.24	6.96
CV	0.75	0.39	0.5	0.57	1.63	0.94	1.35	2.15
N	185	65	15	37	192	66	16	37

Appendix 7.6 *Distributions of grave size (in sq. m) and number of grave goods from the Chengzi cemetery in Shandong, Longshan culture*

	All size	Juvenile size	Female size	Male size	All goods	Juvenile goods	Female goods	Male goods
Maximum	3.71	0.91	1.40	3.71	31	10	3	31
Median	0.80	0.49	0.93	1.10	0	1	0	1
Minimum	0.19	0.40	0.29	0.24	0	0	0	0
Mean	0.96	0.60	0.91	1.37	2.07	3	0.57	4.53
Std. Dev.	0.74	0.27	0.35	0.81	4.58	4.69	1.13	7.83
CV	0.77	0.45	0.38	0.59	2.21	1.56	1.98	1.73
N	83	3	7	19	86	4	7	19

Appendix 7.7 *Distributions of grave size (in sq. m) and number of grave goods from 0–1 interment burials at the Yangshan site in Qinghai, late Majiayao culture**

	All size	Juvenile size	Female size	Male size	All goods	Juvenile goods	Female goods	Male goods
Maximum	9.86	5.26	5.61	6.15	38	16	29	27
Median	2.25	1.94	2.73	3.14	8	9	12	12
Minimum	0.49	0.94	0.88	1.48	0	1	0	2
Mean	2.45	2.22	2.86	3.09	9.67	8.96	10.26	11.96
Std. Dev.	1.27	1.17	1.06	1.19	7.21	4.68	6.70	7.02
CV	0.52	0.53	0.37	0.39	0.75	0.52	0.65	0.59
N	182	20	38	27	184	20	38	28

* Stone beads were found clustered together in some burials, perhaps from the same ornament piece. Therefore each cluster of beads is counted as one item to avoid inflation in the total number of grave goods.

Appendix 7.8 *Distribution of number of grave goods from Huangniangniangtai in Gansu, Qijia culture*

	All grave goods	Juvenile grave goods
Maximum	94	9
Median	8	3.5
Minimum	1	0
Mean	10.92	3.83
Std. Dev.	14.63	3.66
CV	1.34	0.95
N	49	6

Appendixes 8 Summary of central places in the Neolithic and Erlitou periods

Appendix 8.1 *Summary of Yangshao central places in western Henan and Zhengzhou regions*

Site cluster	Center	Site size (ha)	Distance between central places (km)	Catchment area (km^2)
W. Henan				
	Yangjiagou	75	25 to Wudicun	
	Wudicun	45	17 to Chuankou	
	Chuankou	70	14 to Nancun	
	Nancun	60	19 to Beiyangping	
	Beiyangping	90	25 to Dongshuangqiao	
	Dongshuangqiao	80		
	Average		20	314
Zhengzhou				
	Xishan*	25	17 to Dahecun	
			15 to Chenzhuang	
	Dahecun	40	13 to Chenzhuang	
	Chenzhuang	25	20 to Chujiawan	
			20 to Fangjinzhai	
	Fangjinzhai	20	20 to Xishan	
	Chujiawan	33	13.5 to Fangjinzhai	
	Average		17	227

* Walled settlement.

Appendix 8.2 *Summary of central places in Taosi and western Henan regions, Longshan period*

Site cluster	Major center	Minor center	Site size (ha)	Distance between central places (km)	Catchment area (km^2)
Early Taosi	Taosi*		280		3300
		Qushetougou	50		
		Nanguanwai	40		
		Kaihua	128		
		Xiagao	28		
		Nanyuan	24		
Late Taosi	Taosi		300	20 to Fangcheng-Nanshi	1660
		Qushetougou	50		
		Nanguanwai	40		
	Fangcheng-Nanshi		230		1660
		Xiagao	28		
		Nanyuan	24		

* Walled settlement

Appendix 8.3 *Summary of central places in the Yiluo basin, Longshan period*

Centers	Possible centers	Site size (ha)	Distance between central places (km)	Catchment area (km^2)
Dayanghe		35	34 to Gaopingzhai 21 to Jinzhongsi	
Poluoyao		30		
	Gaopingzhai	45	27.5 to Xiwo 31 to Xigaoyai	
	Zhaiwannan	50	29 to Xigaoyai 19 to Jinzhongsi	
	Xiwo	24	29 to Dayanghe	
	Xigaoyai	21	25 to Dayanghe	
	Jinzhongsi	25	24 to Xigaoyai	
Zhangwan		20	22.5 to Jinzhongsi 19 to Zhaiwannan	
Luokou		20	17 to Zhangwan	
Average			25	491

Appendix 8.4 *Summary of central places in northern Henan region, Longshan period*

Site cluster	Center	Site size (ha)	Distance between central places (km)	Catchment area (km^2)
Western section				
Hougang	Dahannangang	56		
	Hougang*	30	52 to Xiacao	
Linxian	Daliutan	20	46 to Hougang	
Qi River	Xiacao	11	42 to Mengzhuang	
Mengzhuang	Mengzhuang*	25	36 to Ligu	
Jiaozuo	Ligu	24		
Average			44	1519
Eastern section				
Jinti River	Qiquan	11	64 to Qingdui	
Huangzhuang R.	Qingdui	13		

* Walled settlement.

Appendix 8.5 *Summary of central places in central Henan region, Longshan period*

Site cluster	Center	Site size (ha)	Distance between central places (km)	Catchment area (km^2)
Wangchenggang	Wangchenggang*	50	48 to Guchengzhai	
Guchengzhai	Guchengzhai*	25	37 to Wadian	
	Wuhumiao	35		
	Xinzhai	35–70		
Wadian	Wadian	20–50	36 to Wangchenggang	
Others	Taipu (possible center)	<75	42 to Wangchenggang	
	Houzhuang	30	37 to Wadian	
	Puchengdian	14	48 to Chenggao	
	Chenggao	20	45 to Changcun	
	Changcun	20	29 to Yangmatai	
	Yangmatai	21	25 to Haojiatai	
	Haojiatai*	7	25 to Fenghuanggang	
	Fenghuanggang	21	28 to Changcun	
	Pingliangtai*	5	63 to Fenghuanggang	
	Zhongqiugang	15	52 to Fenghuanggang	
	Average		40	1256

* Walled settlement.

Appendix 8.6 *Summary of Longshan central places in Shandong*

Site cluster	Central place	Date of walled site (BC)	Site size (ha)	Distance between central places (km)	Catchment area (km^2)
C7: Linyi	Zhangjiazhaili		75	30 to Houshengzhuang	960
	Fuchipo		49		
	Pingdunhu		30		
	Houxinzhuang		27		
	Quanyizhuang		25		
	Houshengzhuang		42		960
	Fuyizhuang		25		
Average					960
C8: Rizhao	Liangcheng		246.8		
	Dantu*	Dawenkou	9.5		
		Longshan	130.7		
C9: N. Shandong	Chengziyai*	2600–2000	20	53 to Dinggong	
		Yueshi	17	53 to Dinggong	
	Dinggong*	2600–2000	11	36 to Tianwang	
	Tianwang*	M. Longshan	15	40 to Bianxianwang	
		Yueshi	?		
	Bianxianwang*	M. Longshan	1	40 to Xizhufeng	
		L. Longshan	5.7		
	Xizhufeng		>5.4		
Average				42	1384
C10: W. Shandong	Jiaochangpu*	Longshan	33	42 to Jingyanggang	1500
		Yueshi			
	Dawei**	Longshan	3		
	Lepingpu**	Longshan	3		
	Shangzhuang**	Longshan	4		
	Wangji**	Longshan	3.8		
	Jingyanggang*	Longshan	38		1250
	Huangguzhong**	Longshan	6		
	Wangzhuang*	Longshan	4		
Average					1375
Other: N. Jiangsu	Tenghualuo*	E & M Longshan	14		

* Walled settlement
** Possible walled settlement

Appendix 8.7 *Summary of Longshan central places in Central Shaanxi*

Site cluster	Central place	Site size (ha)	Distance between central places (km)	Catchment area (km^2)
C11: L. Wei R.	Jiacun	50	42 to Tanjiacun 30 to Xiehu	
	Kangjia	19	38 to Jiacun	
	Tanjiacun	30	31 to Kangjia	
	Beiniu	20		
	Xiehu	20	34 to Tanjiacun	
	Yaojiazhai	30	25 to Jiacun 20 to Xeihu	
Average			31	754
C12: M. Wei R.	Shizuitou	50	35 to Yuanxigou	
	Yuanxigou	50	26 to Shuang'an	
	Shuang'an	40	33 to Laojuzhou	
	Laojuzhou	18	22 to Zhaojialai	
	Zhaojialai	18	32 to Baijia	
	Baijia	30	35 To Laojuzhou	
	Tianfu	21	45 to Qijiabao	
	Qijiabao	24	15 to Zhaojialia	
	Xigaoquan	20		
Average			30	707
C13: Jing R.	Nanpotou	50	20 to Fuchi	
	Fuchi	40	25 to Dongyuan	
	Dongyuan	45	20 to Zhangjiahe	
	Zhangjiahe	45		
	Zhanghe	45		
	Liuyu	30	26 to Yanbeihou	
	Yanbeihou	24	18 to Dongyuan	
	Machang	30		
Average			22	380
C14: Hancheng	Heyang	60		
	Gelao	60	34 to Heyang	
	Liufang	38	34 to Heyang	
	Chenjiacun	40		
Average			34	907

Appendix 8.8 *Summary of Erlitou central places in Henan, Shanxi, Shaanxi, and Hubei*

Site name	Region	Site size (ha)	Distance to Erlitou (km)
Erlitou (1)	Yiluo	300	
Shaochai in Gongyi (2)	Yiluo	60	20
Fucun in Yima (2)	Yiluo	40	76
Luokou in Gongyi (3)	Yiluo	15	
Huizui in Yanshi (2)	Yiluo	25	15
Xikouzi in Yanshi (3)	Yiluo	18	
Nanzhai in Yichuan (2)	Yiluo	25	37
Quliang in Xinmi (2)	Central Henan	22	88
Shidao in Tengfeng (2)	Central Henan	25	70
Dongxiafeng in Yuncheng (2)	South Shanxi	25	150
Nanguan in Yuanqu (2)	South Shanxi	unknown	100
Ganjuncun in Yixian (2)	South Shanxi	20	160
Donglongshan in Shangluo (2)	East Shanxi	20	270
Panlongcheng in Huangpi (2)	Hubei	20	500

(1) primary center; (2) secondary center; (3) tertiary center.

Appendix 9.1 *Neolithic walled settlements in Henan*

Site	Size of enclosure (ha)	Date (BC)
Xishan	25	3300–2800
Hougang	unknown	2500–2300
Mengzhuang	16	2400–2100
Wangchenggang	1	2455–2280
Guchengzhai	17	2300–2000
Pingliangtai	3.4	2550 ± 140 (WB83–53)
Haojiatai	3.3	2656 ± 121 (DY–K0187)

Appendix 10.1 *Summary of settlement data from Yangshao to Longshan in the Central Plains*

Period	Cluster	Level of settlement hierarchy	Size of largest site (ha)	Distance between central places (km)	Estimate average territorial size (km2)	Settlement pattern
Yangshao	W. Henan	2–3	90	20	314	Multi-centered
Yangshao	Zhengzhou	2	40	17	227	Multi-centered
Longshan	Early Taosi	3	280	N/A	3300	Mono-centered
Longshan	Early Taosi	2–3	40	25	491	Multi-centered
Longshan	Early Taosi	2–3	56	44	1519	Multi-centered
Longshan	Early Taosi	2–3	50	40	1256	Multi-centered

Appendix 11.1 *Data of Neolithic and Yueshi sites from twenty-nine counties/cities in Shandong*

Region	Beixin	Dawenkou	Longshan	Yueshi	Reference
N. Shandong					
Zouping	1	2	17	3	KG89.6:505–23
Changle	0	22	60	7	KG87.7:577–85
Zhangqiu	3	10	42	30	Zhang 93a:21
Zibo	2	3	13	0	HDKG89:6–23
Shouguang	0	14	62	6	HDKG89:29–60
Linqu	0	5	36	6	HDKG89:202–16
Qingzhou	1	20	76	9	HDKG89:124–40
Subtotal	7	76	306	61	Sum: 450
E. Shandong					
Haiyang	0	8	11	2	KG85.12:1057–67
Haiyang, etc.	0	2	5	1	KG83.3:193–216
Subtotal	0	10	16	3	Sum: 29
SW. Shandong					
Tengxian	2	25	32	0	KG80.1:32–44
Zaozhuang	0	13	18	3	KG84.4:289–301
Zouxian	0	11	13	0	KGJK83:98–108
Sishui & Yanzhou	3	7	14	0	KG65.1:6–12
Qufu	2	6	19	0	KG65.12:599–613
Weishan	0	3	2	0	KG95.4:313–18
Jining	0	7	6	0	KG83.6:489–95
Juye, etc.	0	6	70	20	Zhang 1996b
Subtotal	7	78	174	23	Sum: 282
SE. Shandong					
Liangcheng	0	4	199	6	KG02.5:10–18
Zhucheng	0	5	23	5	HDKG89:225–36
Linyi	0	19	113	10	KG92.2:875–93
Tancheng	0	6	11	0	KG95.8:678–85
Feixian	0	7	5	2	KG86.11:966–76
Subtotal	0	41	351	23	Sum: 415
NW. Shandong					
Liaocheng	0	7*	32	6	KGJK91:1–22 HXKG96.4:19–26
Pingyin	2	4	11	8	KGWW01.5:3–18
Xinyang	0	1	3	2	HXKG02.4:39–47
Subtotal	2	12	46	16	Sum: 76
Total	16	217	893	126	Total: 1252

* Including Dawenkou and Yangshao sites.

Codes: KG = *Kaogu;* HDKG = *Haidai Kaogu;* KGJK = *Kaoguxue Jikan;* HXKG = *Huaxia Kaogu;* KGWW = *Kaogu yu Wenwu.*

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