EMERGENT COMPLEXITY ON THE MONGOLIAN STEPPE:
Mobility, Territoriality, and the Development of Early Nomadic Polities

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It is now well recognized that mobile herding subsistence patterns do not preclude the development of complex social organization, but debate continues over whether the development of such societies depends upon and requires interaction with already existing agricultural state-level societies. This is known as the 'dependency' hypothesis. In the Mongolian case this debate centers on the Iron Age Xiongnu (ca. 209 BCE to 93 CE) and whether this polity of mobile herders resulted from indigenous political processes or from the influence of or interaction with sedentary agricultural neighbors to their south.

In order to evaluate this, a number of concrete lines of inquiry are investigated in the present study through regional archaeological survey and small-scale excavations of fourteen Late Bronze Age (mid-second to mid-first millennia BCE) domestic contexts in a remote region far from the direct intersection with centers of power such as China, but where numerous monumental structures suggest complex social organizations, so as to investigate the *early* development of societal complexity in Mongolia and systematically and empirically evaluate the core variables and problematic aspects related to the development of 'nomadic' polities (i.e.

those stated in the dependency hypothesis), namely demography, subsistence, mobility, and political economy in relation to higher degrees of sociopolitical organizations.

Results of the present study upend some of the ideas tied to the dependency hypothesis and suggest that while clear social hierarchies have not been identified within domestic contexts there does seem to be some level of social differentiation during the Late Bronze Age. Based on this evidence and the evidence from the impressive ritual and funerary monumental landscape, it is suggested that this period may represent the first stage in the emergence of political organization operating beyond the descent group and that relatively complex forms of sociopolitical organization among mobile pastoralists can and did indeed develop in remote regions far from the direct intersection with powerful sedentary agricultural state-level societies. Accordingly, it is also suggested that some of the foundations of Early Iron Age complex sociopolitical organization in central Mongolia were already being laid locally during the preceding Late Bronze Age.

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To Gaëlle and Salomé

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1.0 INTRODUCTION

1.1 THE RESEARCH PROBLEM

The trajectories that led relatively egalitarian societies to more complex forms of societal organization are still the subject of much research and debate. Among the issues that have received the least consensus among scholars, even within the 'non-evolutionary' tradition, remain those addressing the causal factors of the emergence of inequality and its subsequent institutionalization. This is especially true for the study of the early development of societal complexity among mobile herders (Barfield 1981, 1989, 2001; Burnham 1979; Di Cosmo 1994, 1999, 2002; Irons 1974, 1979, 1994; Khazanov 1994; Koryakova 1996, 2002; Kradin 1994, 1995, 2002; Kuzmina 2000; Lattimore 1962; Markov 1978; Salzman 1967, 1999 [for a general discussion], 2000, 2004; Vainshtein 1980; and others). While it is now recognized that a pastoral mode of subsistence does not preclude the development of complex forms of societal organization, there is still debate regarding whether the development of hierarchical nomadic polities can result from internal dynamics alone or if their development is necessarily contingent on external factors of social change, notably those generated by the interaction with already-existing sedentary agricultural state-level societies (Barth 1961; Bates 1971; Burnham 1979; Irons 1971, 1974, 1979, Krader 1979, also see Salzman 1999 for a recent discussion). This debate is presently best illustrated by the Mongolian case where current hypotheses differ as to whether such polities as the Iron Age Xiongnu (ca209 BCE to CE 93) arose as the result of

indigenous political processes or from the influence of sedentary neighbors. Yet, while considerable historical research has been dedicated to the question of how and why mobile pastoralists such as the Xiongnu developed state-like polities (e.g. Barfield 1981, 1989, 2001; Di Cosmo 1994, 1999, 2002; Jagshid and Symons 1989; Khazanov 1978; Kradin 2002; Lattimore 1992 [1940]), little archaeological research has been devoted to empirically evaluating the actual roots and developmental processes of political authority in this region (but see Honeychurch 2004). To be sure, there is still little consensus among scholars concerning the nature and social organization of the Late Bronze Age[1] groups that preceded these large-scale Iron Age state-like nomadic polities (e.g. Allard 2006; Allard and Erdenebaatar 2005; Erdenebaatar 2002; Honeychurch 2004; Honeychurch et al. 2009; Tsybiktarov 1995, 1998, 2003; Volkov 1967; Wright 2006, 2007). In order to address these issues, this study investigates the *early* development of societal complexity in Mongolia by focusing on a remote region far from the direct intersection with centers of power such as China, but where numerous monumental structures suggest the emergence and development of a distinctive cultural phenomenon that appears to reflect changes in social relations and a transition in what sort of social status existed (Figure 1.1). More concretely, this work explores the nature of the social and economic organization of Late Bronze Age societies of central Mongolia, a region that many believe was occupied at the time by mobile pastoralists, so as to evaluate the nature of societal complexity during this pivotal period in Mongolian history.

[1] The term "Late Bronze Age" refers broadly here to the mid-second to mid-first millennia BCE. Although the date usually assigned to the Early Iron Age in Central Asia is the beginning of the first millennium BCE, iron metallurgy only developed in Mongolia from the middle of the first millennium BCE (DiCosmo 2002:71; Askarov et al. 1992).

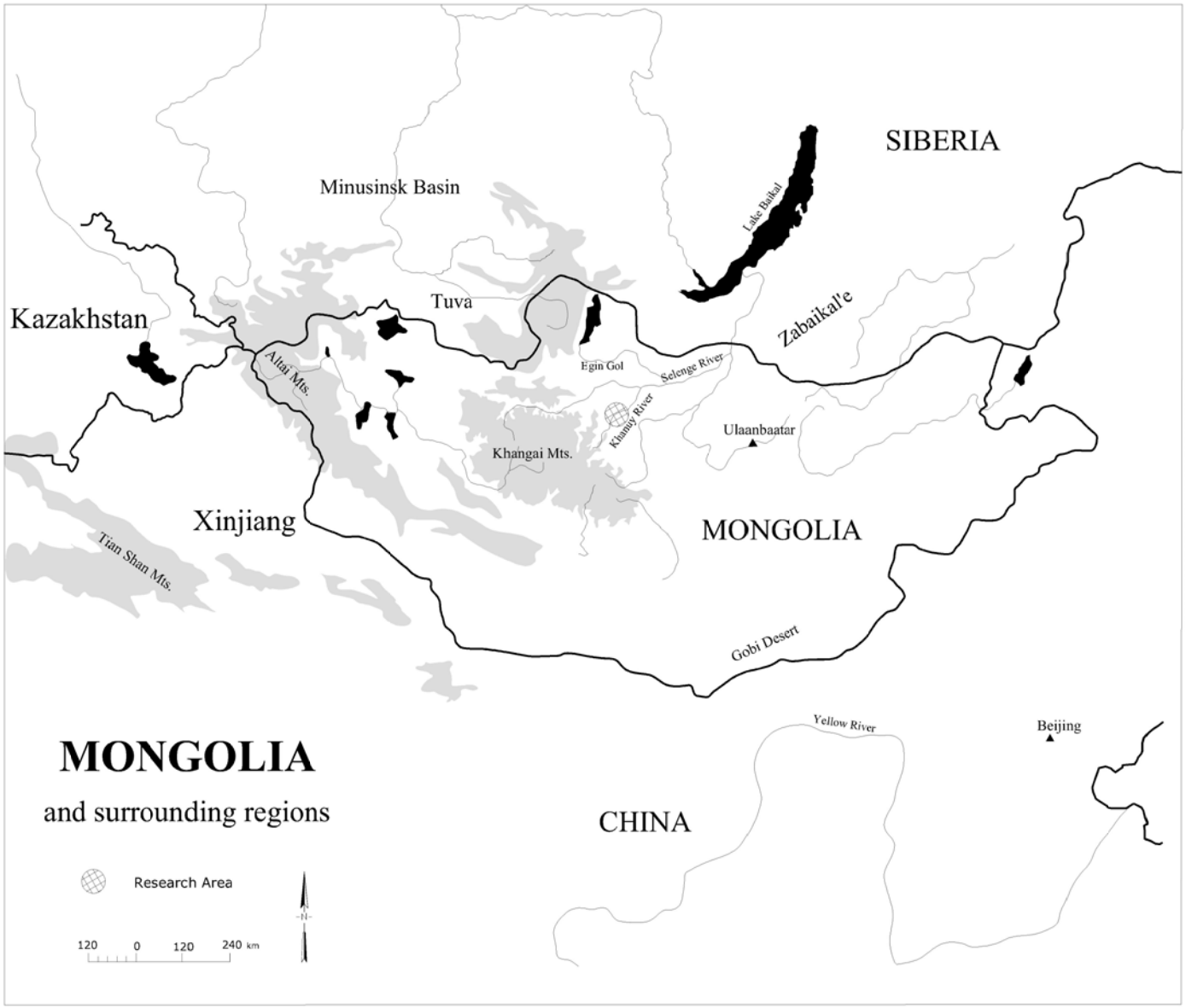

Figure 1.1 Mongolia and surrounding regions.

1.2 CONTEXTUALIZING MONGOLIA'S LATE BRONZE AGE

Research in central Mongolia has documented the broad chronological sequence of the archaeological record which covers the Late Neolithic/Early Bronze Age through the Buddhist periods (Table 1.1). Little is known of Mongolia's Neolithic period, yet the presence of grinding stones, pestles, and other agricultural paraphernalia in eastern and northern Mongolia, southern Siberia and the central provinces of Mongolia have suggested to some the presence of scattered farming communities (Derevyanko 1994; Derevyanko and Dorj 1992; Di Cosmo 1994; Grishin 1981; Volkov 1964). The earliest data thus far concerning the transition to an animal husbandry economy in Mongolia dates to the Late Neolithic and Eneolithic Periods (5th to Early 2nd millennium BCE) (Okladnikov and Derevianko 1970; Séfériadès 2004; Volkov 1995). This transition has been especially well documented at the site of Tamsagbulag (Dornod *aimag*) in eastern Mongolia where the subsistence economy seems to have been based on agriculture and cattle-breeding, as well as hunting-fishing-gathering (e.g. millet, large fish, bird, cattle, pig, horse, etc.) (Dorj 1969, 1971; Okladnikov and Derevianko 1970; Séfériadès 2004), while in northern Mongolia and in the Altai and Khangai Mountains—the regions of interest to the present study—this transitional period is essentially typified for the moment by the emergence of the Afanasievo Culture (Volkov 1995; Kovalev 2008). In these regions, subsistence economy was apparently based on a combination of hunting and cattle-breeding (cattle, sheep/goat, and horse), burials consisted of relatively poorly furnished circular or rectangular shaped tumuli in which two or more individuals were interred (usually only males and children), and settlements were insubstantial—often interpreted as seasonal camps (Mallory 1989:223-25). However, aside from occasional undated finds of microliths and very coarse low-fired ceramics, no evidence for

Afanasievo-related features – or other clear Late-Neolithic/Early Bronze Age features – has definitively been identified in the northern Khangai region of central Mongolia (but see Wright 2006 for some possible evidence in the adjacent Egiin Gol Valley in northern Mongolia).

The Late Bronze Age—the focus of this study—corresponds to the heyday of monumental construction in Mongolia, which in turn suggests a more complex pattern of social organization. In fact, while Mongolia is commonly considered as a "peripheral" area in early steppe sociopolitical dynamics, some of these monuments surpass in aboveground elaborateness anything else of this nature in the Bronze Age steppe. Moreover, their appearance at the end of the second millennium BCE is highly significant in that they precede the first large scale Iron Age mortuary sites of Arzhan I and II in Tuva (9th-8th century BCE) (Bokovenko 1995a,b; Gryaznov 1980), and other so-called Scythian Period royal burials in the Eurasian steppes.

Chronologically, Mongolia's Late Bronze Age broadly corresponds to the better known Karasuk and Tagar periods in the Minusinsk Basin of southern Siberia (ca.1400-300 BCE) (Bokovenko 2006; Legrand 2006; Novgorodova 1989; Volkov 1995) (Table 1.1). Interestingly, while it is fairly well recognized that the Iron Age Tagar cultural phase in the Minusink Basin descends from the Late Bronze Age Karasuk cultural phase (Leont'ev et al. 1996; van Geel et al. 2004), some characteristic artistic elements found during the Late Bronze Age period in central Mongolia, such as the images of stylized deer with bird-like beaks and backward-flowing antlers found on what are commonly known as 'deer stone' stelae (*Olenniye Kamni*) (Figure 1.2), actually predate those found during the Tagar period (Figure 1.3). Indeed, newly produced dates from ritual features directly associated with deer stones in central and northern Mongolia (Fitzhugh 2005) are now showing that these structures (at least the Mongol-Transbaikalian form) not only belong at least to the Late Bronze Age—a sequence intuitively anticipated by Volkov

before the production of absolute dates (Volkov 1981)—but they are also consistently 200-300 years earlier than dates from Arzhan and other so-called early Scythian-related sites in southern Siberia and central Asia (Fitzhugh 2009; Sementsov et al. 1998). In addition, a fragment of a deer stone has recently been found in the fill of a Late Bronze Age *khirigsuur* mound (a Mongolian type of kurgan mound) in Ulaan Uushig I (Khovsgol *aimag*, northern Mongolia), thus supporting this chronology (Takahama 2003). This is not without significance, since the Tagar culture has been argued as belonging to the earliest stages of the Iron Age Scythian period/horizon (Bokovenko 2006). Consequently, it may be that some of the characteristic elements of so-called "Scythian" art actually have their origin in Late Bronze Age Mongolia. This, together with the impressive early *khirigsuur* mounds to be discussed later, is significant not only because of its important implications on debates regarding the earliest appearance and development of this widespread deer motif (and related 'animal style') within Eurasia, but mostly for its important implications for the *early* development of complex social and religious organization in this region of the world. Indeed, while there are no other Early Iron Age barrow sites in the eastern steppe that compare in scale and elaborateness to Arzhan I and II, and while there are no Late Bronze Age burials of a similar or transitional type in southern Siberia (Bokovenko 1996), the structure of Late Bronze Age *khirigsuur* mounds in Mongolia, and notably their satellite ritual features, foreshadow what is seen several centuries later at the important Arzhan sites (Čugunov et al. 2004; Rolle 1989:43; Semenov 2002).

Table 1.1 Chronological divisions with related archaeological cultures of interest discussed in this text.

General Chronology	Archaeological Cultures of Interest in this Study	Dates
Upper Paleolithic		38000 – 13000 BCE
Epi-Paleolithic		6000 – 3500 BCE
Neolithic		3000 – 2000 BCE
Early Bronze Age		3500 – 1600 BCE
Bronze Age		1600 – 1000/800 BCE
Late Bronze Age	Karasuk Culture	1400 – 1000/800 BCE
	Khirigsuur and Deer Stone Culture	**1300 – 700 BCE**
Terminal Bronze Age/Early Iron Age	Tagar Culture	800 – 300 BCE
	Slab Burial Culture	800 – 400 BCE
Iron Age	Xiongnu	300 BCE – AD 200
Turk		7th – 9th AD
Uighur		10th – 11th AD
Medieval		11th – 14th AD
Manchu/Buddhist		17th – 20th AD

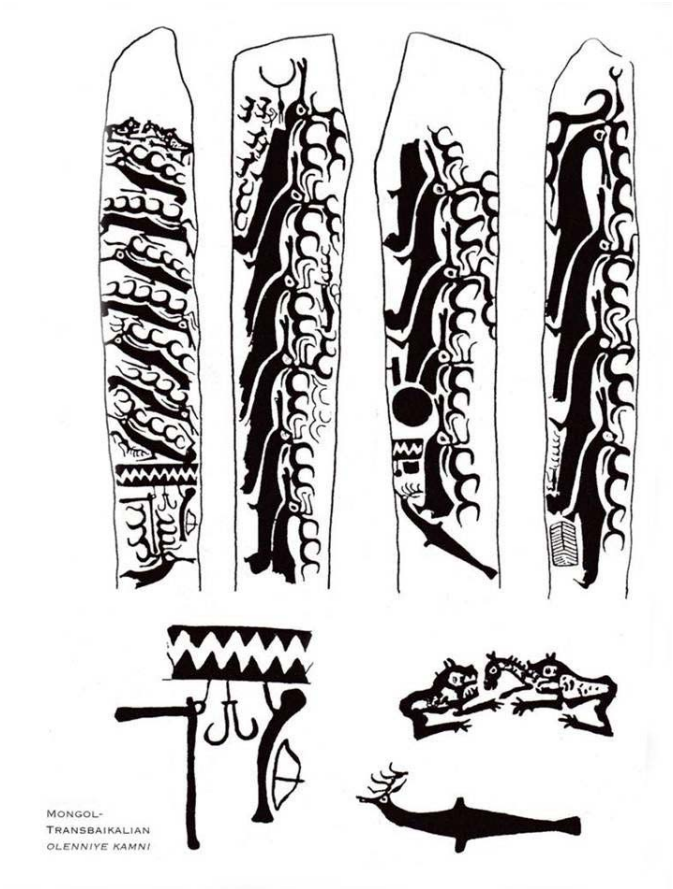

Figure 1.2 Mongol-Transbaikalian Deer Stone (from Volkov 1995).

Figure 1.3 Bronze plaques in the form of deer (Minusinsk steppes, Tagar culture – 4th-3rd century BCE) (from Gryaznov 1969).

Regardless, by the end of the first millennium BCE, there appeared a 'new' organizational form that was emerging across the northeastern steppe. Although its origins can probably be traced earlier, it is essentially during the time of China's Warring Kingdoms (475-221 BCE) that Chinese histories (*Hanshu* and *Shiji*) first mention devastating conflicts with a large-scale regionally integrated and militarily powerful steppe polity known as the Xiongnu. As mentioned earlier, the origin(s) of the Xiongnu and the context in which the Xiongnu 'empire' (or confederacy) rose is still a question of debate (Barfield 1989, 2001; Di Cosmo 1999, 2002;

Jagchid and Symons 1989; Krader 1979; Kradin 2002; Miniaev 2001; Yamada 1982), but by the end of the third century BCE, at the time of Qin Shihuangdi's unified China (221-207 BCE), the Xiongnu had expended its power to occupy the Ordos region of China's northern frontier. From 200 BCE onwards, the defining feature of steppe history became the rise and fall of different hierarchically organized and integrated polities of mobile herders (Di Cosmo 2002). The question remains, however, as to whether these developments arose, at least in part, as the result of indigenous political processes or from the influence of sedentary neighbors.

1.3 NOMADIC 'POLITIES': THE PROBLEM IN DETAIL

The tendency for pastoral groups to exploit marginal environments through high mobility and spatially extensive economies, resulting in very low population densities and unstable surplus production, has led many scholars to argue that nomadic pastoralism is not conducive to political centralization nor to the emergence of institutionalized social hierarchy without regular interaction with already-exiting sedentary agricultural state-level societies. This is often referred to as the "dependency" hypothesis (Barfield 1981, 1989, 2001; Burnham 1979; Irons 1979; Jagshid and Symons 1989; Khazanov 1978; Krader 1979; Kradin 2002; Lattimore 1992 [1940]; Sahlins 1968). Accordingly, without such interaction with sedentary societies, pastoralists are expected to form at most "egalitarian" polities (Burnham 1979; Irons 1979; Salzman 1999, 2000, 2004).

The Mongolian case, however, is particularly perplexing in this regard, since impressive Late Bronze Age (mid second to mid first millennia BCE) ritual and funerary monuments suggest the appearance and development of early complex societal structures that exhibit some

sort of formalized social differentiation at a time before regular interaction with large sedentary states in China existed. Nevertheless, there is currently very little other preserved material evidence, such as grave goods, that correlates specifically with social status or political authority. Consequently, the social organization of these Late Bronze Age groups continues to be controversial, and the nature and extent of social differentiation uncertain.

1.4 THE SOCIOPOLITICAL ORGANIZATION OF LATE BRONZE AGE SOCIETIES: THE PARADOX

Indeed, the critical peculiarity of these Late Bronze Age societies is that their monumental structures suggest organized labor investments, differential mortuary treatment for some individuals, hints of incipient hereditary principles, and supra-local centralized organization consistent with a hierarchical political structure, yet other formal indicators usually characteristic of 'ranked' societies such as increase in population density, socioeconomic centralization, complex technologies, increase in structural and functional specialization are apparently missing (cf. Kradin 2002; see also Johnson and Earle 2000). Yet, because little systematic research has been devoted to features other than monumental structures, for the most part looted, the scale and nature of these societies remain, for the most part, at the hypothetical level. Nonetheless, without delving deeper into the problem, we can neither altogether avoid considering the 'built environment', what Edward T. Hall called the "fixed-feature space", that is, one of the basic ways of organizing the activities of individuals and groups in space (1966:103). What follows is an overview of this Late Bronze Age monumental landscape in central Mongolia and the way it has been interpreted.

1.5 THE SIGNIFICANCE OF LATE BRONZE AGE MONUMENTS: A QUESTION OF DEBATE

The monumental public works and mortuary complexes of the Late Bronze Age, notably the impressive *khirigsuurs*, along with 'slope' burials, deer stone stelae, and 'slab' burials, have suggested the early development of societal and political complexity in central Mongolia. Attention has focused especially on the *khirigsuurs*, a Mongolian version of the *kurgans* known from farther west, and consisting of massive central mounds of stones that cover a central cist, surrounded by square or circular 'fences' of surface stones, and satellite features (stone mounds and stone circles) which contain, respectively, complex deposits of remains of horses and cremated bone fragments of unidentified animals (Figure 1.4) (Allard and Erdenebaatar 2005; Allard et al. 2006). Interestingly, as noted before, this type of monument is similar in structure, and apparently in function to some extent, to what is found in slightly later times at both Arzhan I and II in Tuva, although the latter are much more elaborate (Čugunov et al. 2004; Rolle 1989:43; Semenov 2002). Indeed, a stone 'fence' and several (n= >200) stone mounds and stone circles (ca. 2-3 meters in diameter) have been found around these monuments (Rolle 1989:43). The satellite features at Arzhan I contain predominantly head and metapodial elements of sheep, goats, cattle and horses (similar to what is found in stone mounds at *khirigsuurs*, although these have only horse elements), while those at Arzhan II have been found to contain calcined bone fragments of various livestock (similar to what is found in stone circles at *khirigsuurs*). As is the case for their counterparts in Tuva, these types of remains found at *khirigsuurs* suggest wide-scale feasting and clearly speak to the significance of ritual activity at these sites. Moreover, the

early and widespread distribution of these funerary complexes in Mongolia signals the emergence of new complex social institutions and commemoration in this part of the world.

The conventional interpretation of Eurasian kurgans (Grach 1980; Khazanov 1975), given by a number of scholars, have suggested that *khirigsuurs* reflect the social place of the deceased as a member of a hereditary elite (e.g. Erdenebaatar 2002; Tsybiktarov 1995, 1998, 2003; Volkov 1967). Very few *khirigsuurs* have been excavated, and most were previously looted, but when human remains are found within the central cist of these monuments, these consist in single human inhumations of both adults and sub-adults (Erdenebaatar 2002; Takahama 2005; Tsybiktarov 1998), suggesting hereditary ranking (i.e. ascribed status).

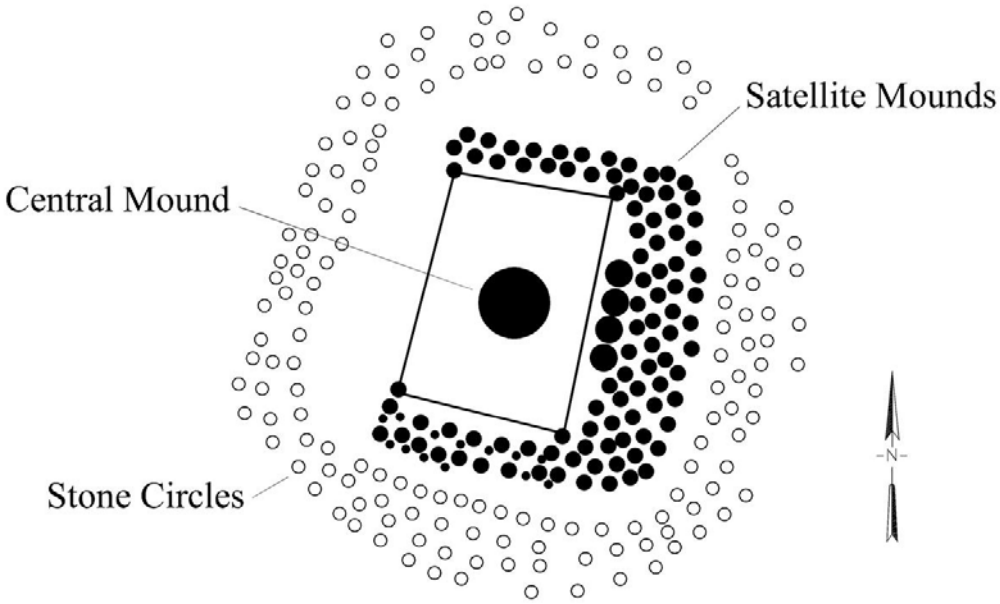

Figure 1.4 Photo and schematic drawing of a *Khirigsuur*.

‘Slope’ burials, which are small graves without prominent tumuli or animal ritual deposits that occur in cemetery groupings along hill slopes, are taken to represent lower-ranking members of society (Figure 1.5). This less monumental Late Bronze Age burial custom, unfortunately, is rarely considered in discussions concerning the social organization of Bronze Age Mongolia or is conflated into analyses of *khirigsuurs* proper because of their similar structure, a practice not unlike the one found in the rest of Eurasia where the term ‘kurgan’ is generically used to designate any type of burial mound. Here, however, I distinguish between ***khirigsuurs*** proper (a ritual/funerary structure consisting of a massive central mound of stones, surrounded by a square or circular ‘fence’ of surface stones, and satellite features with complex deposits of remains of horses and other domesticated animals) and **‘slope’ burials** (usually small graves also surrounded by a square or circular ‘fence’ of surface stones, but without prominent tumuli and with no or very few animal ritual deposits). Although there is much variability and occasionally some architectural overlap between these different types of monuments, the most distinguishable and important characteristic I see between these two types of monuments, especially in terms of social function, is the presence or not of peripheral ritual activity which suggests or not large group participation. Both types are usually found together, and date to the same period of time, that is, between ca. 1300 BCE and 700 BCE (Allard and Erdenebaatar 2005; Fitzhugh 2009; Frohlich, personal communication). Contrary to most *khirigsuurs*, however, ‘slope’ burials are located in direct association with contemporaneous habitation sites (apparently winter/spring campsites if compared to local ethnographic patterns and seasonality studies – see chapter 5), thus suggesting “household”/encampment burials. Accordingly, this two-tier burial tradition suggests that social distinctions, at least in death, were drawn in space.

Figure 1.5 'Slope' burials.

The social function of deer stones remains an enigma, but the variable belt styles, chevron motifs, and toolkits depicted on the stelae suggest reference to a particular individual, possibly a warrior or a chief (Dikov 1958; Erdenebaatar 2004; Jacobson 1993; Magail 2003; Volkov 1981). Some rare stelae do have a human face carved on the upper portion (Figure 1.6), but most only depict some of the elements that appear on the top section of these anthropomorphic stones, that is, what appear to be a necklace and earrings/sun motif (Volkov 1981; Novgorodova 1989). The imagery and its style of presentation also parallels tattooed shamanistic elements or components found in shaman's ritual clothing (Bayarsaikhan 2005; Novgorodova 1975; Purev 1999:19; Savinov and Chlenova 1978; Volkov 1981) (Figure 1.7), but this should not be surprising since, as in traditional Mongolia, a clan chief was sometimes both political leader and shaman (Jagchid & Hyer 1979:171).

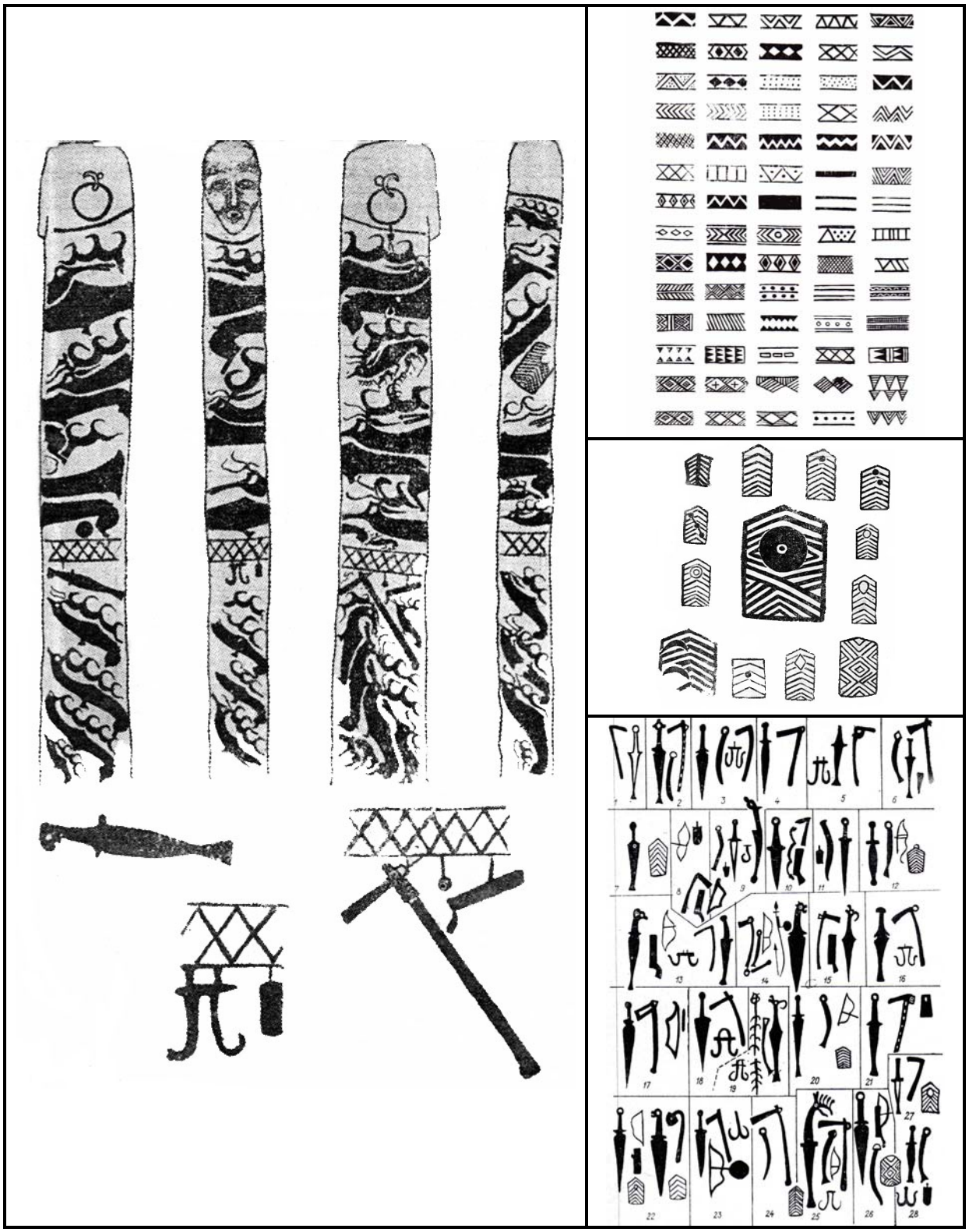

Figure 1.6 Deer stone imagery including (from top to bottom on right side) different belt styles, chevron motifs and toolkits/weaponry (from Volkov 1981 and Novgorodova 1989).

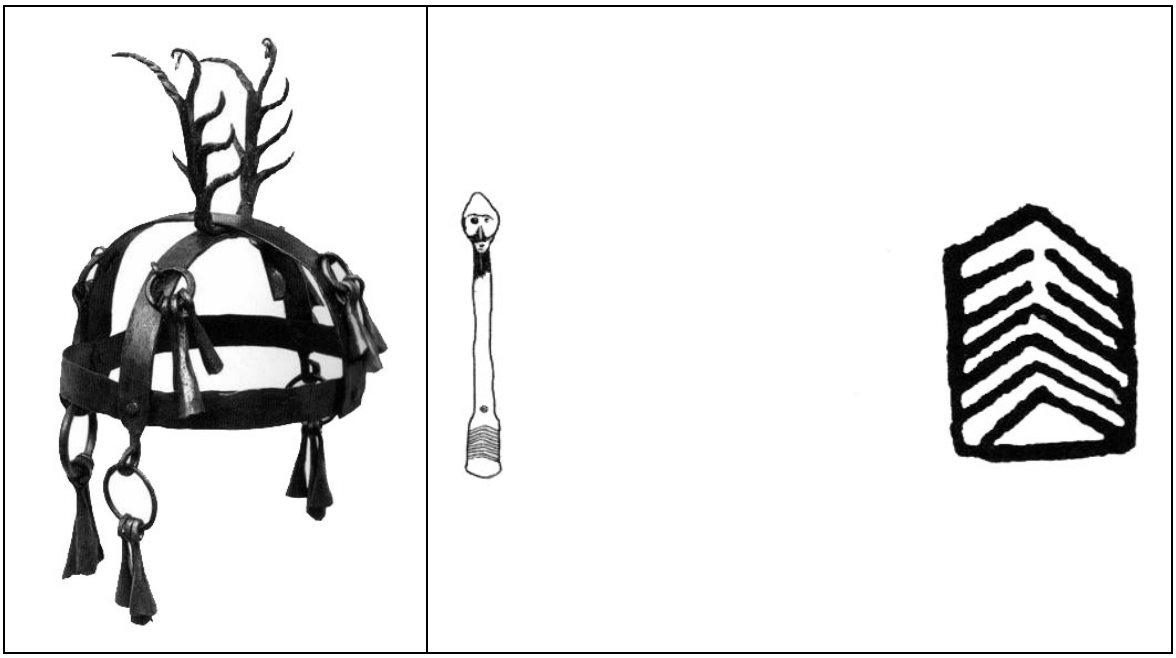

Figure 1.7 Shamanistic elements found on deer stones (from left to right: shamans 'crown' [from Savinov and Chlenova 1978] and shamanistic figure with chevron motif from *Bayan Ulgii* [from Bayarsaikhan 2005]).

By the very Late/Terminal Bronze Age, although there is some evidence of chronological overlap between these monuments (Honeychurch 2004; Tsybiktarov 1998), slab burials are accompanied by animal remains (horse bones in particular), cowries and mother-of-pearl (suggesting long-distance trade), and bronze tools, hunting implements, weapons, bronze helmets, ornaments, and horse trappings (Erdenebaatar 2002:151-203, 239-52; 2004; Ishjamts 1994:151-2; Volkov 1995:321) (Figure 1.8). In addition, recent research in northern Mongolia has suggested that some sub-adults were provided with larger burials and more elaborate offerings than some older individuals (Honeychurch 2004:126), a further indication of hereditary ranking (Peebles and Kus 1977). Slab burials are frequently located in close proximity to *khirigsuurs*, sometimes within the confines of these larger structures, thus suggesting either some type of connection to or co-option on the part of the peoples associated with these monuments.

Khirigsuurs, while apparently emphasizing individuals (i.e. single inhumations), are nonetheless the only monuments to clearly exhibit important communal ritual activities (Houle et al. 2004; also see Koryakova 1996:256 for a similar pattern in the Southern Urals during the Bronze Age).

Figure 1.8 Slab burial.

Alternatively, it has been argued that *khirigsuurs* lack clear patterns of status differentiation when considering factors such as the lack of grave goods, spatial layout, and overall geographical distribution (Allard 2006; Allard and Erdenebaatar 2005). Human remains are occasionally absent from the central cist, which has led some to label them 'ceremonial' rather than mortuary structures (Honeychurch 2004; Jacobson 1993; Wright 2006), and to see the societies that built them as acephalous mobile pastoral groups of a corporate kind (Allard 2006). However, these 'empty' mounds could be the result of poor preservation, as very few human remains are

found in either slope burials or slab burials as well. Of the six 'slope' and slab burials excavated in the Khanuy River Valley region of central Mongolia, for example, half were empty. Those in which human remains were found only contained a few badly preserved and often fragmentary bones (Allard 2004, n.d.). In one instance only lower leg bones were found, while the skeletal remains from another burial were less than five percent complete and was represented only by a few frontal cranium bones (Houle 2008, n.d.). Apparently, this is often the case in other regions of Mongolia as well (Erdenebaatar 2002:52; Honeychurch, personal communication; Frohlich, personal communication). It could also be argued that some of these 'empty' mounds may have been cenotaphs, as the size and structural organization of the central cists are commensurate to ones containing human remains (see descriptions by Erdenebaatar 2002; Takahama 2004; personal observation; and also see Ionesov 2002 and Kroll 2000 on the topic of cenotaphs in the Eurasian steppes). Nonetheless, although arguing for the possible emergence of hereditary inequality during the very late Bronze Age, Honeychurch et al. (2009) suggest that *khirigsuurs* represent collective ceremonial events for negotiating such things as alliances, marriage agreements, resource distribution and access, and points of conflict. Once again, no permanent leader is postulated to have organized these events, while role distinctions between participants likely comprised ritual coordinators, local group members, and non-local group members.

These interpretations, based almost exclusively on the unsystematic study of mortuary remains (for the most part looted) and ritual landscapes, need to be further evaluated through the use of more direct sorts of evidence of social status, political authority, and economic specialization that might come from the investigation of residential remains—the focus of this study (see Kohl 2007:247 for a similar argument). To be sure, while the monumentality of *khirigsuurs* and other Bronze Age burials suggests organized labor and perhaps differential

mortuary treatment for some elite individuals, they still present insufficient evidence regarding the sociopolitical organization of steppe groups during this period (Tsybiktarov 1998). Significantly, the lack of data on habitation sites and their regional distribution makes assessments of population size, subsistence practices, degrees of mobility, and territorial behavior highly speculative, and all these things are vital to discussions of socioeconomic and sociopolitical systems among mobile herders (Casimir and Rao 1992; Irons 1979)—especially in regard to the assumptions tied to the 'dependency' hypothesis. Consequently, the relevant prior question to be answered has less to do with debating *why* these societies are (or are not) complex, but *how* or in what ways they are complex. In order to accomplish this, a number of concrete lines of inquiry are investigated in this study so as to systematically and empirically evaluate the core variables and problematic aspects related to the development of 'nomadic' polities (i.e. those related to the dependency hypothesis), namely demography, subsistence, mobility, and political economy in relation to higher degrees of sociopolitical organization during the Late Bronze Age in central Mongolia. Specifically, 1) What was the demographic and spatial scale of these societal organizations at the local and sub-regional levels? 2) What was the nature of subsistence practices? That is, what exactly was the herd composition? And beyond herding, is there any evidence of other complementary subsistence practices such as agriculture, plant cultivation or intense use of wild fauna? 3) What was the degree and scale of residential mobility (seasonal movement)? 4) Is there any evidence for higher status and/or specialist campsites? If so, what was the degree and nature of social and/or economic differentiation? and 5) If there is evidence for higher status and/or specialist campsites, do they tend to concentrate in areas near *khirigsuurs?*

1.6 THE RESEARCH REGION

The Khanuy River Valley is particularly well suited for answering these questions about central Mongolian Bronze Age society, as well as for investigating whether political centralization and complex political institutions among mobile pastoralists could have arisen without the influence, or at least the direct influence, of sedentary state-organized neighbors (cf. Burnham 1979; Irons 1979; Salzman 1999, 2000). Located to the north of the Khangai (*Hangai*) mountain range in Arkhangai *aimag*, the Khanuy River valley research area (N48°05'/E101°03') is part of the extensive non-urbanized grasslands of present-day north-central Mongolia, a remote region far from the direct intersection with centers of power such as China (Figure 1.1), but where numerous monumental structures dating to the period of interest dot the landscape. The valley, whose width varies between 3 and 5 km, is bordered by mountain ranges that rise some 200 – 400 m above the valley floor, itself lying at an altitude of about 1650 m above sea level (Figure 1.9). Treeless grasslands cover the valley floor and much of the hill slopes, with wooded areas (mixed pine, larch, and birch forest) typically found at elevations above 1700 m. Khanuy River, the major river in the valley, is in reality a meandering stream no more than 15 m wide during the summer that originates from the *Khangai nuruu* mountain range, the second-highest mountains in Mongolia after the Altai range. Meandering at an average elevation of 1660 m above sea level and flowing in a general south-north axis, it crisscrosses a usually unconsolidated coarse-grained alluvium area characteristic of grasslands in central Mongolia.

Figure 1.9 View of the Khanuy River Valley.

1.6.1 Climate and Environment

In terms of climate and environment, geochemical records from lakes in the Khanuy Valley (Strano et al. 2007), as well as sedimentological evidence and pollen analysis suggest that between 3570 and 2250 years ago the climate was more humid (Peck 2000) and that grasslands were expanding, thus increasing the volume of grazing possible—a condition that also characterized the surrounding regions of Lake Baikal (Feng 2001; Horiuchi et al. 2000; Karabanov et al. 2000; Peck et al. 2002), the Egiin Gol-Selenge Valley (Prouse 2005) and the Minusinsk Basin (Bokovenko 2006:863, Fig.2; Koulkova 2003:255-74; Legrand 2006:855; van

Geel et al. 2004). Noteworthy, as mentioned earlier, this period (the Late Bronze Age) corresponds to the heyday of monumental constructions in central Mongolia and contradicts the generalized view in Eurasian archaeology that the transition between the Bronze Age and the Early Iron Age (ca.1000-800 BCE) was set against a background of ecological stress linked to a so-called arid phase, which is said to have contributed at least in part to the collapse of Late Bronze Age cultures, and which in turn would have set off mass westward migrations and changes in basic economic activities (e.g. Koryakova and Epimakhov 2007:211; Kurochkin 1994, cited in Koryakova and Epimakhov 2007:211). In fact, and by way of comparison, the abovementioned environmental data for Mongolia and the surrounding northern regions now clearly show that the environmental conditions that prevailed during the Late Bronze Age in north-central Mongolia can be described as broadly similar to those of today (Stacy 2008), but with possibly warmer and wetter climate regimes (Prouse 2005). This is interesting and pertinent for analogical purposes because a) this region is today one of the most populated of Mongolia, and b) the research area continues to be inhabited by mobile pastoralists whose seasonal movements are determined in large part by the needs of their herds of sheep, goat, cattle and horses. And although unique social and political pressures can also affect patterns of movement and social interaction, this similarity in environmental context makes the ethnographic and ethnohistorical analogical comparisons of settlement systems, mobility patterns and environmental exploitation presented in this study more suitable (Binford 1968; Hole 1979; Wylie 1985). Therefore, the possibility of (some) continuity linking ancient and modern populations in this region has been deemed useful for analogical purposes in this study as it can help to define, support and direct the parameters of inquiry.

1.6.2 Ethnographic and Ethnohistoric Context of the Research Region

Currently, approximately 350 families (with an average of 4 persons per household), of which most are organized into small herding groups, inhabit the valley's broadly defined research area (i.e. within the *Khanuy Brigade*'s administrative unit). Average seasonal camp size varies between two and four families during the winter and between three to five families during the summer. These numbers are also consistent with Pre-Soviet Era ethnohistorically recorded census information gathered in the neighboring regions of Tuva, Kazakhstan and Western Mongolia in the early 1800s and early 1900s (see examples in Vainshtein 1980:98-99). These economically self-sufficient herding units (most often consisting of extended families) are in a very real sense the primary communities of mobile herders in the Khanuy Valley. These herding units make relatively short-distance seasonal movements in order to maintain herds of sheep, goats, cattle, and horses. Indeed, ethnographic research by Simukov (1934), Bazargur (2005), Erdenebaatar (2000) and this author on mobility patterns in the Khangai range of central Mongolia have recorded patterns of relatively localized seasonal migratory circuits that reflect a region of constant and high productivity (Figure 1.10). In fact, the Russian ethnographer Simukov, who carried out research in the 1930's on mobility patterns in Mongolia, identified a system of movement, which he called 'Khangai', in the region of which the Khanuy valley is a part. He pointed out that owing to the constant and high productivity of the region, including the presence of different complementary types of pasture within a short distance, there was no need to make long migrations in response to drought (Simukov 1934). He estimated the diameter of the annual movement cycle in this region to be no more than 7-8 km, a pattern still prevalent today (on this mobility pattern also see Novgorodova 1989; Vainshtein 1980). Interestingly, according to information provided by the local administrator at the Khanuy *brigade* (or *bag*—the

smallest Mongolian administrative unit), the human and animal population presently doubles in the valley during the winter period due to incoming herders from less productive and less well sheltered neighboring regions, bringing the total animal population to the astonishing number of about 40,000 to 60,000 head of livestock within about a 300 km^2 area (Houle 2004, n.d.). This is probably a bit of an exaggeration, but it does suggest a substantial increase in population during the winter, especially in terms of livestock. Although interviewed local herders agree that this is too much for the at least perceived carrying capacity of the valley, together with the environmental data presented above it does highlight the fact that the Khanuy Valley is a particularly favored environmental region.

Seasonal mobility in the Khanuy Valley is currently based on a two to four season system. Campsites in the valley that are the most distinctive spatially are those of summer and winter, while spring campsites are usually located between these two, often closer to winter campsites (Figure 1.10). Spring campsites are usually only set up if and when winter campsites are excessively soiled by too much animal excrement, for example, and to access new vegetation. Winter camps tend to be located in valley draws along the foothills, while summer camps tend to be located along the Khanuy River (some 4 to 5 km from the foothills) or its floodplain when the terrain is not suitable and/or when other sources of water are available, such as lakes or other streams. According to the valley's herders, a good winter site is a location that is protected from the cold wind, has areas of exposure for grasses during winter, and is relatively close to a water hole or a spring. The main characteristics for a good summer campsite are flat terrain with good grazing, and proximity to a large water source (i.e. a river or a lake). This patterning is very similar to the one recorded in 2000 by Diimaajav Erdenebaatar for the Egiin Gol Valley in northern Mongolia (Erdenebaatar 2000), and, once again, largely corresponds to

the 'Khangai' pattern identified by Simukov as early as the 1930s. Given the similar herding patterns between those recorded by early ethnographers and those observed today, the current household organization of herding in the valley probably represents a time-tested and efficient way to utilize local resources relative to herd animal exploitation. And as Koryakova and Hanks have recently reiterated: "The degree of mobility, herd composition, and amplitude and distance of migration obviously depend on local environmental conditions, social and economic levels of development, and the traditions of any given society" (Koryakova and Hanks 2006:278), a point underscored a while ago for Mongolia by Lattimore who noted that "it is not that Mongolian nomads *do* move, but that they *can* move" (1962:61-62), and how often they move and to what extent depends on local circumstances, herd composition, and local environmental conditions (Bazargur 2002; Lattimore 1962:73; Simukov 1934).

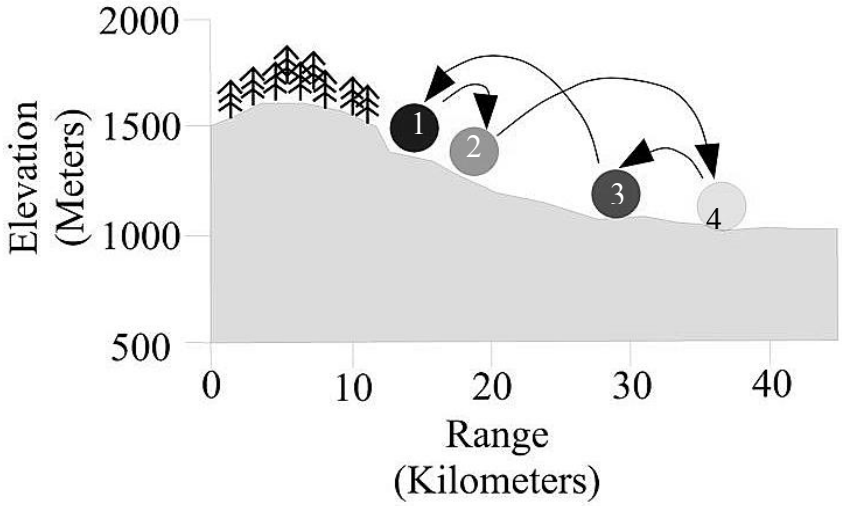

Figure 1.10 Present-day seasonal mobility in north-central Mongolia
(campsites: 1, winter; 2, spring; 3, fall; 4, summer).

Theoretically, therefore, and of pertinence to this present study, this type of micro-regional mobility pattern, if also present in the past, can have profound implications in terms of territoriality and the nature of a given pastoral economy (Barth 1961; Cribb 1991; Irons 1974; Koster 1977; Meadow 1992; Rosen 1992; Spooner 1973; Tapper 1979). It also has important implications for issues of regional demography, resource mobilization, centralization, and the nature of societal complexity (cf. Burnham 1979, Irons 1979 and Salzman 1967). In the Iranian area, for example, there seems to be a correlation between lush and predictable pastures (leading to shorter migration routes), higher population densities, and strong chiefly control (Barth 1961:128; Tapper 1979:97).

1.6.3 The Khanuy Valley's Architectural Landscape

Archaeologically speaking, the Khanuy Valley is dotted with numerous monumental mortuary and ritual sites dating to the period of interest. It is also located at the geographical meeting point of the major forms of Late Bronze Age archaeological monuments (i.e. *khirigsuurs*, 'slope burials', deer stones and slab burials) (Novgorodova 1989:256) (Figure 1.11). In addition, the valley is typical of the fact that although *khirigsuur* complexes cover a fairly large territory, they are mostly concentrated along major river valleys located between the Khangai mountain range in central Mongolia and the regions of Gorno-Altai, Buryatia, and particularly Tuva in southern Siberia (Figure 1.12) (Tseveendorj et al. 1999; Tsybiktarov 2003; Volkov 1981:123), or located in geographical focal points such as 'oases'—for example the *khirigsuurs* found in Baga Gaziryn Chuluu, south-central Mongolia. This may not be a coincidence since there are many lines of evidence that suggest that the Late Bronze Age societies of central Mongolia may have had some type of connection with the contemporary specialized metal producing Karasuk culture of

southern Siberia (Askarov et al. 1992; Gryaznov 1969:98; Volkov 1967, 1995)—including the fact that Mongolia could have been a possible path for the diffusion of Karasuk type bronze artifacts toward China (Legrand 2004). While this thesis does not propose any particular solution to the conundrum related to deer stones and their connection to social structure, it is worth mentioning that their distribution conforms greatly to the distribution of *khirigsuurs* (Volkov 1981:123), together forming what increasingly seems to be closely-related components of a single ceremonial complex (Fitzhugh 2009).

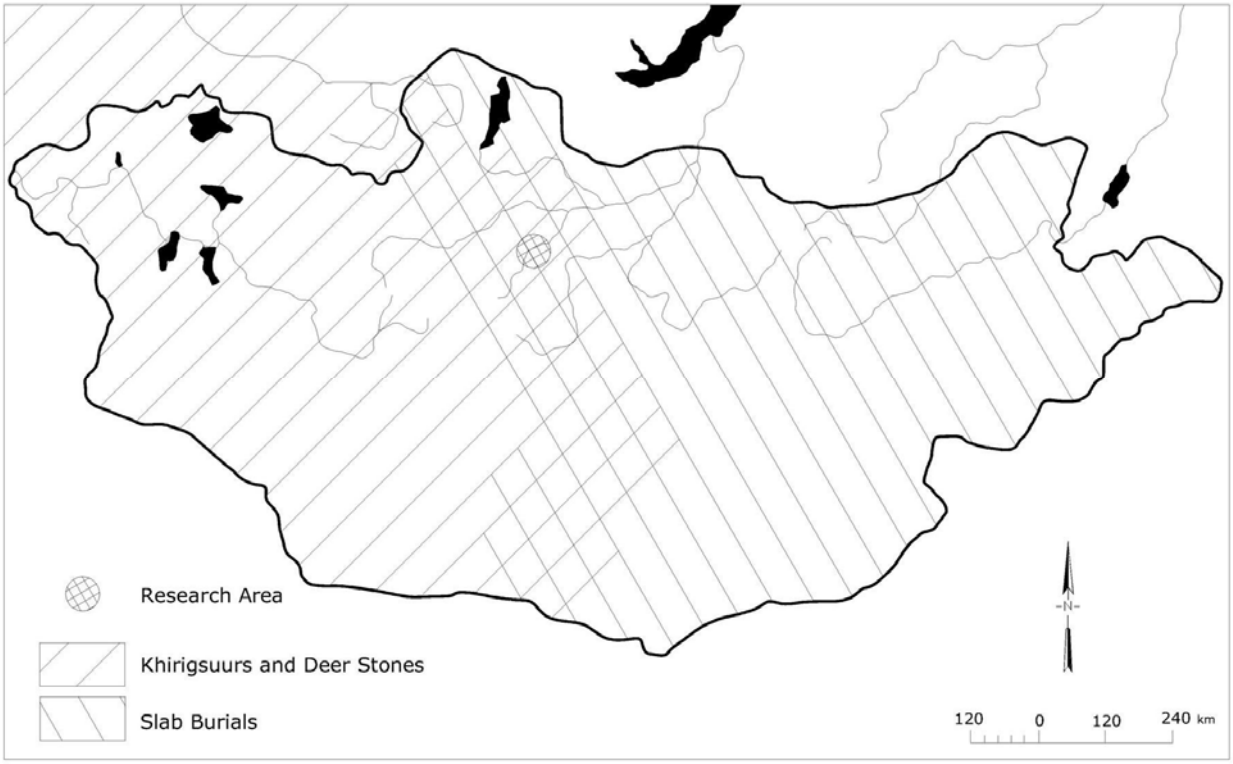

Figure 1.11 Distribution of *khirigsuurs*, deer stones and slab burials (redrawn and modified from Novgorodova 1989).

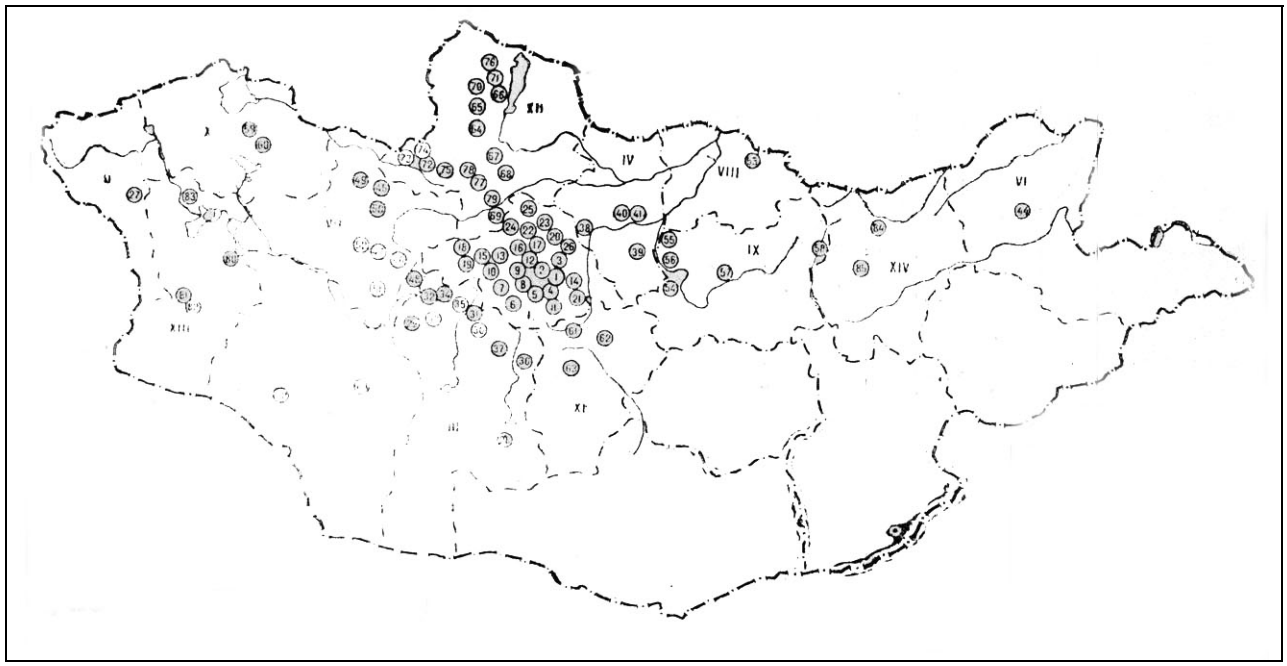

Figure 1.12 Distribution of deer stones in Mongolia, which approximates the distribution of *khirigsuurs* (from Volkov 1981).

On a more local scale of analysis, although *khirigsuurs* are distributed in a somewhat network-like pattern throughout these valleys, there are a number of areas that show particularly high densities of these monumental structures, thus suggesting places of higher centrality. In fact, a roadside survey in the Khanuy Valley region revealed that several large concentrations of these monuments are separated by 'empty', or relatively vacant 'buffer zones', thus emphasizing that these clusters may indeed indicate areas of greater spatial institutionalization of social organization or centrality (Figure 1.13) (see Honeychurch 2004:116-118 for a similar pattern in northern Mongolia). Furthermore, as discussed earlier, *khirigsuurs* are almost always located in conjunction with the less monumental 'slope' burials, forming groupings that may reflect local societal structures (Figure 1.14). These groupings do not usually exceed 10-15 km, which is consistent with ethnographically recorded localized migratory circuits in the region (see above),

and which in turn may have helped to reinforce social and political contacts within a defined territory. Significantly, the scale of many *khirigsuurs*, whose construction must have involved the organized activities of entire communities, and the elaborate seasonal ceremonial activities carried out at these complexes, including the strong possibility of important feasting activities (Houle et al. 2004), certainly fits the archaeological description of central places, that is, the nexus of a larger web of social interaction. One of the two largest *khirigsuurs* (Urt Bulagyn [KYR1]) in the Khanuy River Valley research area measures over 400 x 400 m with a 5 m tall and 26 m in diameter mound at its center (Figure 1.15). It is estimated that well over half a million stones of granite, some of which weighing over one ton, were used to build this monument (Allard and Erdenebaatar 2005). Based on experiments we conducted which suggest that it takes approximately one hour using a cattle-driven cart to bring a 45 kg stone to the Urt Bulagyn *khirigsuur* from the closest source of granite rock which is located along a fairly steep mountain slope about 1 km away (and we have no evidence they used carts in the Late Bronze Age, although they may have used other contraptions to transport the stones such as sleds similar to the Pazyryk one found in barrow 5 [Rudenko 1970:192]), it is estimated that it took 20, 833 person-days to build this *khirigsuur* alone. Furthermore, while a number of 'satellite' features containing animal deposits regularly accompany *khirigsuurs* (usually ranging from 12 to 40, and exceptionally as many as 150 [Erdenebaatar 2004]), this *khirigsuur* has over 1700 small mounds, all containing an east-facing horse skull and/or vertebrae or leg bones, and over 1000 stone circles containing cremated animal bone fragments of various animal species (Allard and Erdenebaatar 2005)—all of which indicates a huge access to and/or a huge supply of probably valuable animals. Research on some of these satellite features indicate that these structures, at least the main ritual features, were probably built during the late fall period (Sandra Olsen,

personal communication), thus suggesting a short yearly construction period. In addition, although these monuments may have been reused over time (Wright 2006), the overall and apparently planned structured organization of these monuments, in addition to overlapping dates obtained from inner and outer satellite mounds at this *khirigsuur* (i.e. BP 2970-2780 and BP 2980-2770) (Fitzhugh 2009) suggest a probable relatively brief overall building period. With this in mind, it then becomes apparent that the number of deposited animal remains as well as the labor involved in the construction of the *khirigsuur* Urt Bulagyn, like many others in the research area, clearly suggests the participation of numerous settlement units, as its construction far exceeds the realistic contribution of an isolated social unit. The widespread regularity of ritual practice witnessed at all levels and space within and between these structures (Allard and Erdenebaatar 2005; Wright 2006, 2007), as well as the practice of depositing particular horse remains in a specific pattern for a period of over 500 years, has suggested to some studying similar patterns for the contemporary metal-producing Karasuk culture (13th - 8th centuries BCE) in southern Siberia that this could only develop in stock-rearing groups with a stable economic structure, who were relatively prosperous, and who had advanced far beyond the relatively egalitarian groups that preceded them in terms of social development (Gryaznov 1969:129; Legrand 2006).

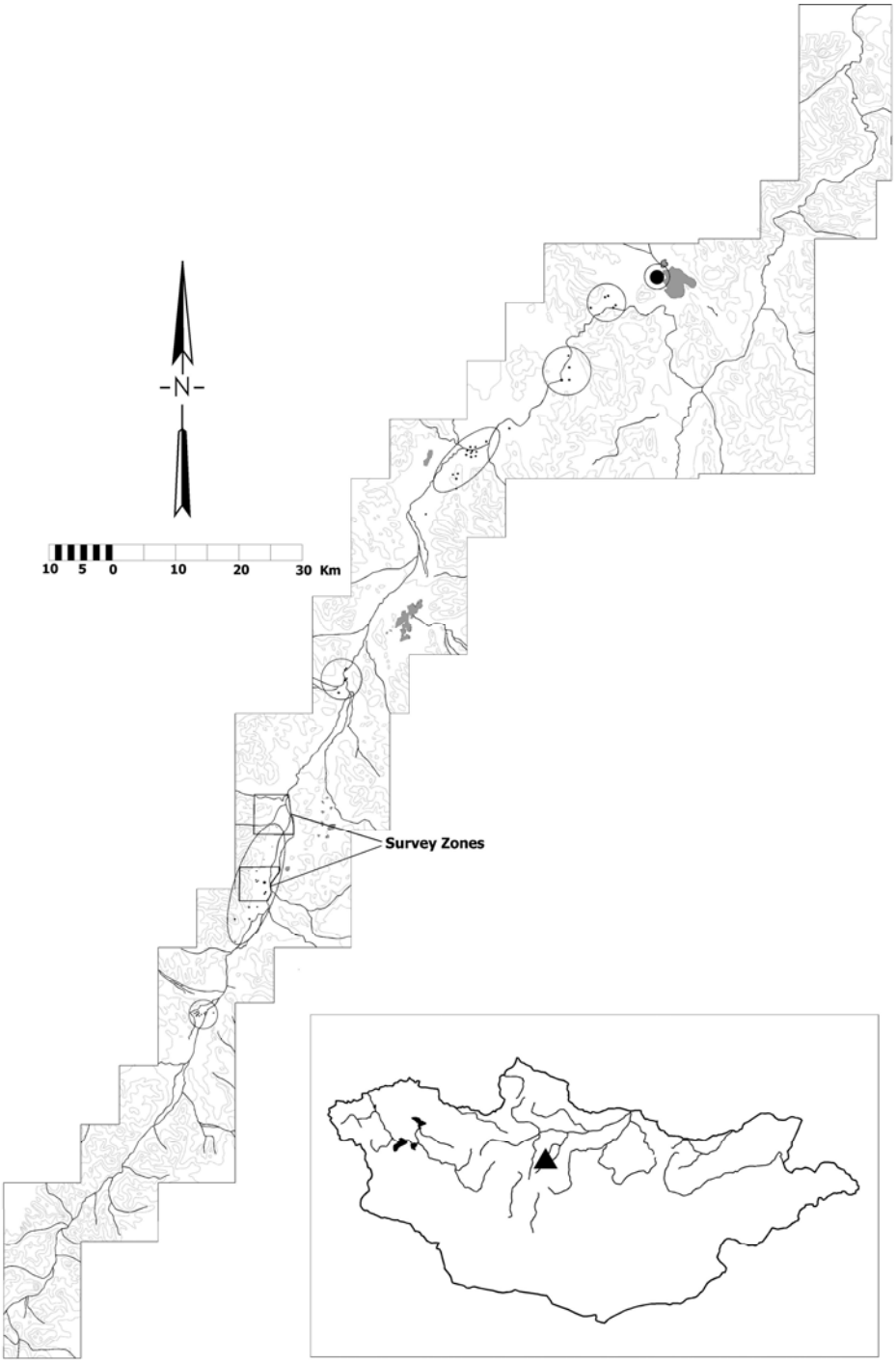

Figure 1.13 Khanuy River Valley showing *khirigsuur* clusters and "buffer zones" (sites not to scale and not all represented in cluster areas).

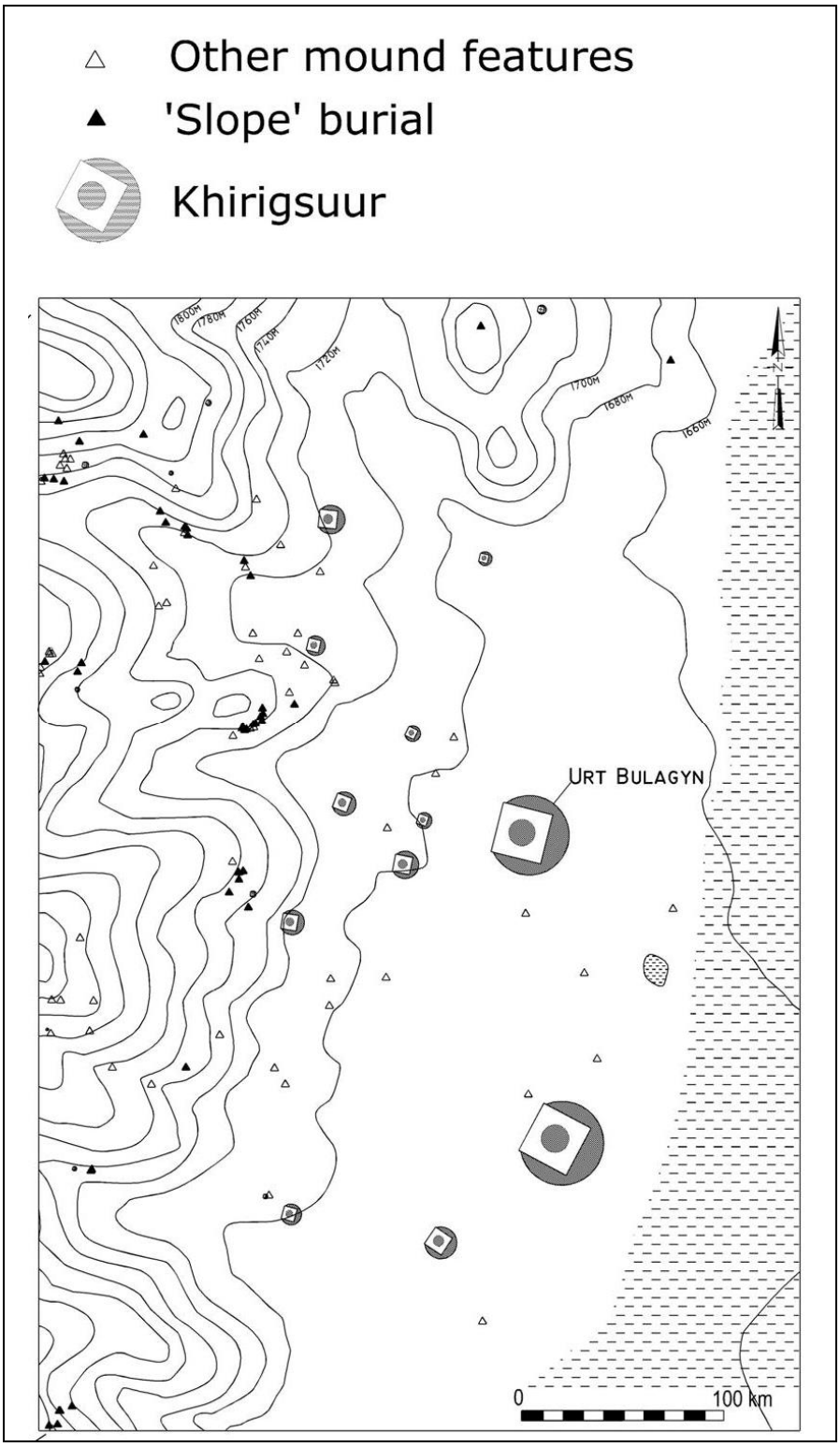

Figure 1.14 Spatial relationship between *khirigsuurs* and 'slope' burials.

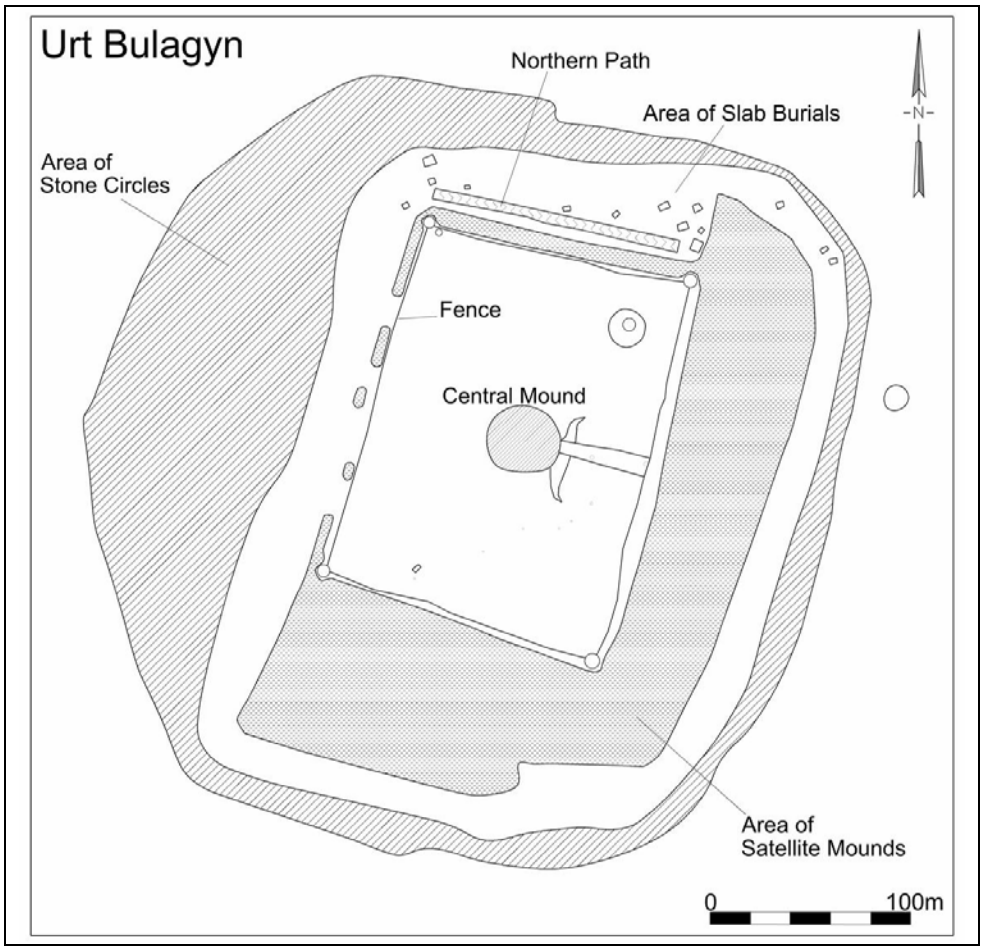

Figure 1.15 Urt Bulagyn *khirigsuur* (from Allard and Erdenebaatar 2005).

Impressive as Late Bronze Age ritual and mortuary structures are, however, studying them without studying the general context of the society that produced them has resulted, as we have seen, in conflicting speculations regarding the nature of Late Bronze Age economic and social organizations. The following chapters provide information on the *social context* of these monumental structures so as to offer a more comprehensive picture of the nature of the economic and social organization of Late Bronze Age societies of central Mongolia—all of which is necessary in order to empirically evaluate the dependency hypothesis of sociopolitical development amongst mobile pastoralists.

2.0 METHODOLOGY

The field strategy pursued for reconstructing the ancient living patterns in the Khanuy River Valley (i.e. the *social context* of the monumental landscape) was regional archaeological survey—the broadest archaeological method for reconstructing patterns of organization at different analytical levels (Billman and Feinman 1999; Chang 1968; Trigger 1967). The use of systematic survey is a relatively recent phenomenon in Mongolia. While burial and ritual structures have been and continue to be fairly well documented, the locations of settlements, specifically Bronze Age settlements, remain relatively unknown. For mobile pastoralists in particular, settlement archaeology may still be one of the areas that has been the most overlooked by regional archaeology research (Cribb 1991:155; but see Chang and Tourtelotte 2002; Frachetti 2004; Honeychurch 2004, for mobile pastoralists of the Eurasian Steppes; and also see Sadr 1988 for Africa). This is unfortunate—and probably has much to do with the assumed 'invisibility' or ephemeral nature of the archaeological remains left by mobile peoples—as settlement sites are where one might expect to find more empirical data for dealing with such issues as demography, subsistence, mobility, and political economy. This research seeks to further fill this gap in Mongolia.

Before going further, however, I feel the need to clarify the terminology used in this study to describe habitation sites. That is, the term 'settlement' used above should be taken here to refer to a place of habitation, without any implication of fixed space or permanence in

occupation. Nevertheless, and given the historical context of the research area, a term such as 'occupation area' might be a more precise label for the archaeological evidence left by the habitations of mobile peoples who often reoccupy locales repeatedly/seasonally over long periods of time, but shift settlement slightly each season, thus leaving a palimpsest of living areas. 'Occupation area', therefore, is used in this text to characterize more precisely the archaeological evidence of settlement sites discussed in this research.

2.1 SURVEYING THE 'INVISIBLE CULTURE': DEALING WITH THE VISIBILITY AND SCALE OF OCCUPATION AREAS

A major challenge for the settlement archaeology of sparse, mobile populations is that habitation remains may be extremely ephemeral and the areas that must be studied are very large. Intensive methods are needed for studying (or even locating) such ephemeral habitation remains, but extensive methods are required to determine the numbers and densities of sites and their distributions with regard to environmental and other variables. The solution to this difficulty is a multi-stage strategy that combines both extensive and intensive methods.

In the Khanuy Valley, as well as in the surrounding region, no above-ground structures related to habitation sites are visible. In addition, the unplowed grassland nature of the research area and concomitant low surface visibility prevented in most cases the surface collection of artifacts. Consequently, shovel probes were used as the primary data recovering method in the current regional survey (cf. Lightfoot 1989). Shovel probes consisted of 50 x 50 cm units that were excavated until the sterile layer was reached (usually no more than about 20-30 cm below the surface), and the soil removed from the probes was systematically screened through 6 mm wire mesh.

Little to no information regarding the size and structure of ancient settlements was previously known. Therefore, in order to maximize the potential for recovering multiple clusters and in order to increase the chances of recording the plausibility of small-size occupation areas (a characteristic often associated with mobile peoples [e.g. Rosen 1992]), a high resolution systematic survey methodology was implemented. This consisted of a crew of 8-10 fieldworkers in addition to the team leader (this author) who walked contiguous transects systematically back and forth across the landscape maintaining 20 m intervals between members and digging shovel probes every 30 m. This fairly narrow survey interval was chosen as it approximates the size of the smallest present-day campsites in the region. A similar methodology proved to be successful in a recent archaeological survey project in Liangcheng, Inner Mongolia (Indrisano 2006:30). It also proved highly successful here as a number of occupation areas of various sizes, as well as siteless areas were discovered (see results in Chapter 3). It was fortunate that this 20 x 30 m interval also corresponds to approximately one second in each longitude and latitude direction, which, with the help of a handheld GPS unit, allowed for an easy way to follow survey tracks in the open steppe environment. Survey flags were thus placed at each second of latitude and longitude by the survey leader to indicate the locations of shovel probes to be excavated. This shovel probing approach was successful and proved necessary as over 99% of the sites were discovered this way—sites that would have been completely missed otherwise. This is important as together with the kurgan-like monumental landscape, the apparent invisibility of settlements in this region (as is the case in many other regions) has usually been interpreted as necessarily reflecting large-scale (extensive) nomadic pastoralism, an assumption that is being increasingly refuted or nuanced in many other areas of the Eurasian steppes where researchers are empirically

investigating the mobility and occupational patterns of ancient pastoralist populations (e.g. Frachetti 2004, 2008).

2.1.1 Recording Scheme and Site Definition

The survey leader was in charge of the field maps so as to locate and monitor transects and the location of sampling units as the survey progressed. Although the focus of this study is the Late Bronze Age, all artifacts including those from other time periods were collected and bagged with a label containing location information. During the course of the survey, all artifacts were identified and assigned a survey area number (e.g. KSP07-A, T1)[2], their location by GPS in UTM (as well as in longitude and latitude), their approximate depth, and a brief description. At the end of the day, artifacts were catalogued and the information concerning the location of artifacts transferred onto the field map in order to observe artifact clusters and patterns.

No minimal site definition was initially established for this survey since the survey was primarily designed to record general and specific density clusters of artifacts and 'siteless' areas. Therefore, all shovel probes with any amount, however small, of ceramics, lithic artifacts, metal objects, etc. and/or faunal remains, as long as they had clear traces of cultural activity (burning, cutting, etc.) and found in context with diagnostic ceramics, were recorded. These individual shovel probes (and associated artifacts) were designated as the basic units of analysis. 'Sites' (occupation areas) were then defined in relative terms, that is, as density peaks against a background of either negative shovel probes or sparsely distributed positive ones spread across the landscape (see Figure 3.2 in Chapter 3). Topography, of course, was taken into consideration when determining clusters. Therefore, the term 'site' (occupation area) here refers to a spatially

[2] 'KSP07-A, T1' corresponds to KhanuySettlementPattern2007-zoneA, Tract1

definable area of past human activity characterized by high (or relatively high) artifact density relative to the background material distribution.

2.2 A NOTE ON CHRONOLOGY

There is as yet no well developed chronology for pre- and protohistoric occupation in Mongolia. For now, only broad sequences (i.e. Late Paleolithic, Bronze Age, Iron Age, etc.) based on diagnostic ceramics associated with a small number of dated burials are available. Consequently, occupation areas here have been chronologized by diagnostic ceramics similar to those found in burials of known period in our research area and from documented ones in the surrounding region (Allard 2004, n.d.; Davydova 1968, 1995; Erdenebaatar 2002; Honeychurch 2004; Miniaev 1998; Navaan 1975; Takahama 2003, 2004; Tsybiktarov 1998, 2003; Wright 2006; Wright, n.d.).

For the Bronze Age, diagnostic ceramics are usually low-fired, coarse grained, and 'red' or 'red-brown' in color (i.e. within the Munsell color ranges of R and YR). Forms are few and are typically either beaker-like shaped, bowls or large basins if based on rim diameters (Figure 2.1). While many are plain, they are occasionally decorated with pie-crust appliqué on the upper portion of the body and/or with simple punctuates or incisions (Allard 2004, n.d.; Erdenebaatar 2002; Honeychurch 2004; Takahama 2003, 2004; Tsybiktarov 1998, 2001; Wright 2006). A number of Bronze Age pottery fragments have also shown evidence for the use of either cord-wrapped or thong-wrapped (grooved) paddles, giving the body a textured motif (Takahama 2003, 2004; Wright, n.d.). Based on several recently published radiocarbon dates, these ceramic types are dated to between the 12th and 5th/3rd centuries BCE (Fitzhugh 2009; Tsybiktarov 1998:103).

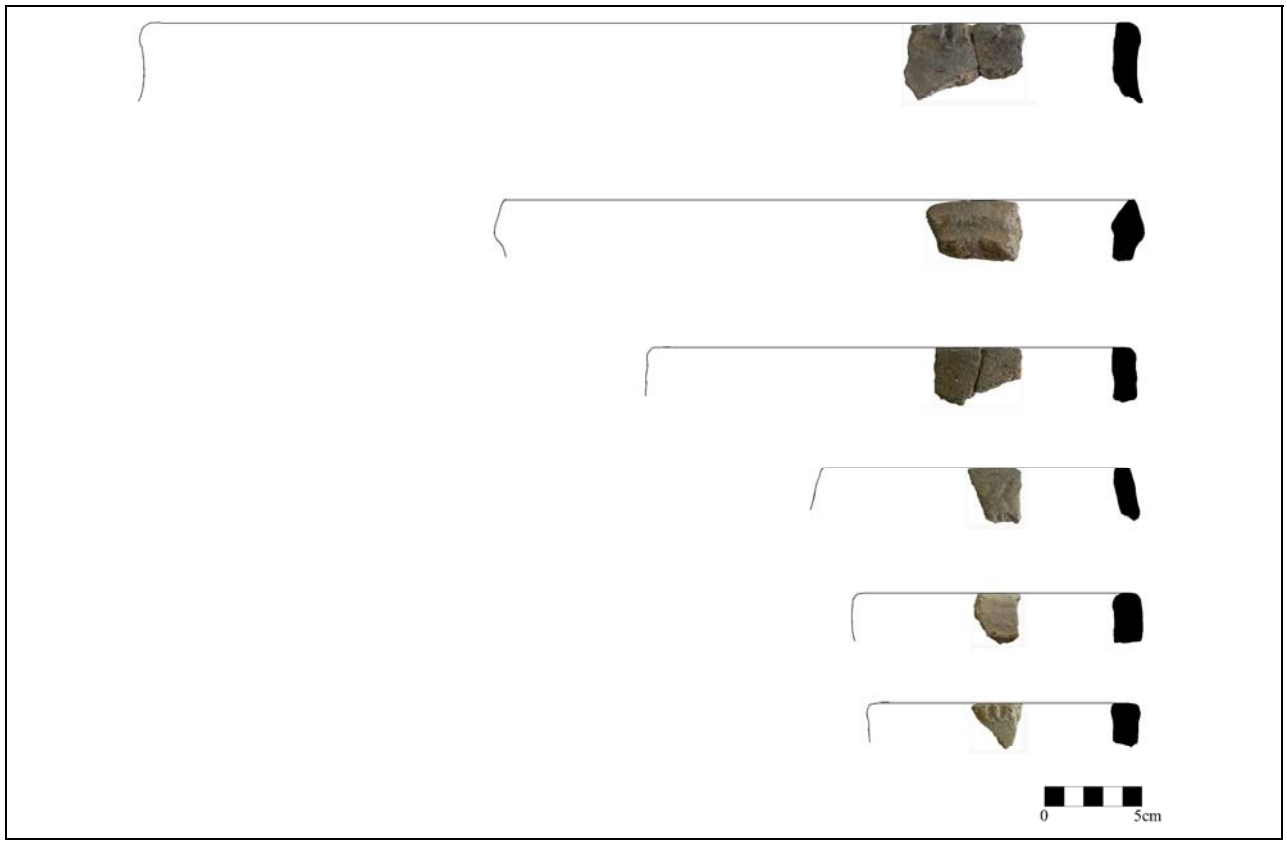

Figure 2.1 Examples of Late Bronze Age ceramics from Khanuy Valley contexts.

The subsequent Iron Age Xiongnu period wares are a bit more varied in size and type/form (e.g. jars, bowls, beakers, steamer forms, etc.) and are typically gray or gray-brown in color, although there are still coarse undecorated red-brown wares. The gray-wares tend to have a much finer paste, are usually hand-built by coiling and often finished on what appears to be a slow wheel, based on surface marks. Surface smoothing is common and ceramics are archetypically decorated with a thong-wrapped paddle, scrape-polished vertical lines and/or incised 'wavy' lines (Figure 2.2) (Davydova 1968, 1995; Hall and Minyaev 2002; Minyaev 1998). Based on an extensive series of ^{14}C dates from mortuary and habitation contexts and/or associated historical material such as Han Dynasty coins (Wright, n.d.), these ceramic types are

dated to between the 3rd century BCE and the 2nd century CE (Crubézy et al. 1996; Hall et al. 1999; Honeychurch 2004; Honeychurch and Amartuvshin 2004).

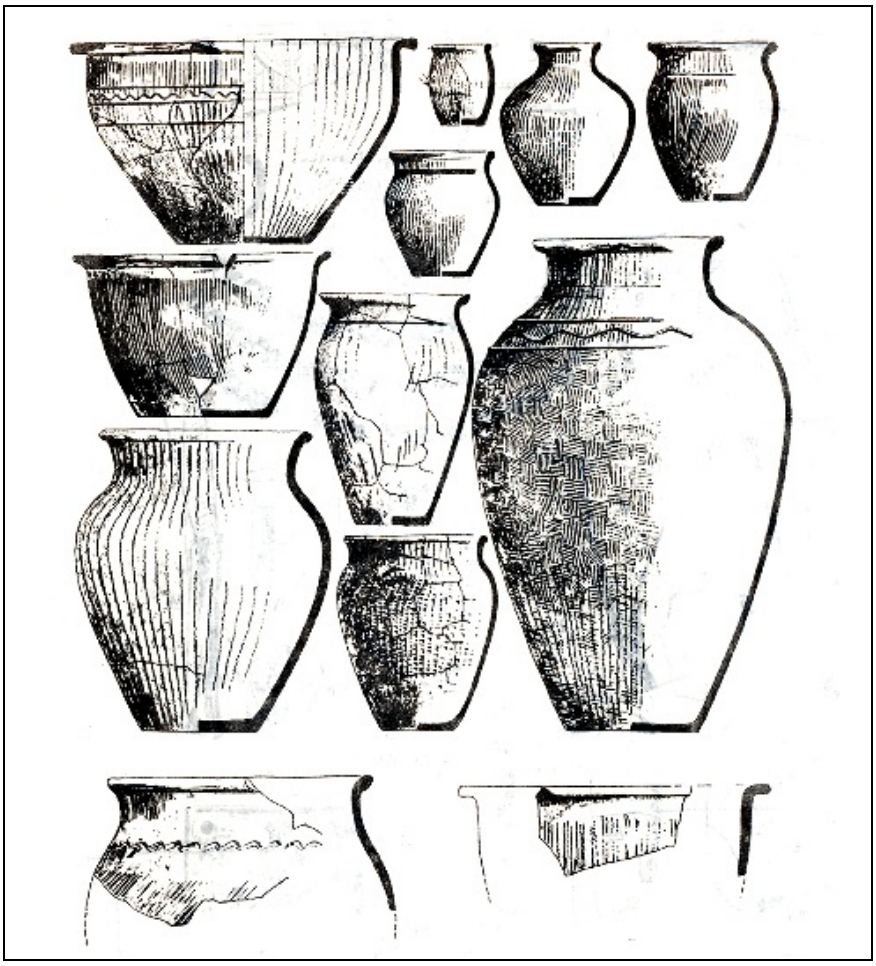

Figure 2.2 Typical Iron Age Xiongnu ceramics from Ivolga (from Davydova 1968).

Certainly, this lack of precise chronological control only allows for broad periodization. However, especially where chronology was particularly important for answering the research questions, care was taken to analyze artifacts and ecofacts—especially faunal remains—that were found in fairly secure single phase contexts. For example, lithic material and animal bones were considered as belonging to the Bronze Age as long as they were associated with Bronze

Age ceramics only. Undoubtedly, this lack in chronological preciseness is an important problem that needs to be further addressed, possibly through soil micromorphology analysis and certainly through more context-specific excavations and dating (the latter being one of the most important lacunae right now). Nevertheless, more and better information will always need to be collected and analyzed, and in accordance with Drennan et al. (1991:315): "It would be a mistake to defer all consideration of the social, political, and economic implications [of the results of the present study] until such time as the chronology has 'sufficient' precision for such purposes" since, for one, this present work will actually help provide the more precise habitation contexts for such future studies. Furthermore, despite the inevitable probability of palimpsests of occupations during the Late Bronze Age (especially in dealing with mobile peoples), I am fairly confident that because we are dealing specifically with a single period of time and since, in a sense, it is the better understanding of the *overall* socioeconomic and sociopolitical picture that predated the Iron Age Xiongnu period that is of interest in the present study, then these issues should not worry the reader excessively since the overall objectives set out in Chapter 1 and reiterated above should still be met. This is not to say that a more detailed understanding of the Late Bronze Age period based on more secure dates, sequences and contexts would not be preferable and maybe more accurate, especially in terms of describing ancient pastoral systems that may have been highly variable from one year to another. However, since it can be assumed that these same biases apply equally to all occupation areas (e.g. palimpsests of campsites; variability in yearly mobility, as well as in herd composition and structure from one year to another, etc.), then this should not hinder useful comparisons between one survey area to another within the same period and within the same research zone. In the end, an overall understanding of the nature of

the social and economic organization of Late Bronze Age groups inhabiting this region of Mongolia should still be acquired.

2.3 ENVIRONMENTAL ZONES AND LAND USE PATTERNS: STRATIFYING THE LANDSCAPE

In order to better understand the socioeconomic and sociopolitical organization of human populations, especially for mobile peoples, it is necessary to capture the fullest range of human activity over a multitude of exploitable environments. The theoretical underpinning of this, as it is widely recognized and applied in modern survey archaeology (e.g. Chang 1992; Frachetti 2004; Indrisano 2006; Schiffer et al. 1978), is to have a meaningful sample of a variety of environmental zones and landscape settings.

The study area was thus stratified according to general environmental criteria. This process involved the classification of the study area by features of topography or terrain (e.g. floodplain, foothills, etc.) as hypothetical correlates of distinct 'environmental' zones (cf. Chang 1992; Frachetti 2004). These classifications were generated through the observation of modern land use, as well as from aerial photographs and topographic maps. The result was a research area that was divided into four distinct zones, or tracts, in which landscapes of unknown, but presumably relatively high, site potential were explored (Figure 2.3): Tract 1 (T1) consisted in the contemporary summer (and sometimes fall) campsite area which is located within 200 m of the Khanuy River; Tract 2 (T2) consisted in the contemporary winter (and spring) campsite area located in valley draws along the western foothills—some 4-5 km from the present-day summer campsites; Tract 3 (T3) consisted in the area between the foothills and the floodplain (where most *khirigsuurs* are located); and Tract 4 (T4) consisted in the Khanuy River floodplain itself.

Each of these tracts, which normally exhibited relative uniformity of vegetation, visibility, and modern land use, was defined as a parcel of land of varying size, the parameters of which were determined by natural features, such as topographic contours, rivers, etc., as well as by what could be covered given time and resource constraints. Tracts were normally of rectilinear shape, but features of terrain and topography (especially along the river and the foothills) sometimes imposed unusual outlines. Specifically, abrupt cliffs, very steep slopes, and ravines, which have never produced evidence of occupation in past survey, were not surveyed. These areas were nonetheless systematically surveyed during the prior survey of monuments in the research area (Allard 2004, n.d.).

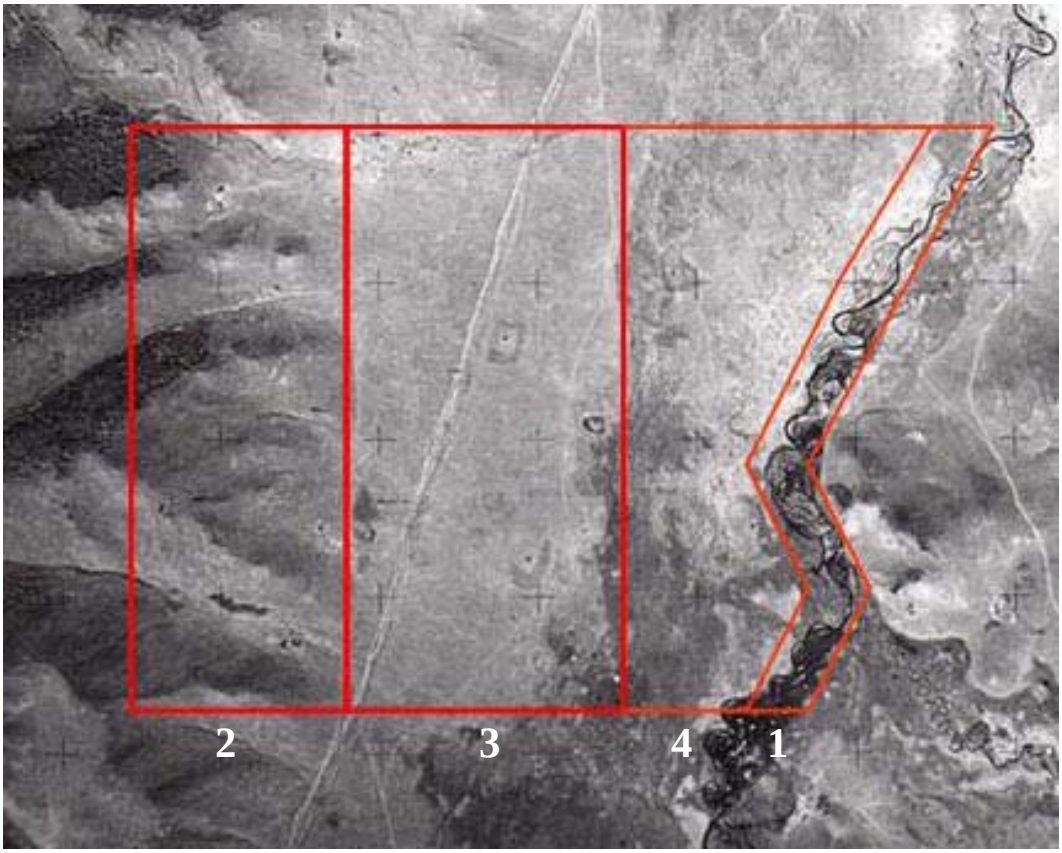

Figure 2.3 Stratified survey tracks in the research area (example from Zone A).

2.4 SAMPLING THE LANDSCAPE: GETTING MORE FROM LESS

Tracts 1 and 2 are for many practical reasons preferable zones of occupation and, not surprisingly, are occupied today. As discussed in the ethnographic section in Chapter 1, the characteristics of tract 1 fulfill the requirements of what contemporary herders consider to be a good summer campsite location, while tract 2 fulfils those of a good winter campsite location. Both these zones were thus systematically surveyed using the high resolution intensive shovel probing methodology described above. However, a large expanse of territory located between the foothills and the Khanuy River floodplain (i.e. Tract 3 – the area where most *khirigsuurs* are located), in addition to the floodplain area itself (Tract 4), are presently not occupied. This may well have been the case during the Bronze Age as well. However, in order to avoid any self-fulfilling prophecies regarding the location of occupations and past patterns of land use, these zones were systematically sampled. Based on previous systematic exploratory high-resolution survey work done in 2004 by this author, less than 1.5% of the area corresponding to Track 3 showed evidence of occupation (i.e. positive shovel probes), regardless of the period, whereas in valley draws (corresponding to Track 2 and where winter camps are located today), for example, over 5% of the area showed evidence of occupation (regardless of period), thus suggesting that the area between the foothills and the river were not settled in any substantial way during the Late Bronze Age. A sample of 188 shovel probes was excavated in each of these two zones (Tracks 3 and 4) — for a total of 376 shovel probes. Samples of this size made it possible to estimate the proportion of each of these zones showing evidence of occupation for the Late Bronze Age, with error ranges no wider than ±2% at the 95% confidence level (Drennan 1996:142-144). The results of this sampling procedure did indeed confirm a very low, even negligible intensity of occupation for both these zones, as the proportion of occupied territory in

tract 3 (the area where most *khirigsuurs* are located) suggests that less than 0.5% of this area was occupied during the Late Bronze Age, while there were no traces of occupation in the floodplain area itself.

Nevertheless, additional shovel probes (n = ca. 500 per monument) were excavated in the areas within 200 m around the two largest *khirigsuurs* [KYR1 and KYR40] in order to attain the same resolution employed for the two zones of complete survey (i.e. 20 x 30 m interval) and so as to better characterize the area immediately surrounding these monumental structures. These additional shovel probes did indicate some evidence of activity, although negligible, east and northeast of both these structures, with three positive probes (or about 0.6%) around KYR1 (Urt Bulagyn), and four positive probes (or about 0.8%) around KYR40, the largest *khirigsuur* in the valley. Negative additional radial probes around these few positive ones confirmed that these places were not occupation areas. Consequently, in order to keep the sampling procedure free from bias for statistical analysis, only the shovel probes (and recovered artifacts) excavated during the initial sampling strategy were used to estimate proportions of occupied area in this part of the valley. Counting the two ca. 20 km^2 zones together (see below), this total survey of all tracts involved some 7700 shovel probes.

2.5 EVALUATING CENTRALITY: ZONING THE LANDSCAPE

One of the important objectives of this research was to better understand the ancient sociopolitical structure of these Late Bronze Age societies. Therefore it was necessary to account for the possibility of 'centralization' and the potential pull effect of the monumental structures on human communities. In order to accomplish this, two ca. 20 km^2 zones that had distinctively

different densities of monumental sites were surveyed, the first (Zone A) encompassing a particularly large concentration of *khirigsuurs* and other Late Bronze Age monuments, and the second (Zone B) encompassing both the tail end of one such *khirigsuur* site cluster, as well as part of an area that comprises no visible monumental structures, that is, a "buffer zone" (Figures 1.13 and 2.4). This allowed for an evaluation of monument/settlement spatial relationships. The idea behind this strategy was that if we were to find that intensity of occupation was high near the center of the *khirigsuur* cluster, and diminished farther from it, reaching a low point in the survey area between *khirigsuur* clusters, then this "buffer zone" of lightly occupied territory would provide us with a way to delimit a sociopolitical unit focused on a major *khirigsuur* or *khirigsuur* cluster and to discuss its spatial and demographic scale. Conversely, if there were to be no evidence of such demographic centralization coinciding with a *khirigsuur* cluster, it would then suggest to us that monuments did not play such a role in creating bounded territorial human communities in the regions immediately surrounding them and therefore that political organization was more decentralized. This methodological approach also allowed us to evaluate whether *khirigsuurs* could have alternatively been used as boundary markers of territories such as is apparently the case, for example, during the European Migration Period (AD 400-800) where elite mounded burials are often found on the edges of emergent polities (Parker Pearson 1999:135). This was not the case with *khirigsuurs* in Late Bronze Age Mongolia.

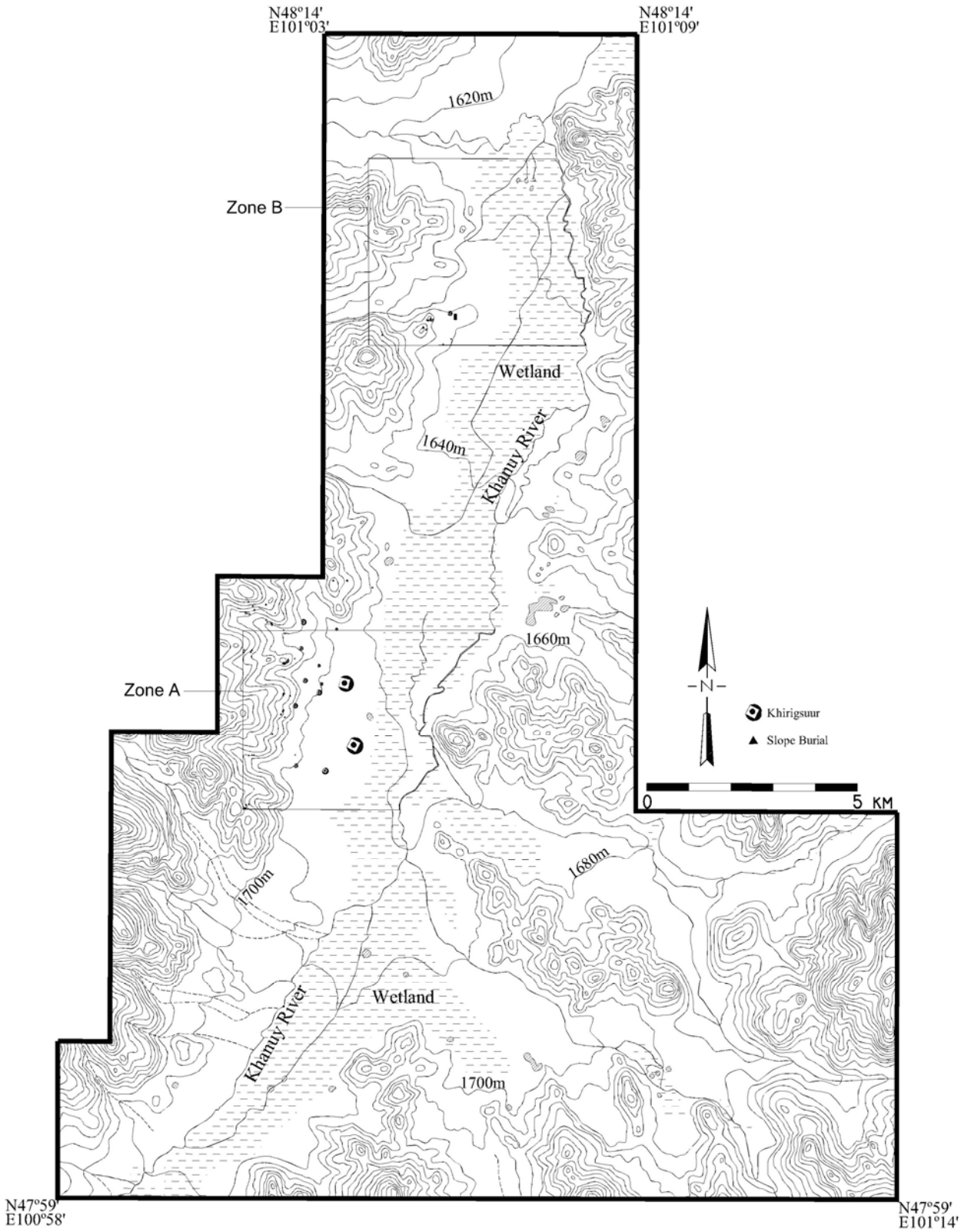

Figure 2.4 Zones A and B within the Khanuy Valley research area.

3.0 SETTLEMENT AND DEMOGRAPHIC PATTERNS IN THE LATE BRONZE AGE

Information regarding the distribution of Late Bronze Age populations in Mongolia has been until now essentially limited to what could be extrapolated from the locations of monumental sites and burials (but see Honeychurch 2004:114; Wright 2006). And because no above-ground structures related to habitation sites are visible, these populations have essentially been described as large-scale (extensive) nomadic pastoralists who occupied areas only ephemerally (but see Wright 2006). This chapter attempts to fill this gap by providing a sub-regional and local analysis of settlement patterns so as to be able to empirically discuss the distribution of habitation areas, evaluate the possibility of centralization and settlement differentiation, and propose population estimates—all necessary elements for better understanding the scale and nature of the social organization of these populations, and all crucial to evaluating some of the assumptions that underlie the dependency hypothesis.

3.1 THE DISTRIBUTION AND ORGANIZATION OF OCCUPATION AREAS IN ZONE A

Zone A represents the core area of an important cluster of Late Bronze Age burials and ritual/funerary structures, including the two largest *khirigsuurs* presently known. In all, 20 *khirigsuurs* of various sizes, a few deer stones and at least 43 'slope' burials characterize this zone—together highlighting the central nature of this area.

The distribution of occupation areas in Zone A during the Late Bronze Age suggests a fairly sparse, but evenly distributed population, the type that might be expected of mobile pastoralist groups (Figure 3.1). Fourteen sites (as defined in the previous chapter) characterize this occupation (these yielded a total of 217 sherds from 56 positive shovel probes). Although this occupation is fairly scant in terms of the overall survey area, the settlements occupy every valley draw along the western foothills and are distributed at fairly even narrow intervals along the Khanuy River—all with uninhabited boundary areas and sufficient pastoral resources between them. These latter sites are also located on slightly higher flatter terrain within the uneven and sometimes marshy floodplain, a settlement pattern still prevalent today. It is worth mentioning here that some of the Late Bronze Age occupation areas along the river were identified during the survey by a single shovel probe which often contained a single Late Bronze Age sherd. Nevertheless, in addition to the modern-day use of this area, the identification of subsequent-period sherds within these same locales did attract our attention to these places as probable occupation areas. This was later confirmed through radial shovel probes and test excavations. Certainly, some Late Bronze Age evidence might have been missed during the shovel-probing survey, but the subsequent excavations did confirm the small-size nature of these occupation areas (smaller than one hectare) which may be the result of a less dense and/or a shorter-lived occupation. This will be further discussed below, but by way of comparison even today there are fewer structures (especially animal pens) at these summer campsite locations along the river which are also occupied for much shorter periods of time compared to winter campsite locations along the foothills. In fact, today, households usually spend about twice the amount of time at winter campsite areas (i.e. about 8 months) than they do at summer campsite areas. In any case, the importance of these small sites for understanding the settlement system, as

will be discussed below, underscores the importance of choosing an appropriate survey resolution and of considering single collections as sometimes relevant, especially when dealing with mobile peoples.

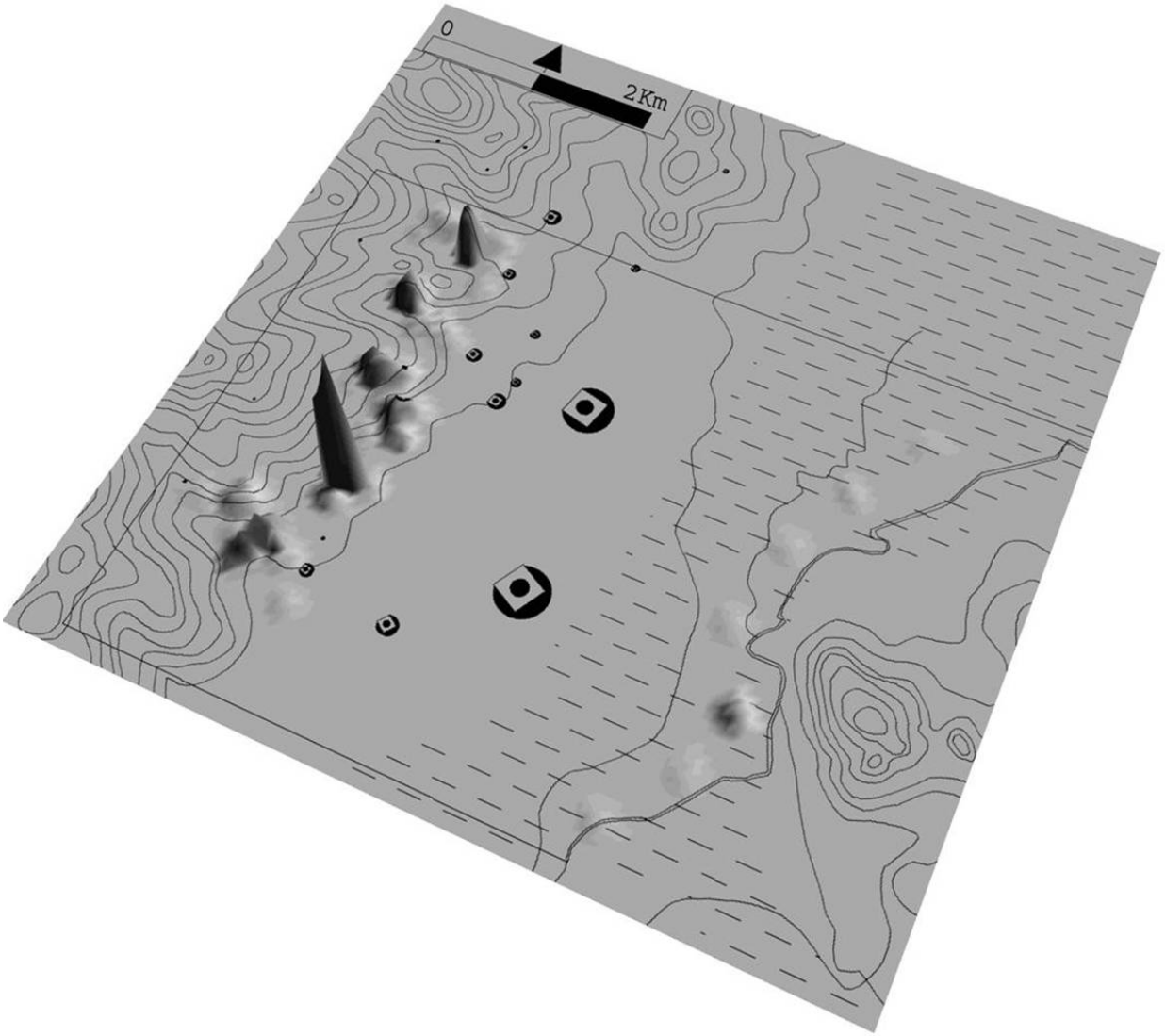

Figure 3.1 Distribution of occupation areas in Zone A
(peaks indicate relative ceramic densities).

Also worth mentioning is the fact that although aerial photographs clearly show scarring of the floodplain landscape due to either the meandering effects of the Khanuy River and/or to the ancient presence of yazoo streams (streams created by excess flow of the main river and which parallel the main channel) (see Figure 2.3), it seams as though the past geomorphological environment (including the location of the main river channel) was probably not that much different from today. To be sure, cultural deposits near the river are found at similar depths as other places in the research area and there were numerous ceramic sherd 'refits' in close proximity at distinct sites found along the Khanuy River, thus suggesting that there hasn't been much post-depositional disturbance. This is to say that the Khanuy River probably did not change its course in any substantial way that would have buried sites under alluvial deposits or destroyed them through the effects of the meandering channel. I am therefore convinced that most if not all of the occupation areas in this survey zone were, in fact, discovered.

What is striking about the Late Bronze Age settlement pattern is that it resembles the contemporary one almost perfectly, that is, with occupation areas in the valley draws along the foothills (the location of present-day winter camps), others along the Khanuy River (the location of present-day summer camps), and no occupation of the area between these two settings (Figure 3.2).

Figure 3.2 Distribution of contemporary campsites and positive shovel probes in Zone A. ⬟ indicate contemporary campsites; 'x' indicate positive shovel probes with Late Bronze Age ceramics.

Moreover, although the contemporary and prehistoric settlement patterns are very similar, the Late Bronze Age landscape may have been inhabited more densely (or more intensely used) than it is the case presently (at least on a temporary basis) since even areas that are presently not occupied, as they are not ideal locations compared to other available settings (e.g. not as well sheltered or further from water sources), revealed evidence of occupation. That is, without any exception, but to different degrees, every valley draw along the foothills has evidence of Late Bronze Age occupation; and nowadays there is no reason, according to local herders, to occupy some of these less favorable locations if other better suited places are available. One such setting is represented by the third peak from the top along the foothills on the left hand side of the map in Figure 3.1. This occupation area (SP26E-MAC), discussed further in Chapters 4, 5 and 6, is located on a fairly high terrace with no access to water and with little shelter from the cold winter winds. According to local herders, nobody has occupied this area in living memory. Nevertheless, based on artifactual evidence this region was apparently never occupied so densely that the unavailability of land would had forced people to settle in the less than favorable area located between the foothills and the Khanuy River, the area where most monumental sites are located.

As will be further discussed below, it is clear that this settlement distribution corresponds to a pattern that takes into account environmental criteria, ones that seem to be linked to seasonal changes. This is not to say that social and political factors were not also important when considering the location of occupation areas (nor that these did not vary yearly), but it is apparent that people settled more densely (or more often) in the most seasonally favorable areas. The area between the foothills and the Khanuy River (zones 3 and 4), while constituting the most abundant fodder resource for animals, is ill suited for habitation either in the winter or in the

summer as it provides neither shelter nor easy access to water. It is thus not surprising that this area has never been occupied either in the present or in the past.

In sum, when the distribution and the relative density of settlement sites, as well as the important number of mortuary and ritual sites are considered together, it becomes clear that the Late Bronze Age groups were actively exploiting this zone for social, ritual, and domestic purposes.

3.1.1 The Characteristics of Occupation Areas in Zone A

Along the foothills, the six or seven identified occupation areas are located within sheltered draws that lay at an average elevation of 1750 m above sea level, although one or two additional artifact concentrations which may indicate smaller or shorter-lived campsites lie just outside of these protected areas (Figure 3.1). For the most part, the only significant aspect distinguishing individual draws is their size. Although the draws themselves are not forested, wooded areas are accessible within walking distance either deep inside the draws or atop the mountains. Today, within these wooded areas, wild animal species such as deer, wolf, fox, wild boar, and hare can be found, as well as a number of wild edible plants and berries. Water in the form of small seasonal streams is also found deep inside some of the draws. A quick look at the topographic map and the location of the occupation areas suggest that the settlement distribution along the foothills has probably much more to do with the specific topography of the hills themselves (and the shelter and resources they provide – cf. Cribb 1991:137-138; Vainshtein 1980:83) than with any kind of social spatial buffering scheme – although these natural barriers can also act as such (Figure 3.1). Consequently, although individual draws, depending on their size, may have housed more than one household (and/or have been reoccupied), distinct occupation areas are easily distinguishable from each other as they are separated by the hill slopes or abrupt cliffs that

separate each draw. In addition to spatially definable artifactual evidence for occupations, therefore, these natural spatial barriers provide further guidelines, as will be discussed below, for evaluating upper and lower limits of population densities within each occupation area, the first step toward calculating regional population estimates.

As for the distribution of the 7 occupation areas identified along the Khanuy River, all occupy a very similar locale. Situated at an average elevation of 1660 m above sea level, most occupations are located within 100 m or so of the river, an area that corresponds to part of its floodplain. No important distinguishable features differentiate the sites from one another in terms of setting. All are typically located on a slightly elevated and fairly flat terrain within the floodplain and the only currently visible 'barrier' between occupations is the more low-lying uneven and wetter areas of the floodplain which are not suitable for setting up a campsite. Beyond this, and as is the case in the ethnographic present, the fairly regular distance between occupation areas suggests that this may be due to some kind of social spatial buffering principle that allots equally sufficient pastoral resources to each campsite while minimizing distances between households, which in turn may have facilitated communication and cooperation between households.

In regard to what the overall settlement system suggests, it is difficult to talk about a 'classical' vertical transhumant mode of mobility as only 3-4 km separate these two zones and only about 100 m of verticality differentiate each zone of occupation. If compared to the ethnographic present, however, these different occupation zones do seem to be linked to different seasonal locales—those of winter and summer respectively. It does also suggest a very restricted mobility pattern, one that may be characterized as fairly horizontal and zonal in this area. Consequently, the recently suggested term *horizontal transhumance* (or *horizontal mobility*)

might better describe the movement suggested by this settlement pattern (Wendrich and Barnard 2008:8). Notwithstanding distances and altitudinal differences, this pattern is also similar to Vainshtein's second type of seasonal migration that involves movement from winter pastures in the mountains to summer pastures on the plain, and back again with the approach of cold weather (1980:93). Seasonality of occupation zones will be further discussed in Chapter 5.

3.2 THE DISTRIBUTION AND ORGANIZATION OF OCCUPATION AREAS IN ZONE B

Zone B corresponds to the tail end of a cluster of Late Bronze Age burials and monumental sites, as well as part of an area that comprises neither burials nor *khirigsuurs*, that is, a "buffer zone".

This zone offers a similar settlement pattern as the one observed in Zone A and findings suggest about 12 occupation areas (these yielded a total of 117 sherds from 47 positive shovel probes) (Figure 3.3). That is, along the western foothills, the pattern of positive shovel probes indicates the use of this area as a preferred settlement location during the Late Bronze Age. However, although the initial survey model—based on what was known from Zone A—was to systematically survey 200 m along the Khanuy River, this needed to be modified in the field due to ethnographic evidence (i.e. the location of contemporary campsites) as well as to logistical problems (i.e. the floodplain was impracticable by vehicle and was often flooded, thus rendering it impossible for surveyors to either walk and much less dig shovel probes in this area). Based on this information and situation, we rather systematically surveyed a 200 m band along the outskirts of the floodplain area. This proved to be a good change of plan as this area did pan out to reflect past settlement locations. And indeed, in Zone B, herders today set up their summer campsite within 200 m outside of the floodplain instead of near the Khanuy River where there is

practically no flat terrain. In addition to the problem of actually getting to the river channel due to the extreme unevenness and often inundated nature of this section of the floodplain area, herders need not get their water from that source as there is a closer and more easily accessible one. Today, in one area, this is a manmade well built during the Soviet Era; but in addition to visible river cuts, topographic maps and forty year old aerial photographs clearly indicate that there were three additional secondary rivers in this area (which are now usually dried up) that fed into the main Khanuy River (Figure 3.3). Older herders confirmed the use of these other sources of water by their parents/grand parents prior to the presence of the well. Regardless, numerous (and continuous) positive shovel probes with artifacts dating to both the Late Bronze Age and the Iron Age periods along this section of the floodplain confirmed that this was indeed the preferred location for settlements in the past also (Figure 3.4). This suggests a similar yet even wetter, and probably richer, environment in the past—all of which is supported by the geochemical and sedimentological evidence, as well as the pollen analysis presented in Chapter 1. No evidence of occupation was discovered between the edge of the floodplain and the hills, suggesting once again that the section of the valley where large monumental structures are usually erected was apparently uninhabited. Interestingly, although the argument cannot be made wholesale for the prehistoric past, some of the present-day herders using the floodplain's edge area for their summer campsite only actually move about one to two kilometers away from their winter campsite location. This seems almost like a useless move, except for the reasons given to me of occupying 'cleaner' areas and moving away from the fly-infested hills during the summer. Although these are exceptions, the overall Late Bronze Age settlement pattern in this zone parallels the one in Zone A, that is, one that suggests a very restricted mobility pattern. It does also underscore the fact that the valley is, and probably was, rich enough all year round that there

would usually be almost no environmental reasons to migrate over great distances (cf. Simukov 1934). This does not necessarily mean that there were not occasional longer circuits or that part of the population (human and animal) did not sometimes move over greater distances, but the overall settlement system does suggest, once again, very limited mobility.

The striking characteristic of this settlement pattern, once again, is that it mirrors the contemporary one almost perfectly, that is, with occupation areas in the valley draws along the foothills (the location of present-day winter camps), others along the Khanuy River floodplain (the location of present-day summer camps), and no occupation of the area between these two settings.

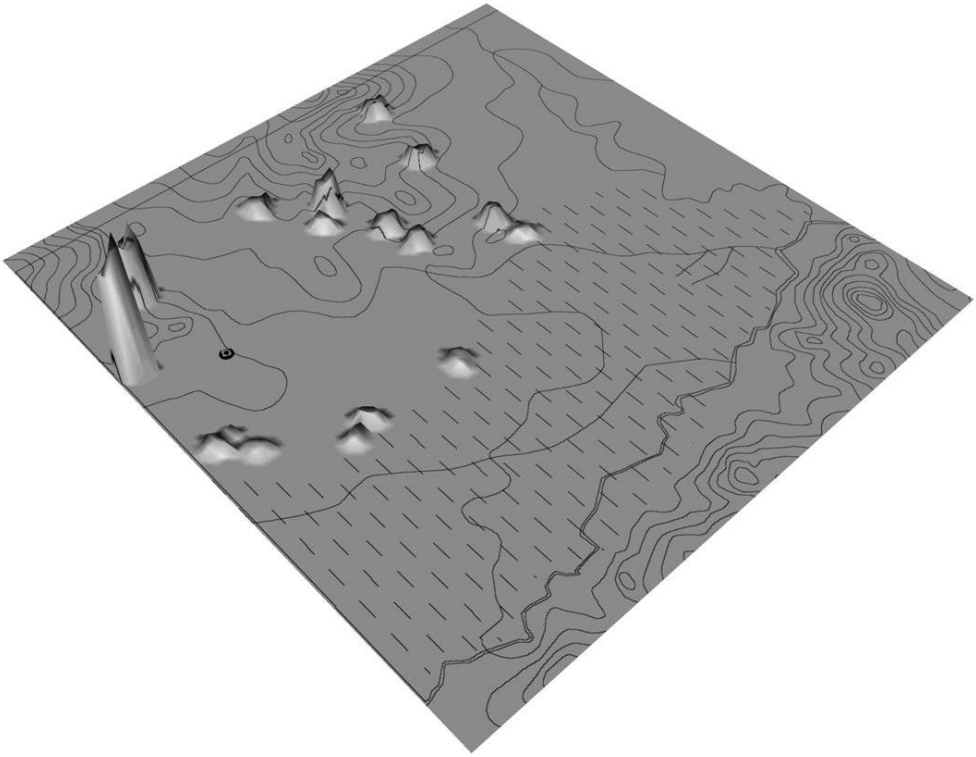

Figure 3.3 Distribution of occupation areas in zone B
(peaks indicate relative ceramic densities).

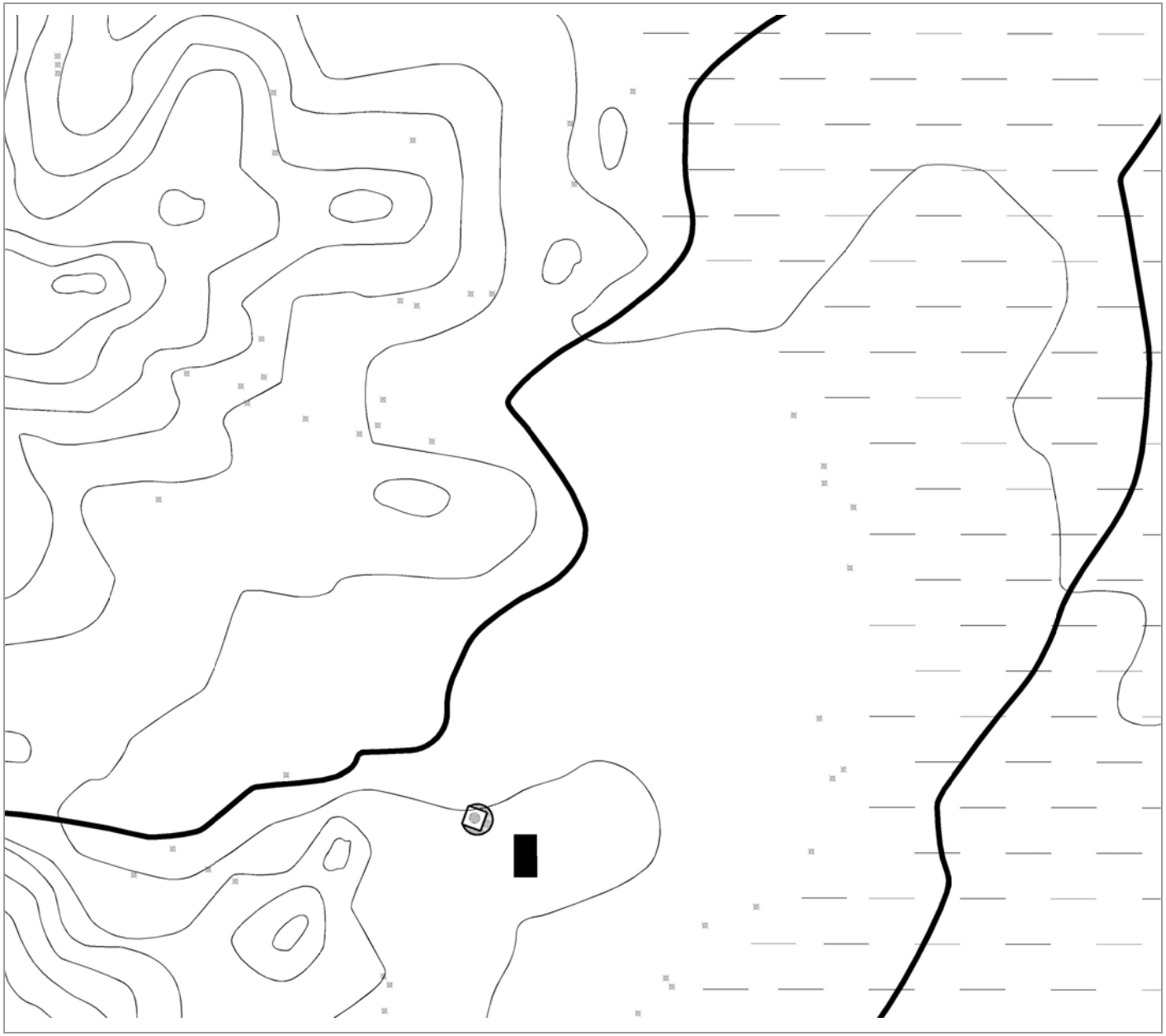

Figure 3.4 Distribution of positive shovel probes in Zone B with Late Bronze Age ceramics.

3.2.1 The Characteristics of Occupation Areas in Zone B

The topography in Zone B is slightly different than the one observed in Zone A. Although the overall nature of the landscape is the same, the western hills are more low-lying and are presently almost devoid of trees (which are nevertheless available a few kilometers away). I have also not observed any springs or seasonal streams in any of these mountainous locales. On the other hand, the presence of the aforementioned nearby three tributary rivers (now dry) indicates that this zone was once better watered. Not surprisingly, this part of the valley is where Soviet Era crop cooperatives were set up.

Six to seven identified occupation areas along the western foothills also characterize this zone (Figure 3.3). These are located between 1640 and 1660 m above sea level and are for the most part located within the confines of sheltered valley draws. The most significant aspect distinguishing these occupation areas is whether the draws within which they are situated are opened toward the east, as in Zone A, or toward the north—a setting that would not be ideal for sheltering against the northerly cold winter winds. Nevertheless, evidence of past and present occupation attests to the adequacy of these locations for habitation.

Overall, and similar to the situation in Zone A, the location of the occupations along the foothills suggests attempts on the part of the people living there to shelter themselves against the elements, and suggests once again an ideal winter campsite location.

The situation regarding the occupation areas along the Khanuy River floodplain is also somewhat similar to what is found in Zone A, except that there are no physical 'impediments' here due to floodplain activity that would restrict certain areas from being established as is the case in Zone A—which probably explains the dispersed pattern of positive shovel probes and the lack of clear patterning in this area (Figure 3.4). This does not mean, as is the case today, that

campsites were not separated from one another, but simply that nothing restricted people from setting up their campsites anywhere along this area, moving their camp from one year to another a few hundred meters on either side – thus producing overlapping palimpsests of occupations. For this reason, it is difficult to quantify the number of occupations in this area, although we may tentatively distinguish between 3 and 6 of them based on relative artifact densities. Regardless, the mostly two-tiered settlement system is still apparent.

3.3 POPULATION ESTIMATES

Consideration of population estimates is obviously important for determining population densities, as well as for evaluating, for example, such things as whether or not the labor force required to build the impressive monumental sites that dot the Khanuy Valley landscape was immediately available. It is also important for evaluating the nature and organization of societies (e.g. Chamberlain 2006; Hassan 1979, 1981).

Despite the lack of harder evidence such as Late Bronze Age house structures for helping to reconstruct population estimates, we are fortunate to have modern and historic census information (both human and animal) for making comparisons with modern and ancient settlement characteristics and distribution. As mentioned in the introductory chapter, this comparative data is especially relevant that the research area's climate and environment is similar to the Late Bronze Age's one and that the research area continues to be inhabited by mobile pastoralists whose settlement pattern is extremely similar to that of the Bronze Age, which in turn (at least today) is determined in large part by the needs of their herds of sheep, goat, cattle and horses. It is thus possible to use this information as analogical support and as a

check for estimates, and to suggest upper and lower limits of population densities within each occupation area. As mentioned above, the fact that occupation areas along the foothills are also located in clearly delineated valley draws of specific sizes can also be efficiently used as guidelines for evaluating upper and lower limits of population densities within each occupation area.

Ethnographic work on the part of this author as well as satellite imagery, provide information regarding modern campsite sizes and their organization in the research area. Expectedly, much variability characterizes camp organization, but some informative data is deemed helpful in the present effort to address population estimates. Based on concrete measurements taken on the ground and from satellite imagery, winter campsites have been found to be fairly extensive and to encompass on average some 1-2 ha in area. This area includes the habitation sites per se (i.e. *gers* or yurts—traditional Mongolian tent houses) as well as the adjacent structures that house the animals (i.e. pens, corals, etc.) (Figure 3.5). Further interviews with herders inhabiting these and other campsites have confirmed the extent of this approximate living area. That is, although there are no fences or visible delimiting features, herders were found to consider an area of about 2 hectares "theirs". This area also includes terrain with no structures and corresponds to what they perceive as adequate space for them and their animals (Figures 3.6 and 3.7). This space also assures a certain buffer area between camps (cf. Vainshtein 1980:83). Camps were found to comprise on average between 2 and 5 living '*gers*' (as opposed to storage '*gers*') or families.


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52 m
pointer 47 U 655373.39 m E 5325784.39 m N elev 1667 m Streaming 100%


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Figure 3.5 Satellite imagery showing the extent and organization of winter campsites in the Khanuy River Valley (photos produced with 'GoogleEarth').

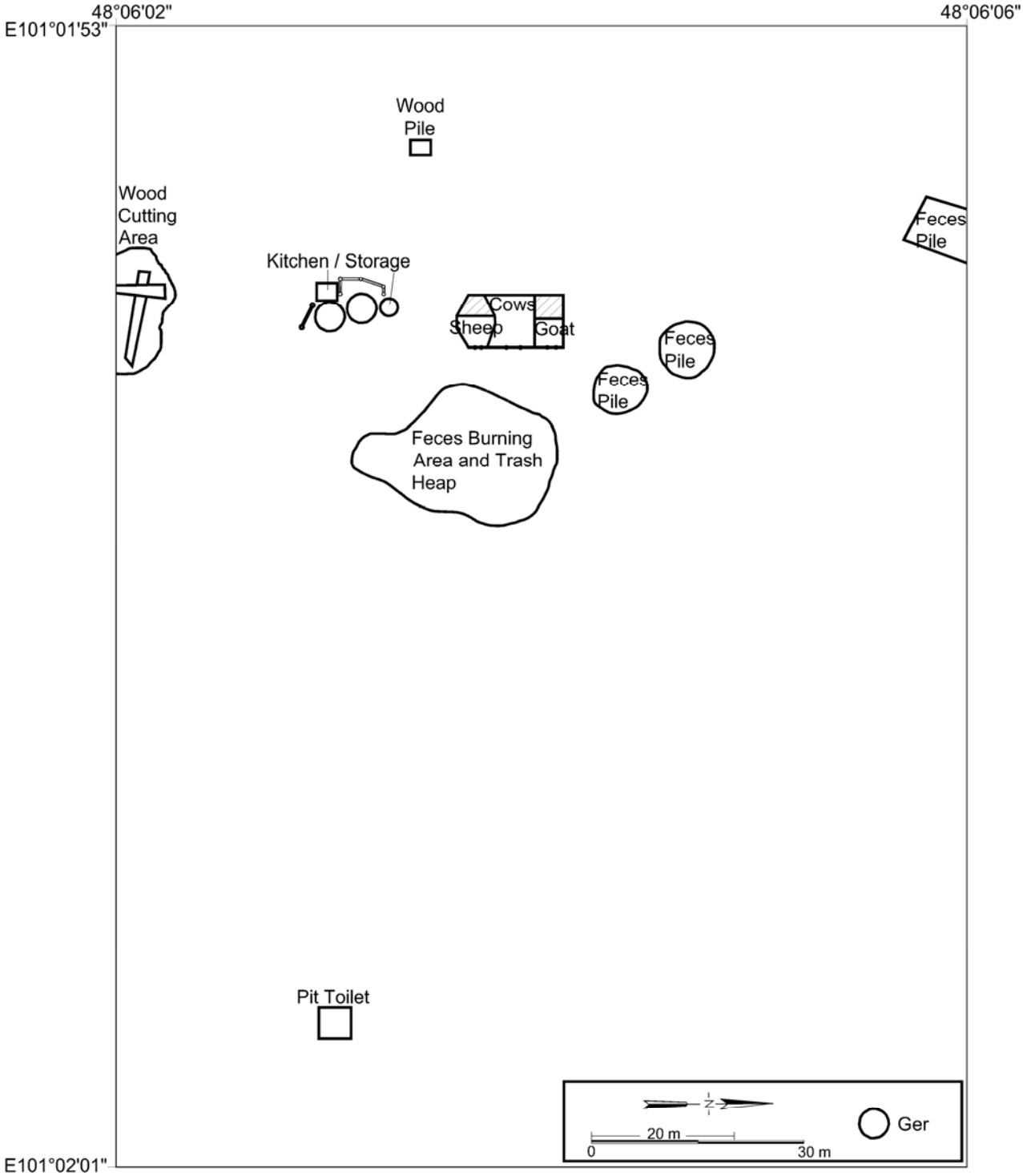

Figure 3.6 Plan of a winter campsite (Khanuy Valley, Mongolia).

Figure 3.7 Spacing between winter camps within a valley draw (Khanuy River Valley).

Similarly, ethnohistoric and ethnographic data both provide useful information for proposing upper and lower limits for population estimates. Census information ranging 75 years (i.e. 1930-2005) suggests that a relatively constant number of families/people have occupied the Khanuy Valley research area. Until 1998, and except for a few exceptions, livestock numbers have also been fairly constant (this consistency in livestock numbers apparently characterizes the whole of the Arkhangai *aimag* [Blench 2005:11, fig.10]). The average household size is 4 people, and each household owns about 65 head of livestock of various types (usually in decreasing order of sheep, goat, horse and cattle). This is an average for the Khanuy Valley as some families own more animals than others. These numbers, however, are also commensurate

to census information recorded in Tuva in the 1930s (Vainshtein 1980:57) and fit well with the minimal animal requirements for household viability (Cribb 1991:34, 40). For the reasons discussed in Chapter 1 and above, this information provides for the moment the best and most reasonable barometer for comparison with ancient 'settlement' characteristics in this area, and thus for proposing past population estimates.

Within the 20 km² survey area in Zone A, occupation areas encompass some 66 ha. These are represented in Figure 3.8 below by contour lines surrounding clusters of positive shovel probes no further than 200 m apart—a number commensurate to campsite sizes discussed above. Applying the population/area information presented above to the Late Bronze Age context provides an estimated maximum populace of between 264 and 660 for this period (i.e. 66 ha divided by 2 ha per camp with between 2 to 5 families per camp and 4 people per household). Eliminating the ca. 7 ha of occupation areas along the Khanuy River, assuming these are the summer campsite locations of the same people occupying the foothills during the winter months, would in effect only reduce the maximum estimated population to between 236 and 590 people (using the same calculations). Of course, the problem with this approach is that it does not make sense to wind up with 8 times as many people in the winter camps as in the summer camps if these are the same people living in both locations seasonally (but see discussion in section 3.6.1 below). Regardless, applying the animals per household ratio presented above would suggest an animal population of between 3835 and 9588 per 20 km². While the lower estimate is possible, but improbable if compared to ethnographically recorded data, the latter is certainly impossible as it corresponds to approximately 14 times the sustainable carrying capacity for this region of Mongolia. Indeed, studies in the Arbayasgalan *bag* (a region also located in Arkhangai province and which has similar environmental conditions as Khanuy Valley) suggest that a standard

sustainable winter carrying capacity in this part of Mongolia corresponds to about 106 'sheep units'[3] per km^2 for 202 days, which is the average time spent at a winter campsite (Rasmussen et al. 1999). The abovementioned higher animal population corresponds to an estimated 1524 'sheep units' per km^2! Certainly, carrying capacity is not a fixed number and depends on numerous variables such as technology, the structure of production and consumption, etc. Yet, these are clearly unreasonable numbers for this area and thus argue against the abovementioned human population estimates.

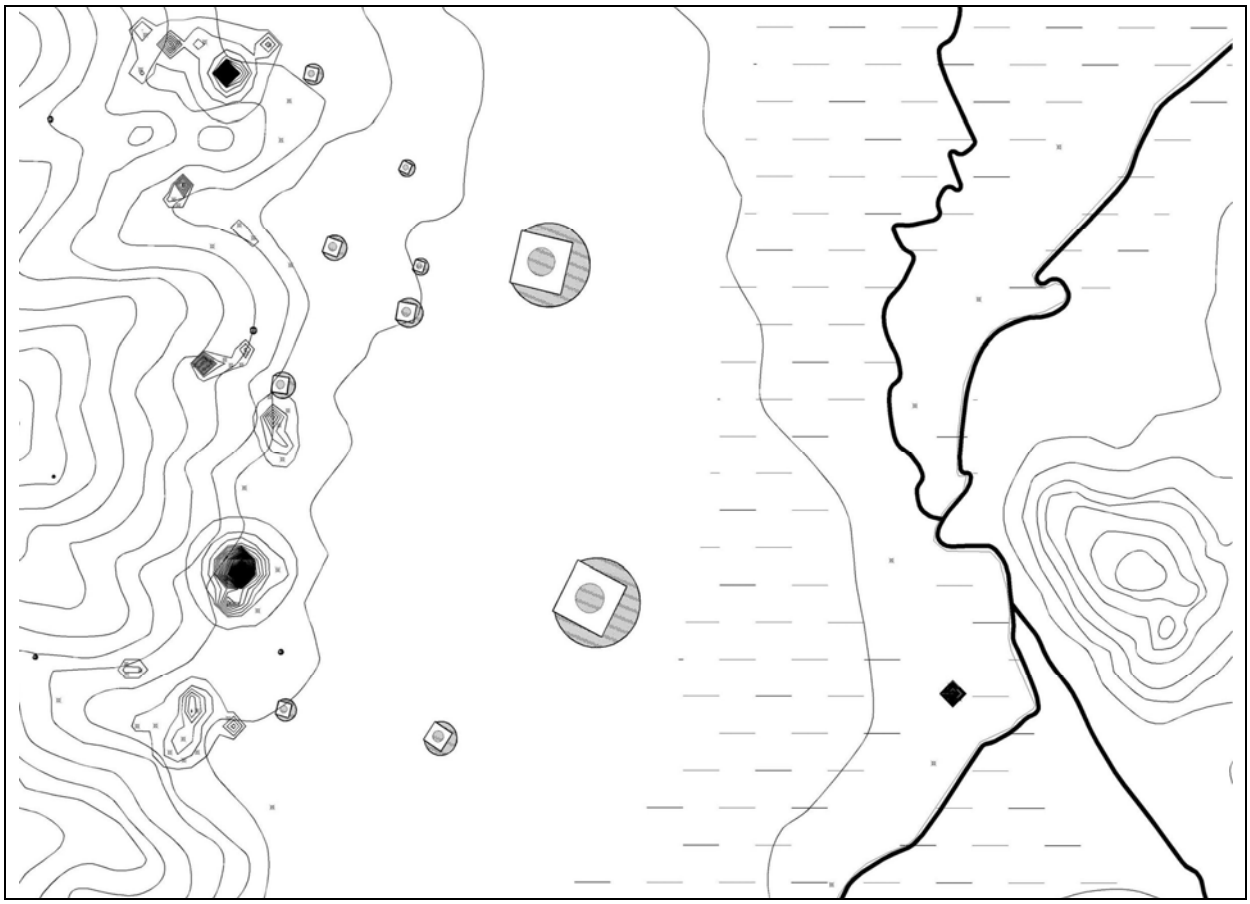

Figure 3.8. Density of occupation areas in Zone A.

[3] A 'Sheep Unit' is the unit used in Mongolia to determine livestock demand for forage (Mongolians have a traditional system of comparing across species by normalizing all animals to a single unit—the *bod*. One *bod* = 1 horse or cow or 6 sheep). The winter estimate is used here since the carrying capacity of an area is ultimately limited by its winter range (winter being the most difficult and lean part of the year in terms of pasture).

If, on the other hand, we consider these same occupation areas to reflect palimpsests of single 'settlements', then the minimal number of people in this zone would be between 120 and 300 (i.e. up to 8 occupation areas within the foothills and 7 along the Khanuy River—each comprising 2 to 5 families with 4 people per household). Eliminating the occupation areas along the river for the same reasons expressed above would reduce this number to between 64 and 160 people. These latter numbers approximate the present density of people per square kilometer in the research area, that is, some 78 persons per 20 km². Once the estimated animal population is considered (somewhere between 1040 and 2600 animals per 20 km²), these latter human population estimates become much more reasonable.

Similarly, the application of the same rationale for Zone B (Figure 3.9) suggests a human population of between 56 and 140 and an animal population of between 910 and 2275 for this 20 km² zone.

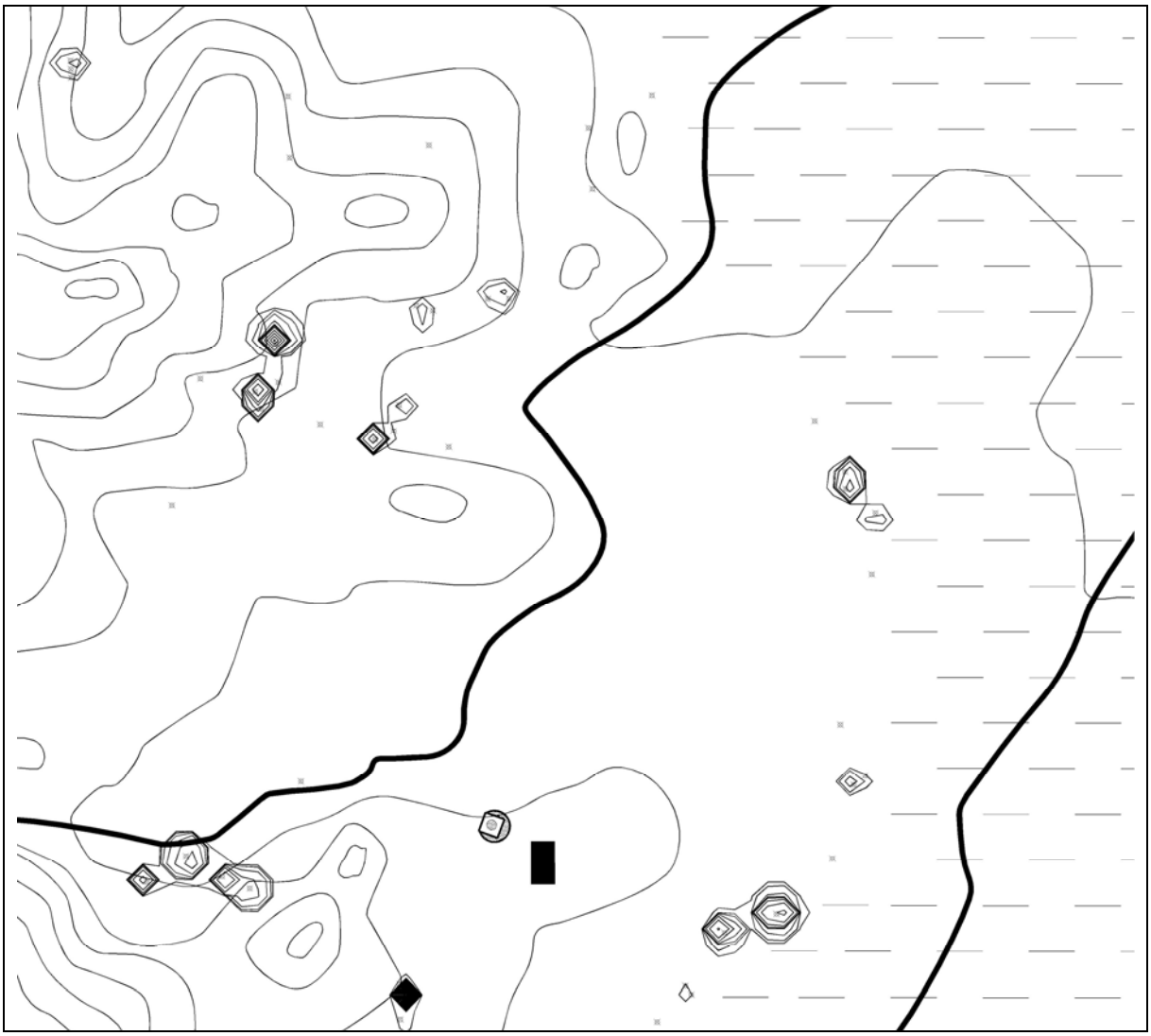

Figure 3.9 Density of occupation areas in Zone B.

These calculations based on the number of occupation areas alone, however, do not take into account the varying size and artifact density per area between different occupations—differences that are clearly visible when comparing the various sizes and densities of these occupations as expressed by the contour lines in Figures 3.8 and 3.9. Consequently, we lose important information that could help to account for the differing amounts of garbage (i.e.

ceramics, faunal remains, etc.) accumulated in different areas—differences that are probably linked to differing population densities and/or lengths of occupation.

3.4 POPULATION SIZE: THE RELATIVE DEMOGRAPHIC INDEX

It is possible, however, to work out relative population densities, which in turn can help characterize occupations more substantially than simple dots on a map can alone. The specific method used here for reconstructing a demographic index is based on an area-sherd density index (i.e. the area of a site multiplied by the density of sherds) derived from the regional survey data. This combined index merges both the area distribution of artifacts and the amounts of artifacts within the areas and thus avoids some of the shortcomings of using only one or the other indexes alone (see discussion of this procedure in Drennan et al. 2003). Such indexes have been used successfully in regional settlement analysis of sedentary agricultural populations (Drennan et al. 2003; Haller 2004). When applied in a setting where occupation is more mobile, these indexes reflect some combination of population levels and length or intensity of seasonal occupation. That is, a higher index for a particular area of occupation (resulting from a higher sherd density and/or a larger area) suggests either a greater number of people, or lengthier or more frequent reoccupation, or both, during the Late Bronze Age.

3.4.1 Results: Zone A

Figure 3.10 below shows the topographical representation of the relative demographic index for Late Bronze Age occupation areas in Zone A (Table 3.1). Three occupation areas have similar indexes, while 2 others have an index twice as large. One occupation area, however, stands out in

particular with a density-area index more than 2 times higher than the next largest ones. This occupation area is not located in a particularly large valley draw (like the two other ones with an intermediate index), nor does its setting differ in any sorts from the surrounding ones. Consequently, since it is not favored or disfavored ecologically, it can be assumed that this particular occupation area either housed a greater number of people, or that people occupied this area for a longer period of time or more frequently than elsewhere in Zone A.

Another important characteristic of the differential occupation in Zone A that needs comment is the important difference between the density-area indexes of the occupation areas along the foothills and those along the Khanuy River. The ones with the smallest index along the foothills are still 5 times as large as the ones near the river. Clearly, there is an important difference in occupational density between these two locales and suggests either much lower population levels and/or a shorter or less intense seasonal occupation along the Khanuy River. Indeed, the observed difference could be the product of a temporary/seasonal influx of population in the foothills area. This is certainly not impossible since even presently, as discussed in Chapter 1, the human and animal population almost doubles in the area during the winter months when incoming families from neighboring regions/valleys temporarily settle here. It could also be the case that the difference we observe is the product of seasonal movement. That is, in this scenario, just as it is the case today, herders move seasonally from the foothills to the Khanuy River and back again, spending twice as much time at their winter campsite along the foothills (i.e. at least 8 months) than they do at their summer camp location along the Khanuy River (i.e. no more than 4 months). There is also much less investment in summer campsite structures than at winter campsite locations (cf. Kent and Vierich 1989 for a hunter and gatherer example). There is no reason, of course, that both these causes could not together explain the

important difference in occupational density between these two areas—differences that could be linked to seasonal activities of various sorts, including ones linked to the building and/or use of *khirigsuurs*, which, I remind the reader, were mainly built (used?) in the late fall. Certainly, this seasonal influx of people and animals into slope areas only would explain the important difference in the density-area index between the foothills and the river that should otherwise be expected to only be twice as small along the river if based only on length of occupation.

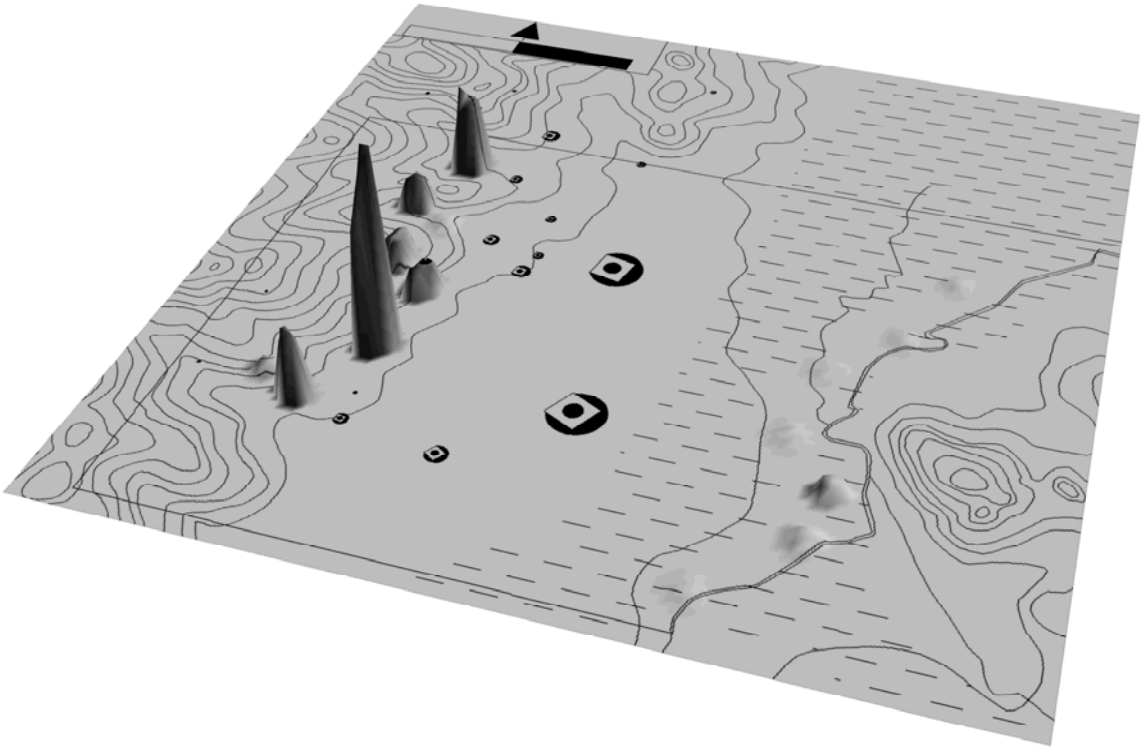

Figure 3.10 Topographical representation of the relative demographic index for Late Bronze Age occupation areas in Zone A.

Table 3.1 Density-Area Index for all occupation areas (numbers in left column correspond to peaks in figure 3.10 – from top to bottom and from left to right).

OCCUPATION AREAS	DENSITY-AREA INDEX
Foothills	
1	7.92
2	3.12 + 0.48
3	3.84
4	3.36
5	18.96
6	7.44 + 1.44
Riverside	
7	0.24
8	0.24
9	0.24
10	0.24
11	1.44
12	0.72
13	0.24

3.4.2 Results: Zone B

The same methodology described for Zone A was used again here for developing a relative population index for Zone B (Table 3.2). Once again, there is a clear density-area index difference between occupation areas located along the foothills and those located near the floodplain. Furthermore, one to two sites stand out in particular. These are represented graphically below as the two highest peaks in Figure 3.11. More so than in Zone A, there is a clear variation in occupational density in Zone B, with the 'sites' with the highest density-area index located close together along the foothills in the southern part of this zone. They are also located the nearest to the monumental structures in this zone (i.e. *khirigsuur*, deer-stone site and

‘slope’ burials). Although occupation areas are distributed in all of the valley draws along the foothills, this important difference in occupational density does suggest either much higher population levels and/or a lengthier or more intense seasonal occupation in this part of the valley.

Table 3.2 Density-Area Index for all occupation areas (numbers in left column correspond to peaks in Figure 3.11 – from top to bottom and from left to right).

OCCUPATION AREAS	DENSITY-AREA INDEX
Foothills	
1	0.96
2	0.96
3	1.92
4	0.72
5	0.96 + 0.96
6	0.72
7	3.84
8	8.64
Near Floodplain	
9	1.2 + 0.48
10	0.48
11	0.72
12	0.48
13	0.48
14	0.72

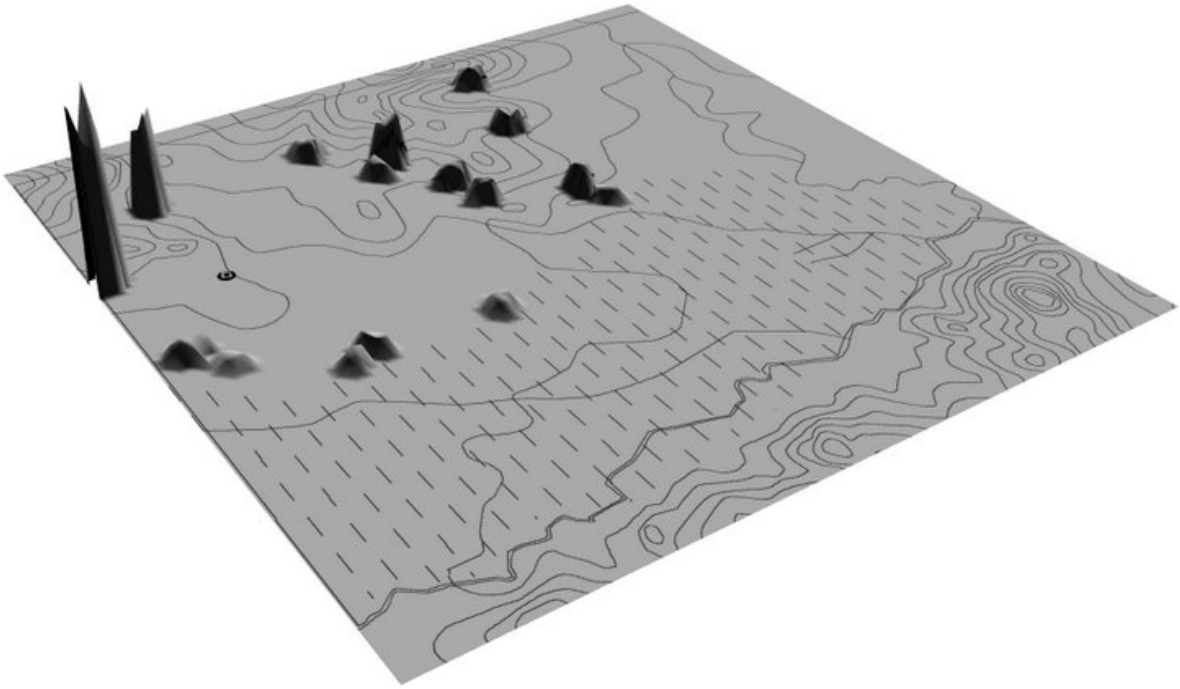

Figure 3.11 Topographical representation of the relative demographic index for Late Bronze Age occupation areas in Zone B.

Clearly, the different relative population information revealed by the density-area index is more informative than what the location and simple count of 'sites' alone provide. It suggests not only different patterns within each zone, but that these settlement patterns and concomitant densities may have something to do with their location within the landscape, particularly in terms of seasonality and in their relation to the monumental structures. This is the subject of the next section.

3.5 CENTRALITY: EVALUATING MONUMENT AND SETTLEMENT RELATIONSHIPS

As discussed in Chapter 1, the monumental landscape in the Khanuy Valley suggests supra-local centralized organization, and thus the expression of what seems to be central places. While the scale of some of these monuments as well as the elaborate seasonal ceremonial activities carried out at these complexes suggest higher centrality in at least the ritual and funerary spheres, it was unknown if this centrality also involved the sphere of the living. That is, is there evidence of demographic centralization as well and did these monuments play a role in creating bounded territorial human communities? The evaluation of this rests especially, but not uniquely, in the analysis of occupation areas in Zone B, since this zone encompasses the tail end of such a *khirigsuur* cluster as well as a "buffer zone" with no burials or *khirigsuurs*.

The number of occupation areas is fairly evenly distributed within Zone B (i.e. in every valley draw and at regular intervals along the river's floodplain) and there is apparently no overall 'settlement' centralization (Figure 3.11). The relative density-area index, however, suggests much greater occupational density at two occupation areas: those that are the nearest to a 'slope' burial complex and to the *khirigsuur* and major deer-stone sites. In terms of 'site' size, these occupation areas are not much different than the others, yet there is clearly much more activity, be it seasonal, at these two occupation areas—notably at the one directly facing the monumental structures. Its relative population index is more than double its nearest neighbor and over five times as large as the average occupation area in this whole zone.

Moreover, once the total density-area indexes are compared for both zones A and B, it is interesting to note that the index is twice as high in Zone A as it is in Zone B (49.91 compared to

24.24). Zone A is, noticeably, at the center of an important cluster of monumental structures. Therefore, although we cannot speak of an overall concentration of occupation areas, there does seem to be a concentration of increased activity at habitation sites that are closer to burials and monumental structures. This activity could be linked to either the presence of a greater number of people, or a lengthier or more frequent reoccupation of these areas during the Late Bronze Age. While this is an equifinality issue that eventually needs to be resolved—possibly through more focused research at the household/campsite level of inquiry—it is clear that monuments in the valley did play a role in binding people together more so than just in death.

3.6 SUMMARY

A systematic stratified comparative survey program was carried out in two zones with distinctively different densities of monumental sites. The objective was to identify occupation areas in order to discuss settlement patterning, population estimates and the possibility of demographic centralization. The results of the survey work presented in this chapter have made it possible to draw fairly strong conclusions about the nature of settlement in the research area. It has also allowed for the documentation of the overall settlement system.

Within both zones A and B there is a clear patterning of settlements into two discrete areas: one along the foothills (the location of present-day winter campsites) and one along the Khanuy River, or its floodplain (the location of present-day summer campsites). There was no evidence of settlement between these areas. Given that this pattern mimics perfectly the present-day one in this region, it strongly suggests that this represents a time-tested settlement system that seems to be linked to seasonal changes. Moreover, the distance between both of these areas

of occupation is less than 5 km and thus suggests, as is the case today, a highly restricted form of mobility within a region that must concomitantly be of constant and high productivity all year round. In addition, the survey has revealed a fairly regular distance between occupation areas, which suggests some kind of social spatial buffering principle that allots equally sufficient pastoral resources to each campsite while minimizing distances between households—a pattern which today is known to facilitate communication and cooperation between households. Finally, the comparative survey at a larger scale (Zone A vs. Zone B) and resulting population estimates based on an area/sherd density index suggests demographic centralization, one that is linked to the monumental landscape. In other words, this overall settlement patterning clearly suggests a centralized (possibly even supra-local) type of social organization that is linked to what can effectively be termed 'central places'.

4.0 ARCHAEOLOGICAL EXCAVATIONS OF OCCUPATION AREAS

The overall objective set out by test-excavating a number of occupation areas was to yield larger artifact assemblages from domestic contexts than could be obtained from shovel probes alone in order to better sample variation between areas of occupation. The trade-off of such a sampling approach is, of course, exchanging great detail about a few occupations for less detail about many occupations. Since very little information was previously known about Late Bronze Age habitation sites, a more limited spatial investigation would have decreased the likelihood that the occupation areas investigated were representative. As a first investigative step, therefore, the more extensive sampling procedure used in this study at least assures a greater likelihood that the sample of occupation areas includes the fullest range of habitation sites in the region during this period of time.

4.1 EXCAVATIONS

Of the 23 or so occupation areas identified through the survey work and represented by clusters of positive shovel probes, 14 were further stratigraphically test excavated in order to provide larger samples of artifacts, as well as botanical and faunal remains so as to enable the reconstruction of mobility patterns, subsistence strategies, economic specialization, and social ranking. Eight occupation areas were test excavated in Zone A (5 along the foothills [BMK, WFA, JUL, QUE, MAC] and 3 along the Khanuy River [SHA, MAB, MTC]) (Figure 4.2), while

6 occupation areas were test excavated in Zone B (4 along the foothills [TOP, SOV, SAL, HUN] and 2 along the floodplain of the Khanuy River [HOA, GER]) (Figure 4.12). Seven or eight 2 x 2 m units were spread across each of these 14 areas of occupation. I opted to use both strategically placed units as well as arbitrarily located units. The former were located in denser areas of positive shovel probes known from the survey results described in Chapter 3 with the intent to potentially yield more artifacts for comparative analyses, while the latter (located arbitrarily within the site boundaries) were occasionally used to attain the desired seven to eight 2 x 2 m units per site. This was done when positive probes making up the site were too few to guide us toward preferential locations of high artifact density.

4.2 STRATIGRAPHIC SETTING AND EXCAVATION METHODS

The relatively arid steppe soil which covers not only the lowland but also the rocky hills and mountains in the research area is a sandy-gravely (sometimes rubbly) chestnut soil poor in humus content (Munsell 10YR 3/2 to 4/4). The A-horizon soil stratum almost never exceeds 20 cm outside the floodplain and overlies a gravely layer. This gravely layer is ubiquitous throughout the valley's research area and sometimes includes coarser pebble to cobble clast size rocks. A sandy to clayey grayish often compact and mostly sterile layer underlies the whole sequence. The former, and occasionally the latter when the gravely layer was not clearly present, formed the stratigraphic limit of the excavations. As clear stratigraphic layers have not been seen in previous excavations in the evenly deflating steppe of central Mongolia, these units were excavated by arbitrary levels of 5 cm using a trowel until the sterile layer was reached (often no more than around 20 to 30 cm below the surface) (Figure 4.1). All soil was systematically

screened through 6 mm wire mesh. These excavations confirmed the lack of clear stratigraphic layering, although soil samples were taken from seven exposed contexts to test for microstratigraphy. The results of these soil samples are not yet available.

Figure 4.1 Example of the average depth of excavation units.

While all artifacts (and ecofacts) within a unit were recorded according to the stratigraphic context within which they were excavated, diagnostic artifacts, diagnostic faunal remains, as well as features and samples were recorded more precisely using three dimensional coordinates and labeled accordingly. Organic materials were collected from good/secure contexts for eventual radiocarbon dating and particular care was taken to recover faunal and botanical remains in these excavations through both systematic screening (using both 6 mm and occasionally 3 mm wire mesh to verify that we were not missing bones of small mammals, birds or fish) and flotation.

4.3 DESCRIPTION OF OCCUPATION AREAS

The following section summarizes the results of the excavations at each of the investigated fourteen occupation areas (Figures 4.2 and 4.12). The artifacts recovered consist primarily of ceramics and faunal remains dating to both the Late Bronze Age and Iron Age Xiongnu periods, although a small number of Turkic and Mongol period ceramics have been found as well. For the purpose of this study, only the Late Bronze Age material is presented. Information is given on the location and general context of each occupation area, as well as the type of material recovered. The size (in hectares) of occupation areas provided here is based on the definition of 'sites' provided in Chapter 2.

4.3.1 ZONE A

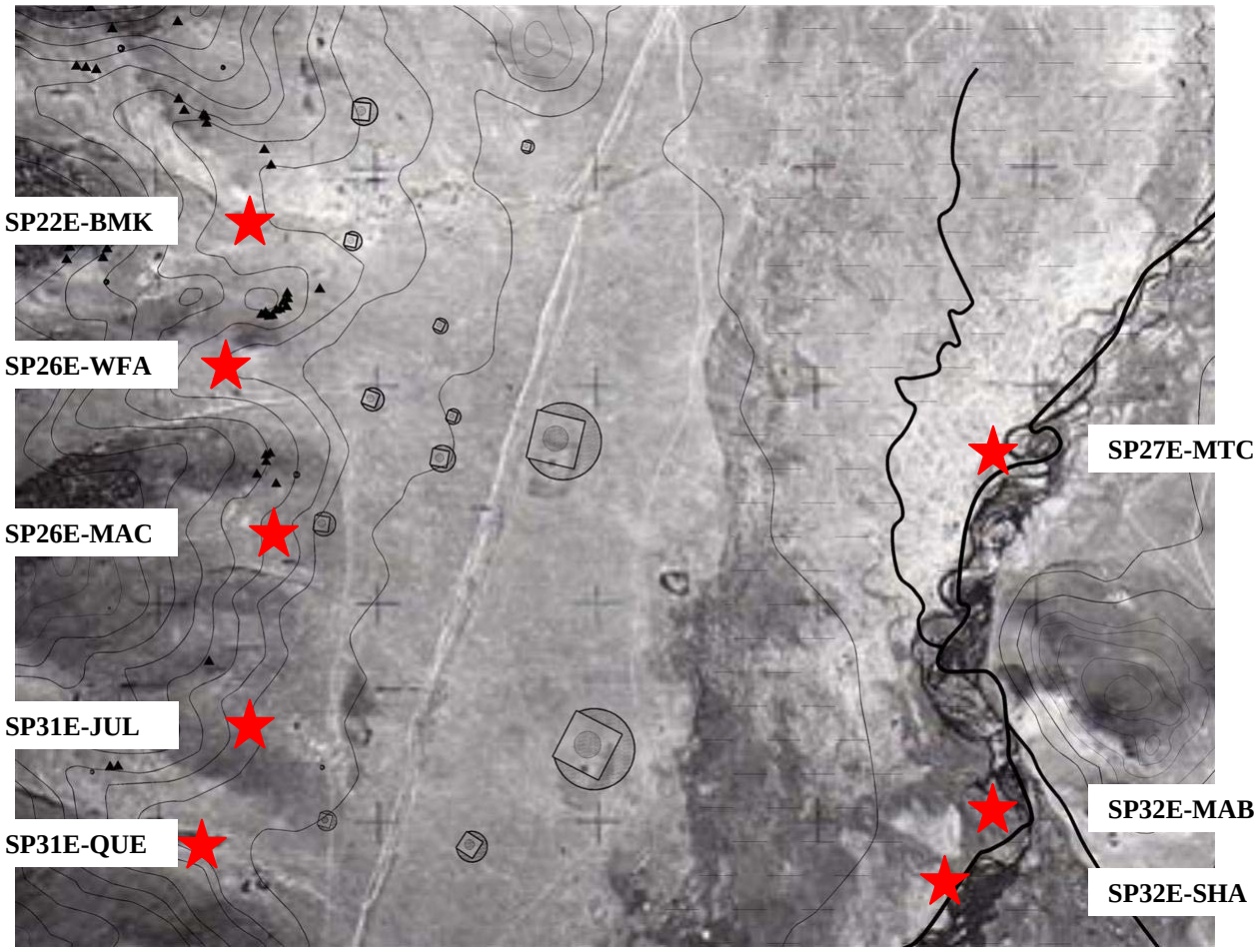

Figure 4.2 Location of occupation areas excavated in Zone A.

SP22E-BMK

GPS Coordinates: 48°06'05" N 101°02'10" E (Zone 47U N: 5329574 N 651583 E)

Site Context: Mixed Bronze Age and Iron Age/Xiongnu (and 1 Turkish Period ceramic).

This occupation area is located within a fairly large and flat valley draw along the western foothills, with little to no vegetation other than grass. Cutting the draw in two parts is a seasonal stream that, nonetheless, provides water year-round deep inside the draw. The site, which consists of a cluster of widely dispersed positive shovel probes, is the largest area of occupation in the research region and covers some 20 ha. This large occupation area is also flanked by 3 to 4 clusters of 'slope' burials on its northern side and by 1 cluster of 'slope' burials on its southwestern side, for a total of 17 such burials (see Figure 2.4). This is the largest number of 'slope' burials within a single draw, and the different clusters of burials may presumably relate to distinct families (Frohlich et al. Forthcoming). Today, some 2 to 3 campsites set up in this valley draw during the winter months.

Eight strategically placed 2 m x 2 m units were excavated here (Figure 4.3). Units were excavated to an average maximum depth of between 15 and 20 cm, with most of the artifacts found between 10 and 15 cm below the surface.

This occupation area revealed less Late Bronze Age material than expected on the basis of the survey results. Of the 112 sherds belonging to the three time periods specified above, only 36 were Late Bronze Age. However, some mistakes were made in the positioning of excavation units. Some of these were placed near probes with high Iron Age Xiongnu material instead of near probes where Late Bronze Age material had been previously found. This may explain the discrepancy. Nevertheless, the Late Bronze Age component of this occupation area did reveal

interesting material, notably faunal remains associated with all four main domesticates for this period of time, that is, sheep, goat, horse and cattle (see Chapter 5).

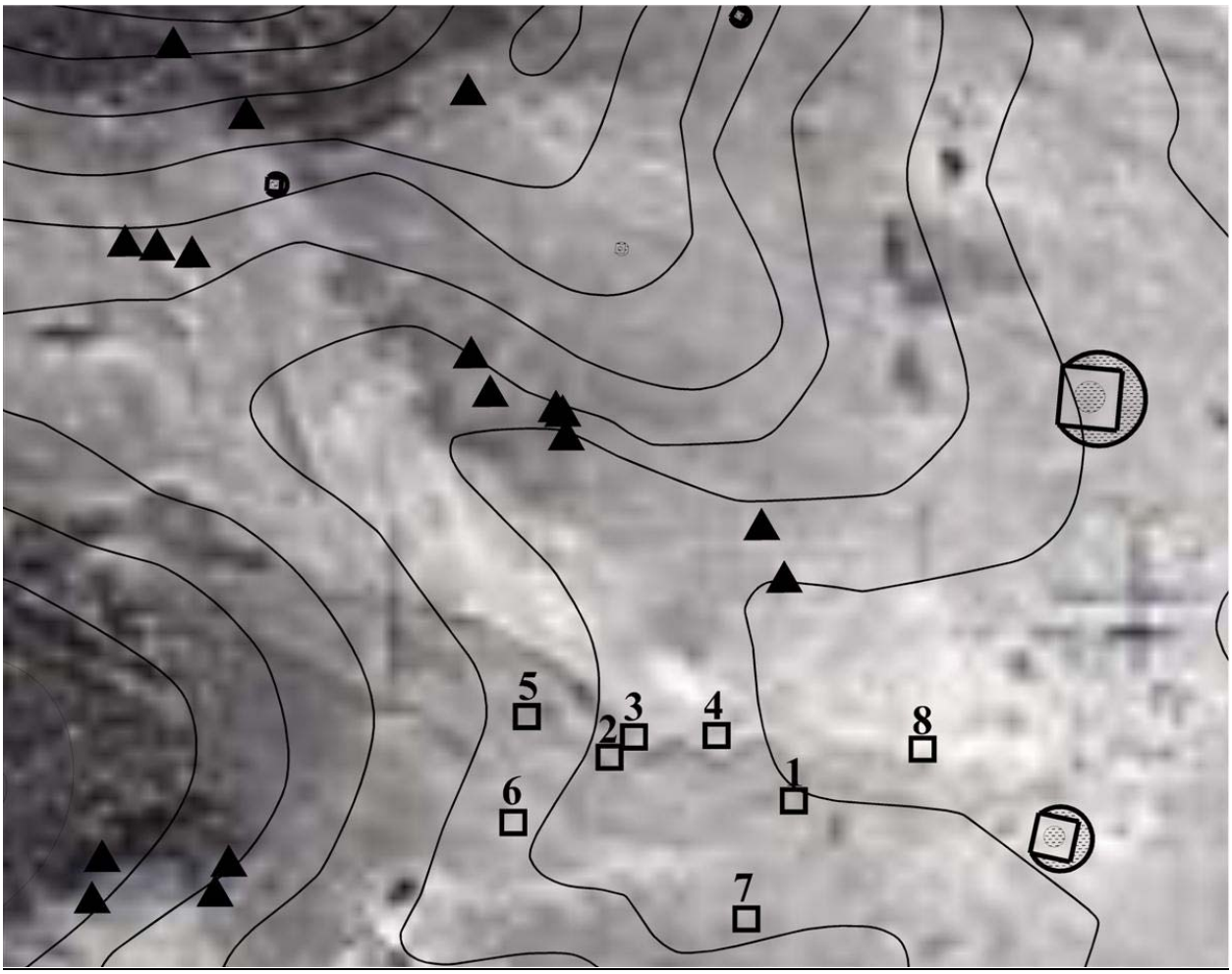

Figure 4.3 Location of excavation units at SP22E-BMK
(units not to scale – refer to Figure 4.2).

SP26E-WFA

GPS Coordinates: 48°05'47" N 101°02'08" E (Zone 47U N: 5329017 N 651556 E)

Site Context: Mixed Bronze Age and Iron Age/Xiongnu

This occupation area is also located within a fairly large draw along the western foothills, but the fact that a seasonal stream cuts the site in two reduces its livable area. A slight to moderate southeasterly trending slope characterizes the area itself, with little to no vegetation other than grass. Two clusters of positive shovel probes make up the occupation area in question, respectively encompassing areas of 1.2 ha. and 0.5 ha. A group of 11 'slope' burials are located to the northeast of this occupation area within this valley draw (see Figure 2.4). Today only 1 to 2 camps are set up here during the winter.

Eight strategically placed 2 m x 2 m units were also excavated here (Figure 4.4). Units were excavated to an average maximum depth of between 15 and 20 cm, with most of the artifacts found between 10 and 15 cm below the surface.

Excavations at this site yielded 112 sherds belonging to both the Late Bronze Age and Iron Age Xiongnu periods, 56 of which were Late Bronze Age. Here too, the four main domesticated species during this period of time were unearthed (sheep, goat, cattle and horse).

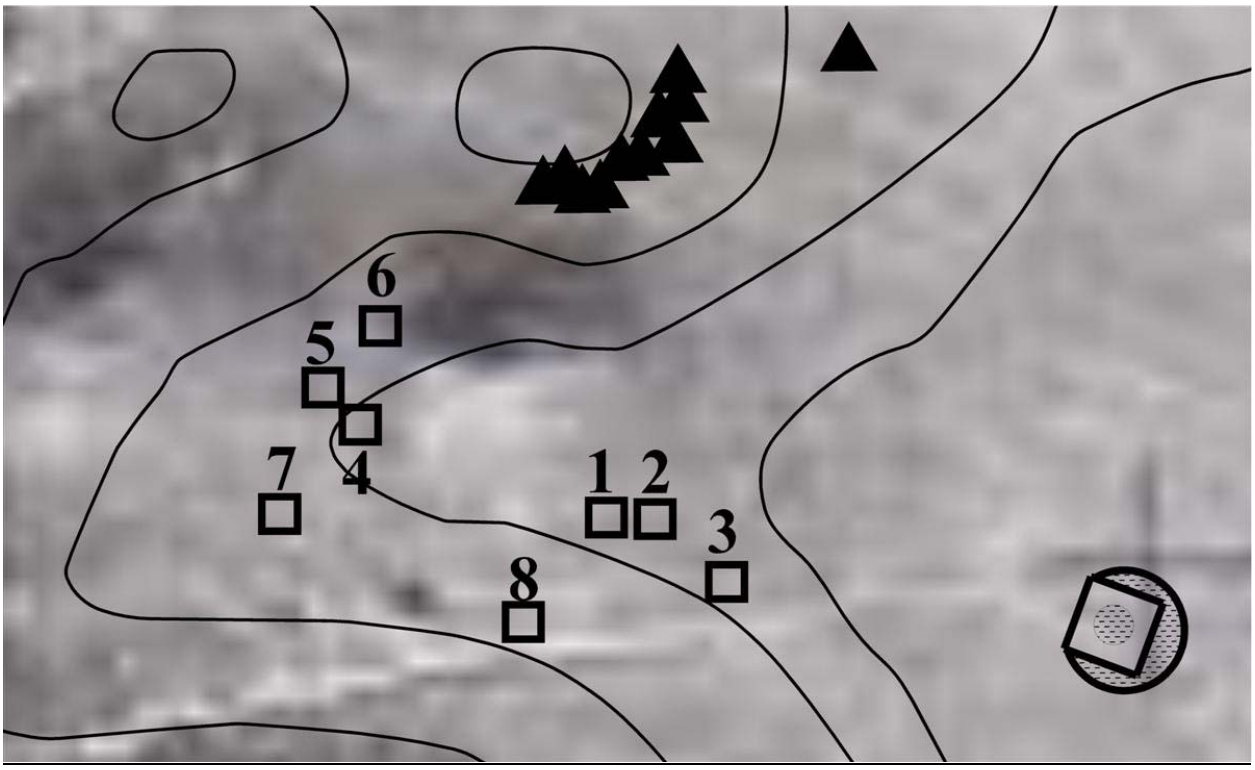

Figure 4.4 Location of excavation units at SP26E-WFA
(units not to scale – refer to Figure 4.2).

SP26E-MAC

GPS Coordinates: 48°05’23” N 101°02’16” E (Zone 47U N: 5328281 N 651741 E)

Site Context: Mixed Bronze Age and Iron Age/Xiongnu.

The location of this occupation area is within a valley draw along the western foothills and down-slope (south) from a concentration of six Late Bronze-Age ‘slope’ burials (see Figure 2.4). This occupation area was briefly discussed in Chapter 3 because, according to present-day local herders, it is not located in a particularly good setting. The site is one of the smallest occupation areas (ca. 2 ha) along the foothills and is located on a small elevated and uneven terrace which is open to the prevailing winds. A slight slope characterizes the area itself, with little to no

vegetation other than grass. Despite its odd setting, the site is consistent with the location of modern-day winter/fall campsites in the valley. No one has inhabited this occupation area in living memory.

Contrary to all other test excavations related to this research project, this occupation area was excavated in 2007, and the site sampling procedure was a bit different. An 8 m x 2 m trench unit was originally opened in an area of previously known high artifact density discovered in 2004, and four additional 2 m x 2 m arbitrarily located units within the site boundaries were opened in order to further sample the site as a whole (Figure 4.5). For the analytical purposes of this study, the 8 m x 2 m trench was divided into four 2 m x 2 m units. Together with the above mentioned four additional units, these provided the desired eight 2 m x 2 m sampling units this study set out to test. Units were excavated to a maximum depth of 25 cm, with most of the artifacts found between 10 and 20 cm below the surface.

In spite of its small size, excavations at this occupation area revealed an amazing amount of Late Bronze Age and Iron Age Xiongnu material. Excavations yielded 496 sherds belonging to both the Late Bronze Age and Iron Age Xiongnu periods, 61 of them belonging to the Late Bronze Age. Sheep/goat and horse bones were also recovered. Flotation samples from two promising contexts were taken at this site. The two samples came from 'featureless' units, but where a fair amount of charcoal, burnt bone and ceramics were uncovered. This will be further discussed in Chapter 5.

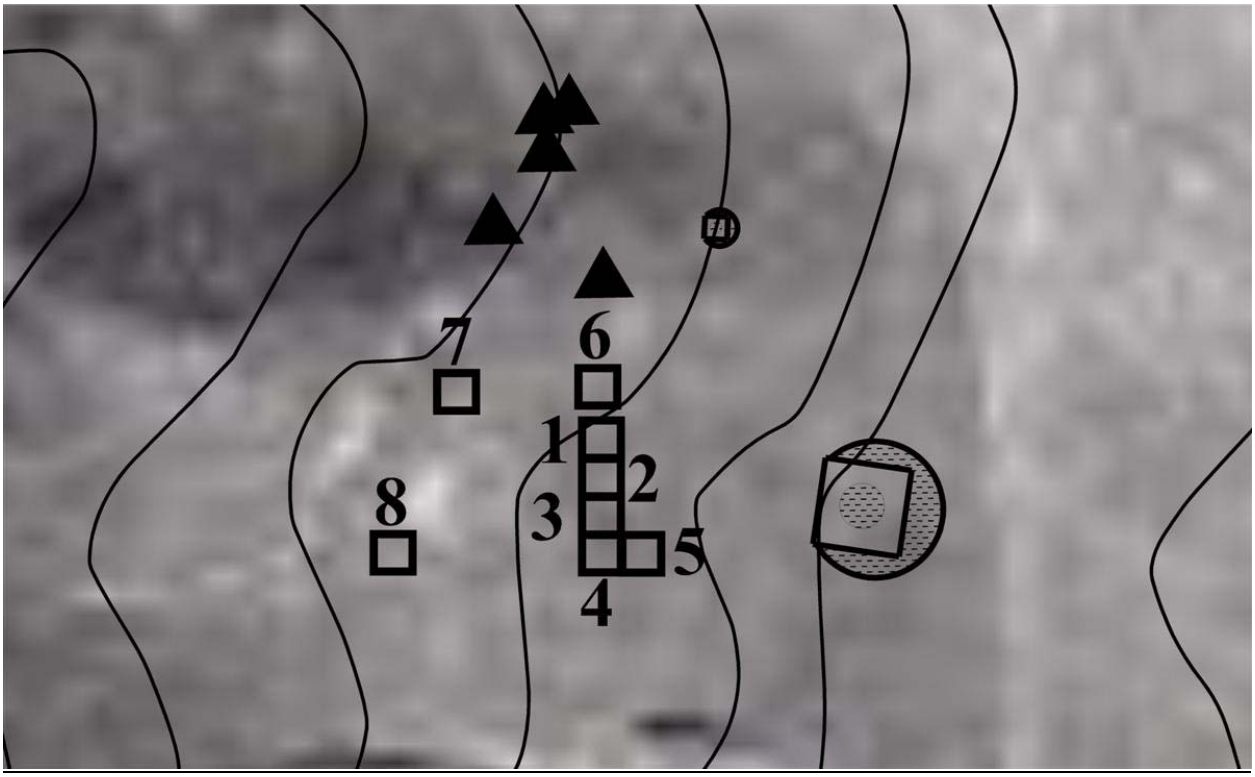

Figure 4.5 Location of excavation units at SP26E-MAC
(units not to scale – refer to Figure 4.2).

SP31E-JUL

GPS Coordinates: 48°04’50” N 101°02’22” E (Zone 47U N: 5327265N 651893 E)

Site Context: Mixed Bronze Age and Iron Age/Xiongnu (one sherd may be Medieval).

This occupation area is located in a shallow but fairly wide draw along the same western foothills and offered the highest population index for the whole research area (see Chapter 3). The site itself, which is the second largest area of occupation in the research region, covers some 18 ha. A slight east/northeastern trending slope characterizes the terrain, with little to no vegetation other than grass. Despite having revealed the highest population index, only one

‘slope’ burial is located within this draw (see Figure 2.4). Today only one campsite is usually set up here during the winter.

Eight strategically placed 2 m x 2 m units were excavated here as well (Figure 4.6). The maximum depth of excavations varied between 15 cm and 30 cm, with most of the artifacts, nevertheless, found again between 10 and 15 cm below the surface.

Excavations yielded 212 sherds belonging to both the Late Bronze Age and Iron Age Xiongnu periods, 149 of them belonging to the Late Bronze Age. Here again, domesticated faunal remains probably associated with sheep/goat (medium sized mammals) and horse/cattle (large sized mammals) were identified (see Chapter 5).

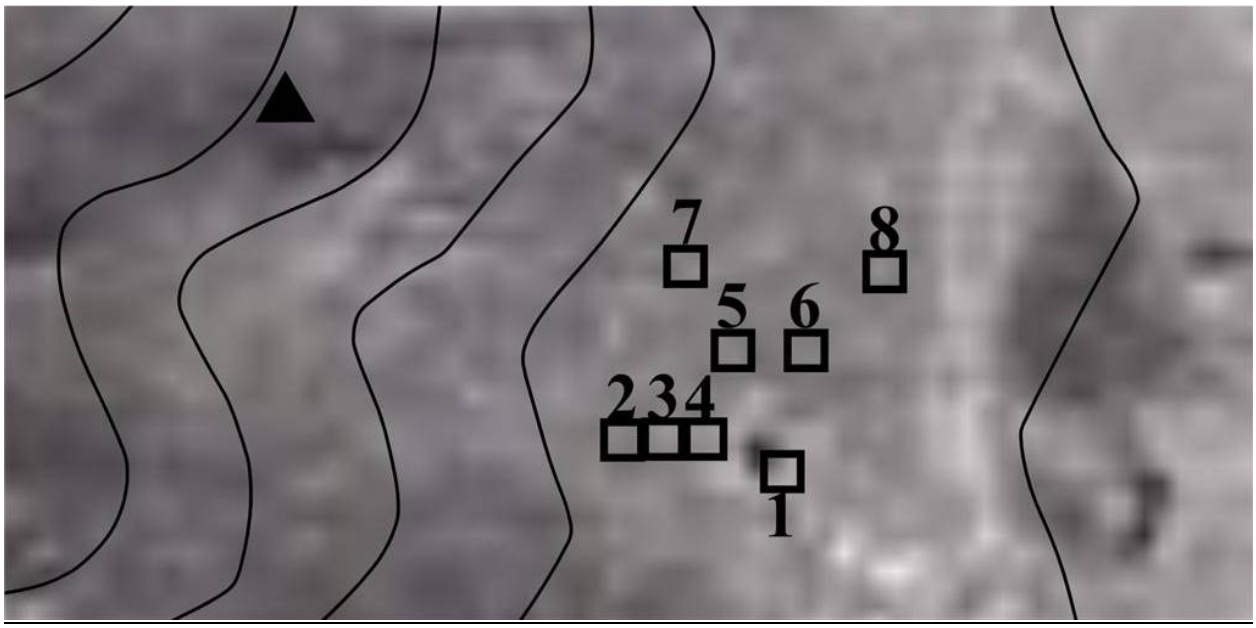

Figure 4.6 Location of excavation units at SP31E-JUL (units not to scale – refer to Figure 4.2)

SP31E-QUE

GPS Coordinates: 48°04'33" N 101°02'15" E (Zone 47U N: 5326737 N 651762 E)

Site Context: Mixed Bronze Age and Iron Age/Xiongnu

This occupation area is located within a fairly large but narrow draw along the western foothills. A seasonal stream also crisscrosses the site, although year-round access to water can be found deep inside the draw. The terrain on which the site is located is fairly flat with only very slight slopping in some areas, and is characterized by grassy vegetation. Two clusters of positive shovel probes make up the occupation area in question, respectively encompassing areas of 11.5 ha. and 0.08 ha. Along with SP22E-BMK, this occupation area revealed the highest population index after SP31E-JUL (see Chapter 3). Despite this high population index, only two 'slope' burials are located within this draw (see Figure 2.4). Here also, usually only one campsite presently occupies this draw during the winter time.

Eight strategically placed 2 m x 2 m units were excavated here (Figure 4.7). The maximum depth of excavations varied between 15 cm and 25 cm, with most of the artifacts, once again, found between 10 and 15 cm below the surface.

Of the 354 Late Bronze Age and Iron Age Xiongnu ceramic sherds excavated here, 166 belong to the Late Bronze Age. Here also, the four main domesticated species during this period of time were unearthed (i.e. sheep, goat, cattle and horse).

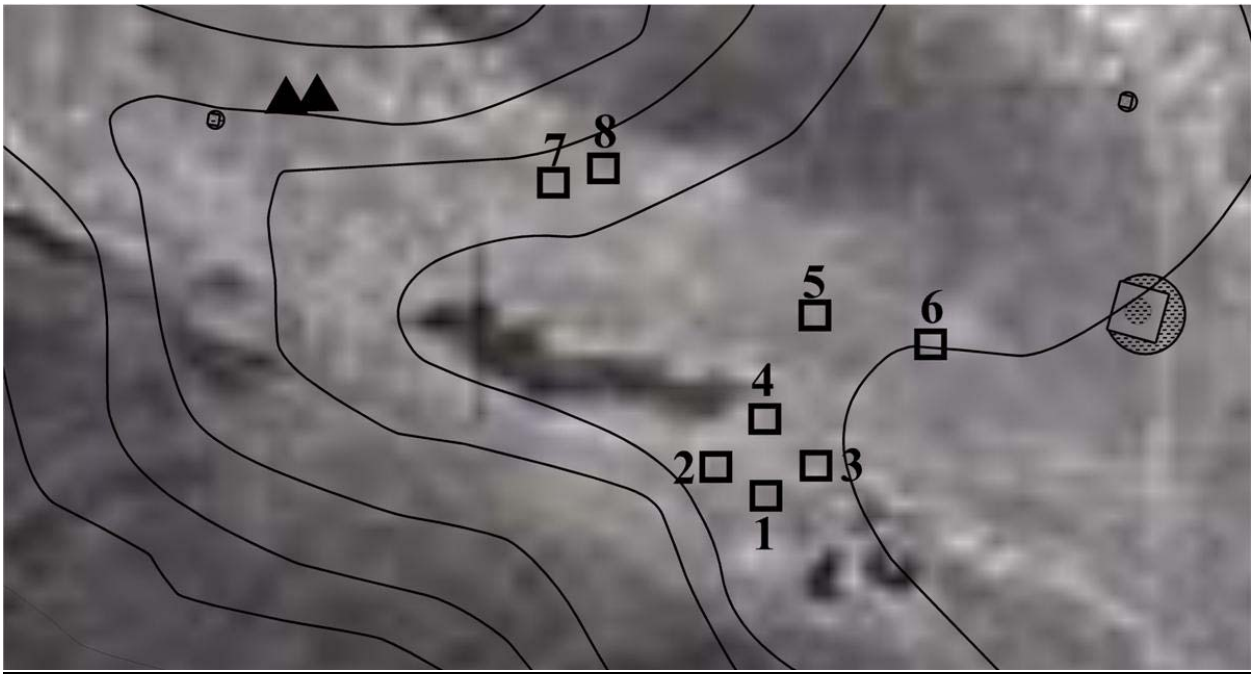

Figure 4.7 Location of excavation units at SP31E-QUE
(units not to scale – refer to Figure 4.2).

SP27E-MTC

GPS Coordinates: 48°05’28” N 101°05’00” E (Zone 47U N: 5328526 N 655129 E)

Site Context: Mixed Bronze Age and Iron Age/Xiongnu

This occupation area is located within 100 m of the Khanuy River and is situated at the exact same place as a modern summertime campsite. The terrain on which the occupation area lies is flat and is also characterized by grass and feather grass-like vegetation. The extent of this occupation area is less than 1 ha in area. There are no burials associated with this site. One campsite is usually set up here during the summer months.

Six strategically placed 2 m x 2 m units and two arbitrarily placed 2 m x 2 m units were excavated here (Figure 4.8). The maximum depth of excavations was about 15 cm, with most of the artifacts found between 5 and 10 cm below the surface.

Of a total of only 29 sherds belonging to both the Late Bronze Age and Iron Age Xiongnu periods, 9 were Late Bronze Age. Sheep/goat and a few horse remains were also recovered from the Late Bronze Age component of this site (see Chapter 5). This is also one of only two occupation areas where bones from wild species were discovered. This consisted in a single bone fragment belonging to musk deer (*Moschus moschiferus*).

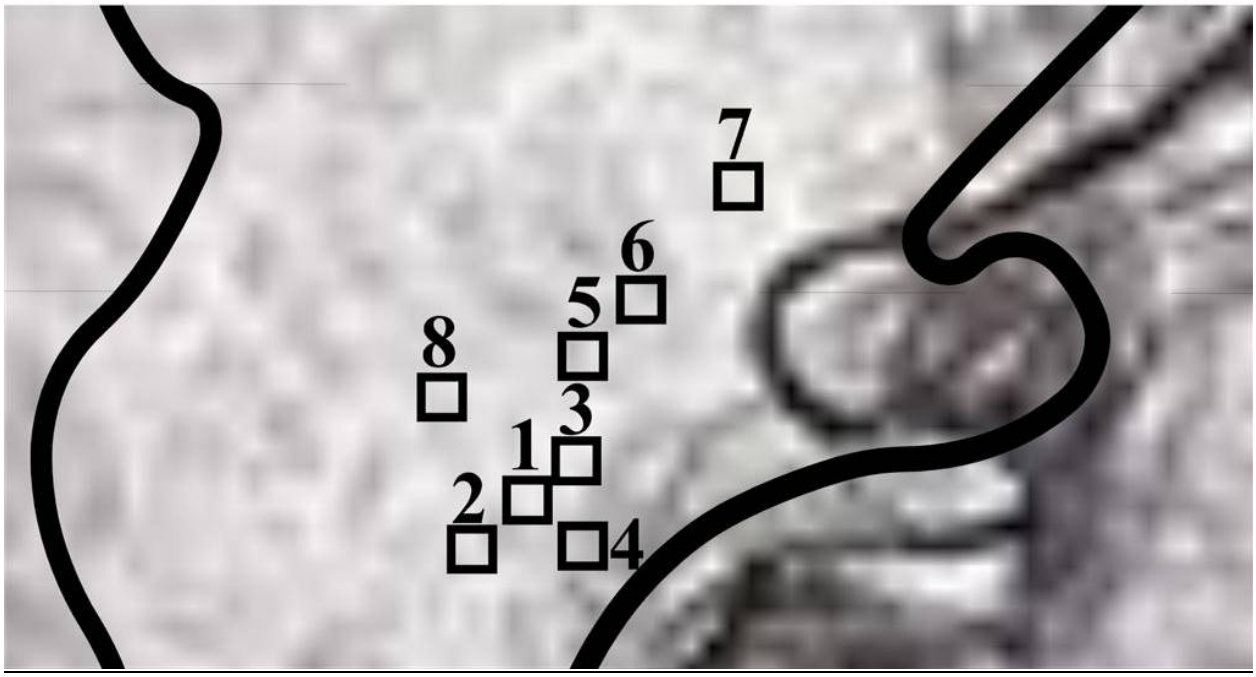

Figure 4.8 Location of excavation units at SP27E-MTC
units not to scale – refer to Figure 4.2).

SP32E-MAB

GPS Coordinates: 48°04'37" N 101°04'55" E (Zone 47U N: 5326949 N 655069 E)

Site Context: Mixed Bronze Age and Iron Age/Xiongnu

This occupation area is located within 200 m of the Khanuy River channel and is also situated exactly at the same place as a modern-day summer campsite. The terrain is mostly flat except close to the floodplain, and the area is characterized by grassy vegetation. The extent of this occupation area is also less than 1 ha in area. Once again, no burials are associated with this occupation area. Today, one campsite usually sets up here during the summer.

Six strategically placed 2 m x 2 m units and two arbitrarily placed 2 m x 2 m units were excavated here (Figure 4.9). The maximum depth of excavations varied between 10 cm and 15 cm, with only one unit reaching 30 cm in depth. Most of the artifacts were found between 5 cm and 10 cm below the surface, with only occasional finds around 15 cm.

This occupation area turned out to be one of the richest in terms of material remains. Excavations at this site yielded 232 sherds, 111 of which were Late Bronze Age. It also yielded a large amount of charcoal (>240 g), as well as faunal remains belonging to sheep/goat and horse. The site also revealed a bronze arrowhead, the only one discovered thus far in the research area.

Flotation samples from two promising contexts were also taken at this site. The first sample came from unit SP32E-MAB-9, an additional unit that was excavated in order to further investigate the eastern section of unit SP32E-MAB-1 where part of a possible hearth feature or refuse area was partially uncovered (Figure 4.10). The feature itself consisted of grouped stones, a large amount of charcoal (>240 g) and burnt bones. Soil from the second context came from a 'featureless' unit, but where a fair amount of charcoal, burnt bone, ceramics and slag was uncovered. The results of the botanical analysis will be discussed in detail in Chapter 5.

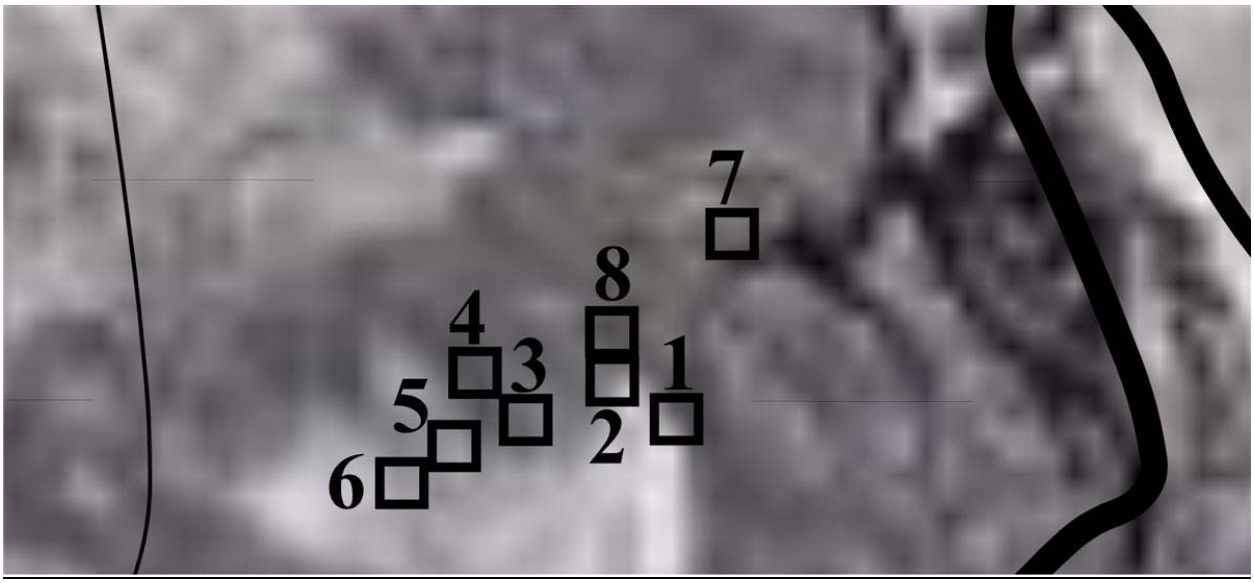

Figure 4.9 Location of excavation units at SP32E-MAB
(units not to scale – refer to Figure 4.2).

Figure 4.10 Part of a possible hearth feature within which flotation samples were taken.

SP32E-SHA

GPS Coordinates: 48°04’26” N 101°04’50” E (Zone 47U N: 5326606 N 654974 E)

Site Context: Mixed Bronze Age and Iron Age/Xiongnu.

Similar to the latter two sites and to contemporary summer campsites in this area, this occupation area is also situated some 100 m away from the Khanuy River. Here too the terrain is mostly flat except close to the floodplain, and the area is also characterized by grassy vegetation. The extent of this occupation area is also less than 1 ha in area. As is the case for other occupation areas along the river, no burials are associated with this site. During the summer months, one fairly large campsite is presently set up here.

Six strategically placed 2 m x 2 m units and two arbitrarily placed 2 m x 2 m units were excavated here as well (Figure 4.11). The maximum depth of excavations varied between 20 cm and 25 cm, but most of the artifacts were found between 10 cm and 15 cm below the surface, with only occasional finds in shallower and deeper deposits.

The ceramic content of this occupation area consisted of 40 Late Bronze Age sherds out of a total of 159 Late Bronze Age and Iron Age Xiongnu sherds. Sheep, goat and large mammal bones probably belonging to either horse or cattle were discovered here. This is also the only other site in the research area besides SP27E-MTC to have produced bones of wild species. Two bone fragments have been identified as belonging to musk deer (*Moschus moschiferus*).

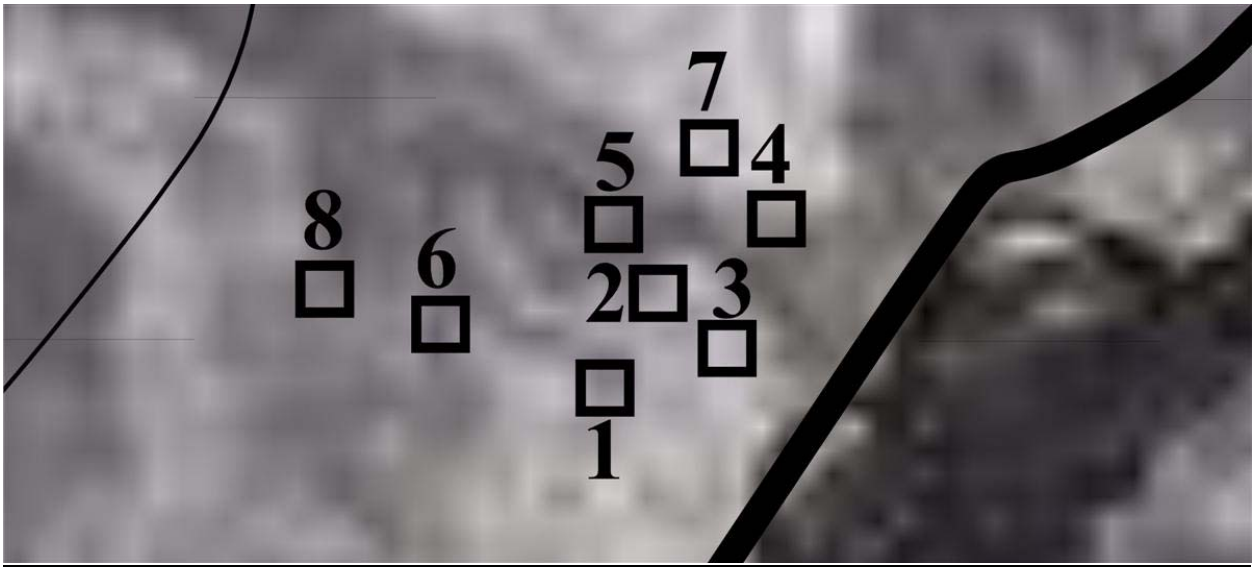

Figure 4.11 Location of excavation units at SP32E-SHA
(units not to scale – refer to Figure 4.2).

4.3.2 ZONE B

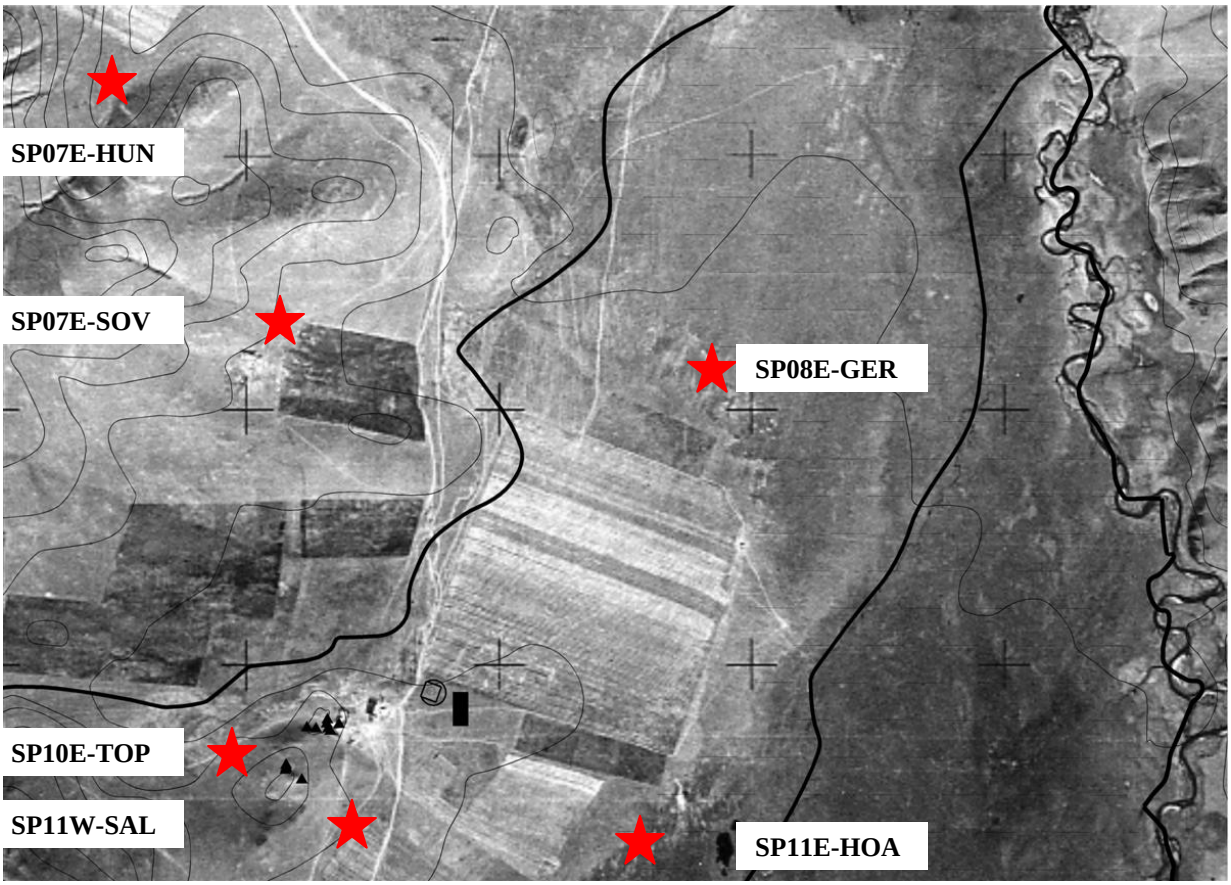

Figure 4.12 Location of occupation areas excavated in Zone B.

SP07E-HUN

GPS Coordinates: 48°11'54" N 101°04'15" E (Zone 47U N: 5340418 N 653878 E)

Site Context: Mixed Bronze Age and Iron Age/Xiongnu.

This occupation area is located within a fairly narrow but relatively deep valley draw that opens onto a tributary valley to its north (that tributary river is now dry). The site is located on a slight to moderate sloping terrain with, nonetheless, a fairly flat relief and little to no vegetation other than grass. The extent of this occupation area is about 2.3 ha in area and there are no burials located within or near it. One campsite presently occupies this area during the winter months.

Four strategically placed 2 m x 2 m units and four arbitrarily placed 2 m x 2 m units were excavated here (Figure 4.13). The average maximum depth of excavations was about 20 cm, but two units (#4 and #2) respectively reached 25 cm and 30 cm in depth. Most of the artifacts, nevertheless, were found between 10 cm and 15 cm below the surface.

The ceramic content of this occupation area consisted of 27 Late Bronze Age ceramic sherds out of a total of 69 Late Bronze Age and Iron Age Xiongnu sherds. Very few faunal remains could be uniquely associated with Late Bronze Age contexts, and these remains were too fragmentary to identify them beyond the class 'mammal'. However, the mixed Bronze Age and Iron Age contexts at this site revealed the full range of domesticated animals found at other sites in the research area.

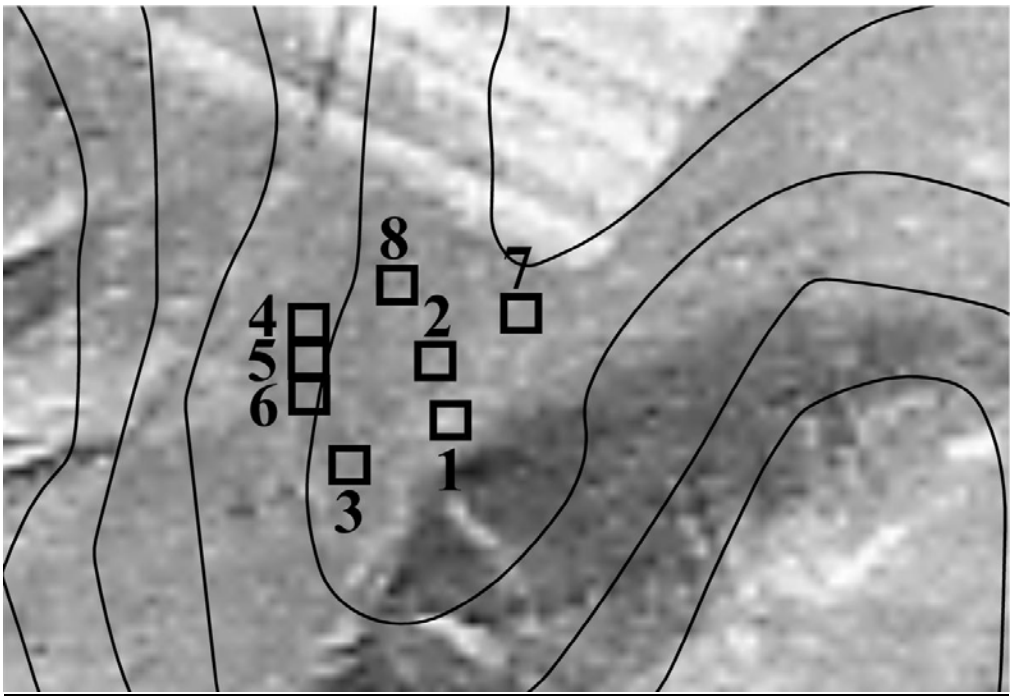

Figure 4.13 Location of excavation units at SP07E-HUN
(units not to scale – refer to Figure 4.12).

SP07E-SOV

GPS Coordinates: 48°11’16” N 101°04’48” E (Zone 47U N: 5339263 N 654591 E)

Site Context: Mixed Bronze Age and Iron Age/Xiongnu (But mostly Bronze Age).

This occupation area is located within a large and fairly flat valley draw that opens up toward the east. As in all the other cases, there is little to no vegetation other than grass here. The extent of this occupation area is about 4.9 ha in area. Despite the fairly large size of this draw, today it only shelters one winter campsite (with many structures), but it certainly has the potential of accommodating one or two others. In terms of setting and shelter it provides, this valley draw is the one in Zone B that most resembles those in Zone A. Contrary to Zone A, however, there are no burials located within or near this valley draw.

Seven strategically placed 2 m x 2 m units and one arbitrarily placed 2 m x 2 m units were excavated here (Figure 4.14). The maximum depth of excavations varied between 10 cm and 20 cm, with the exception of one unit (#1) which reached 40 cm in depth. Most of the artifacts were found between 5 cm and 15 cm below the surface, with only unit #1 also revealing artifacts at depths of some 25-30 cm below the surface. This is probably due to rodent activity as a rodent run and remains of vole (*Clethrionomys*) were identified in this unit around 20 cm below the surface.

The ceramic content of this occupation area consisted of 133 Late Bronze Age ceramic sherds out of a total of 187 Late Bronze Age and Iron Age Xiongnu sherds. Interestingly, while the ceramic assemblage is comparatively rich and diverse, the faunal remains were extremely poor and mostly unidentifiable. The implications of this will be discussed in Chapter 6.

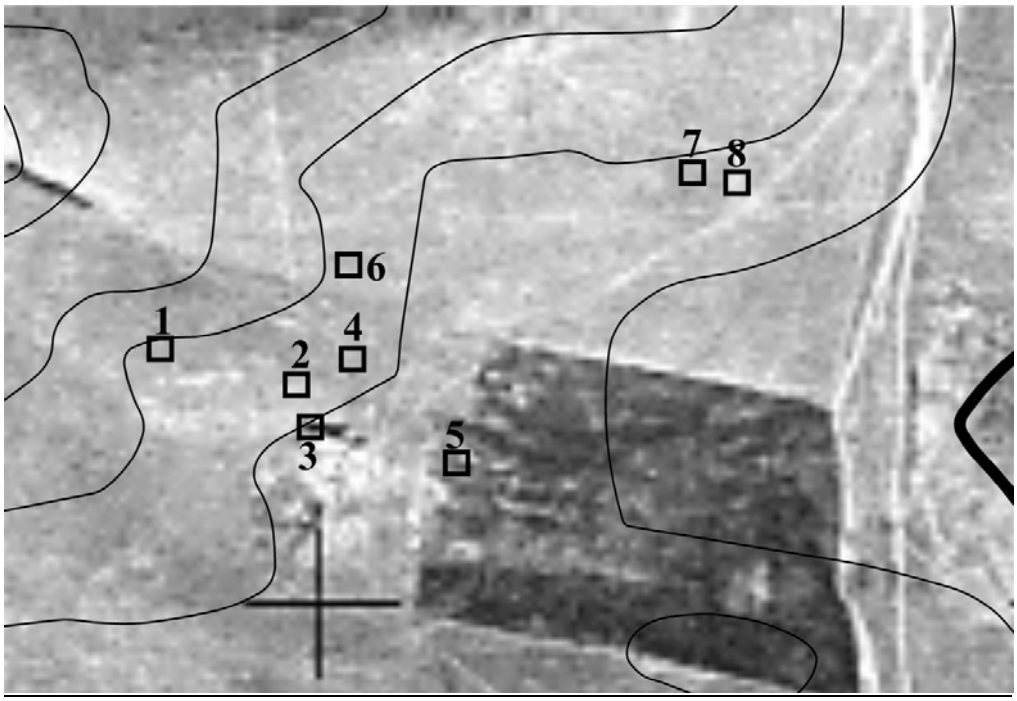

Figure 4.14 Location of excavation units at SP07E-SOV
(units not to scale – refer to Figure 4.12).

SP10E-TOP

GPS Coordinates: 48°10’17” N 101°04’18” E (Zone 47U N: 5337425 N 654020 E)

Site Context: Mixed Bronze Age and Iron Age/Xiongnu

This occupation area is one of only two occupation areas in this zone that are located near ‘slope’ burials (n=11). The occupation area is located within a wide draw that opens onto a tributary valley to its north (that tributary river is now dry). Vegetation consists of grass. The extent of this occupation area is about 7.4 ha in area. There is presently no evidence of recent occupation.

Six strategically placed 2 m x 2 m units and two arbitrarily placed 2 m x 2 m units were excavated here as well (Figure 4.15). The maximum depth of excavations was about 15 cm, but most of the artifacts were found between 5 cm and 10 cm below the surface.

Although this occupation area revealed a fairly large amount of ceramics, only 13 of the 145 ceramic sherds were Late Bronze Age. All the others were Iron Age Xiongnu period sherds. Like all the others in Zone B, this occupation area yielded very few and highly fragmentary faunal remains. Both sheep/goat and horse were nonetheless identified.

Figure 4.15 Location of excavation units at SP10E-TOP
(units not to scale – refer to Figure 4.12).

SP11W-SAL

GPS Coordinates: 48°10'06" N 101°05'10" E (Zone 47U N: 5337114 N 655103 E)

Site Context: Mixed Bronze Age and Iron Age/Xiongnu.

This occupation area is located the closest to both a *khirigsuur* and a major deer stone site, as well as to the same eleven 'slope' burials that are associated with SP10E-TOP above (see Figure 2.4). It is situated in what can hardly be called a draw, although it is protected by low-elevation hills on its western and northern flanks. A slight east trending slope characterizes the terrain, with little to no vegetation other than grass. The extent of this occupation area is about 6.7 ha in area. There is no evidence of recent occupation at this site location. Nevertheless, a fairly large contemporary winter campsite is presently located a few hundred meters north of this prehistoric occupation area.

Six strategically placed 2 m x 2 m units and two arbitrarily placed 2 m x 2 m units were excavated here as well (Figure 4.16). The maximum depth of excavations varied between 15 cm and 20 cm, with most of the artifacts found between 5 cm and 15 cm below the surface.

The ceramic content of this occupation area consisted of 32 Late Bronze Age ceramic sherds out of a total of 66 Late Bronze Age and Iron Age Xiongnu sherds. Very few faunal remains were found in general here, but this occupation area revealed the largest number of stone artifacts in the whole research area. The details of the lithic assemblage and the implications of this will be discussed in Chapter 6.

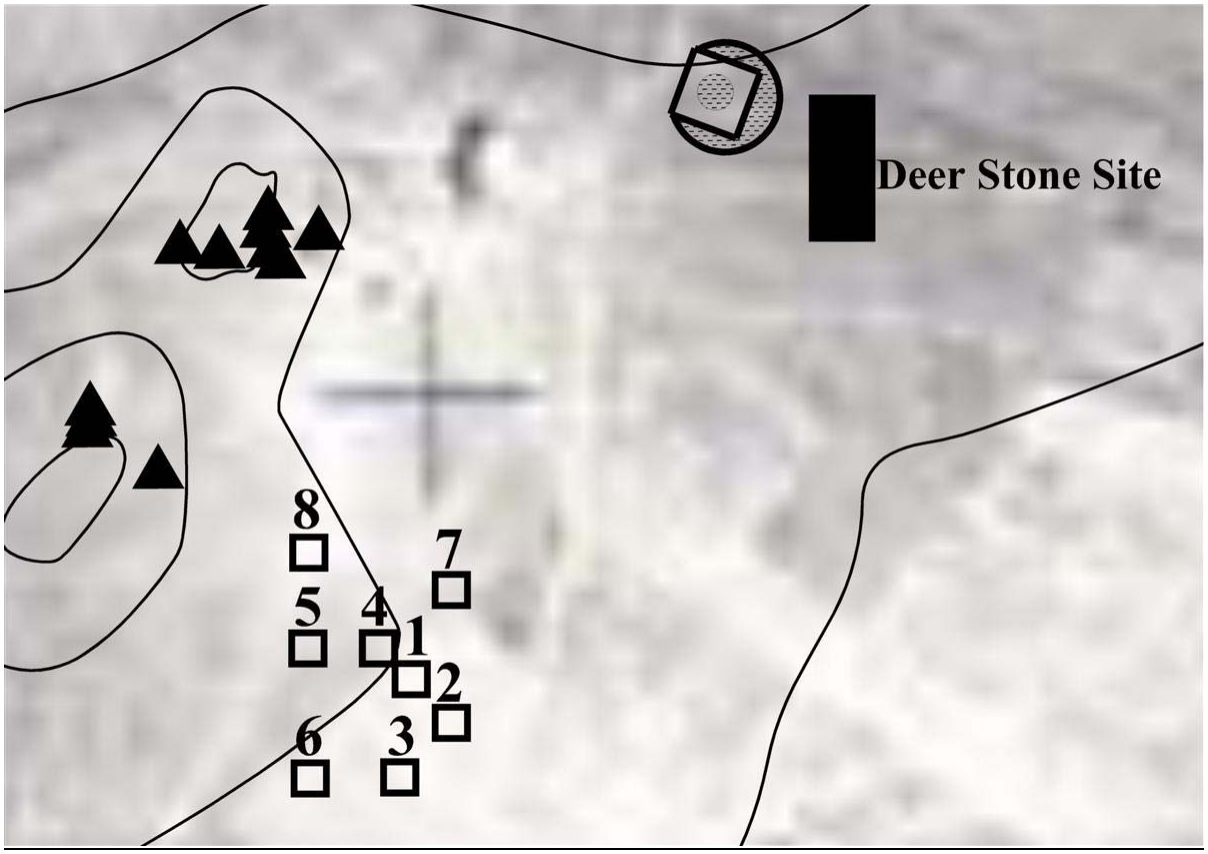

Figure 4.16 Location of excavation units at SP11W-SAL
(units not to scale – refer to Figure 4.12).

SP08E-GER

GPS Coordinates: 48°11’02” N 101°06’27” E (Zone 47U N: 5338886 N 656646 E)

Site Context: Mixed Bronze Age and Iron Age/Xiongnu

This occupation area is one of only two sites investigated along the floodplain in Zone B. Due to the fact that a present-day summer campsite was set up exactly over this prehistoric occupation area at the time we were going to excavate, excavation units needed to be moved several tens of meters southeast and northwest of the center of the actual site discovered in 2007. The terrain in this area is flat and is also characterized by grass vegetation. The extent of this occupation area is about 0.2 ha in area. There are no burials associated with this site. Today only one camp is set up here during the summer.

Seven semi-strategically placed 2 m x 2 m units were excavated here. That is, all were excavated several meters (ca. 10 m) away from the original positive shovel probes (Figure 4.17). The maximum depth of excavations was about 15 cm, with most of the artifacts found between 5 cm and 10 cm below the surface.

The ceramic content of this occupation area consisted of only 5 Late Bronze Age ceramic sherds out of a total of 17 Late Bronze Age and Iron Age Xiongnu sherds. This may indeed be due to the alternative placement of excavation units, but sherds discovered on the surface did confirm that this was mostly an Iron Age Xiongnu site. Once again, total faunal remains were extremely few and highly fragmented at this site, and none were found in Late Bronze Age contexts only.

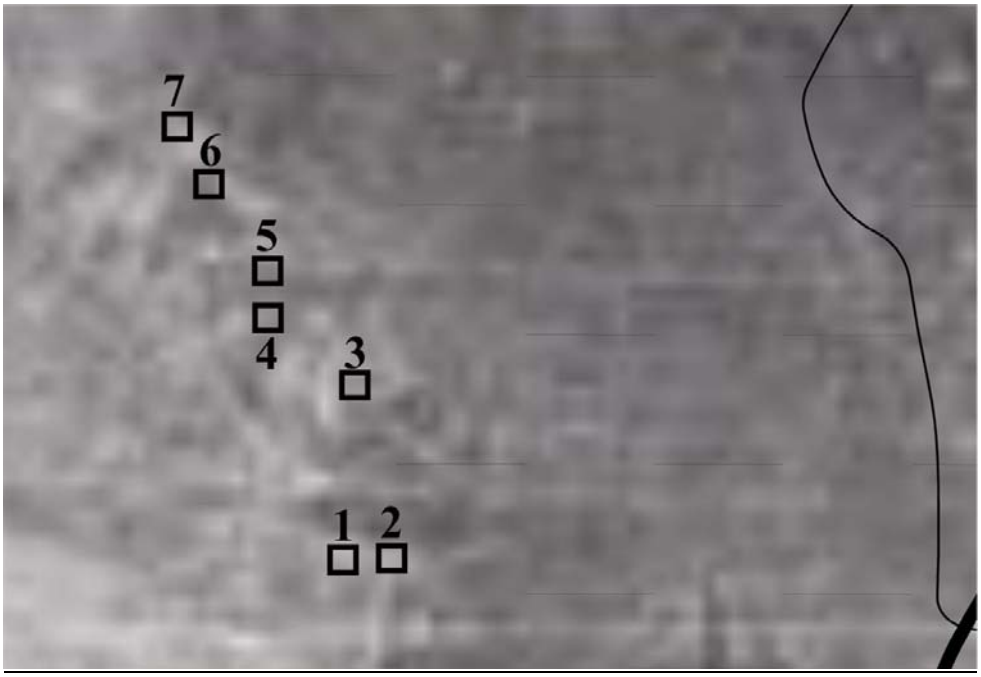

Figure 4.17 Location of excavation units at SP08E-GER
(units not to scale – refer to Figure 4.12).

SP11E-HOA

GPS Coordinates: 48°10'10" N 101°06'05" E (Zone 47U N: 5337268 N 656236 E)

Site Context: Mostly Iron Age/Xiongnu (a bit of Turk and one single rich Bronze Age unit).

This is the only other occupation area investigated along the floodplain in Zone B. The terrain is flat and is characterized by grassy vegetation. The extent of this occupation area is about 1.7 ha in area. There are no burials associated with this site. Presently one to two camps are set up here during the summer.

Five strategically placed 2 m x 2 m units and three arbitrarily placed 2 m x 2 m units were excavated here as well (Figure 4.18). The maximum depth of excavations was about 10 cm, with most of the artifacts found between 5 cm and 10 cm below the surface.

The ceramic content of this occupation area consisted of 79 Late Bronze Age ceramic sherds (from one single unit [#2]) out of a total of 123 Late Bronze Age and Iron Age Xiongnu sherds. Faunal remains were not found in great quantity, yet sheep and horse were identified in Late Bronze Age contexts.

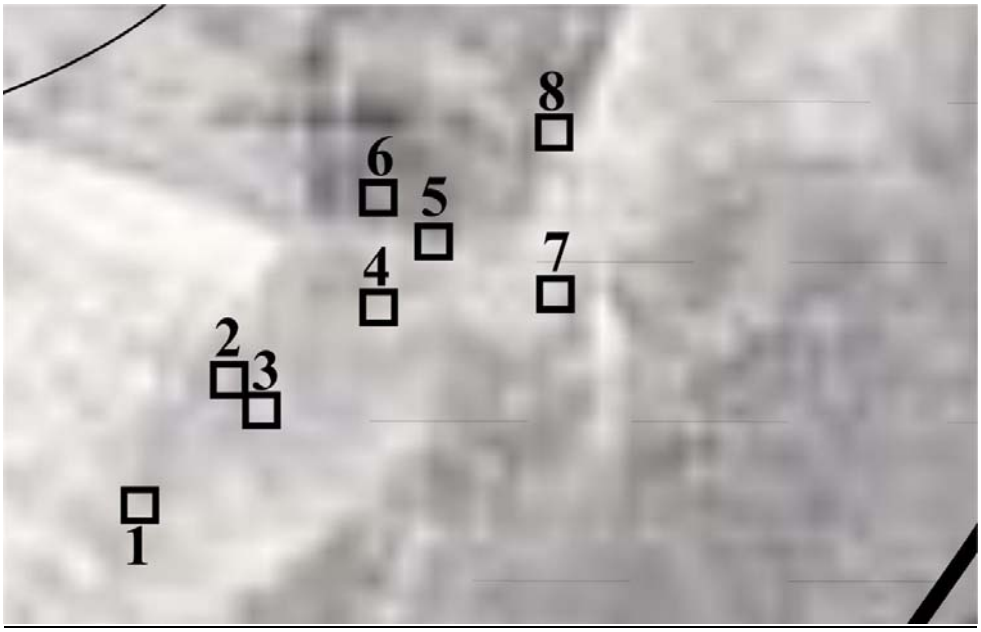

Figure 4.18 Location of excavation units at SP11E-HOA
(units not to scale – refer to Figure 4.12).

4.4 SUMMARY

A total of 14 occupation areas have been further investigated through test excavations. These excavations have produced a sample of artifacts and faunal remains from each of these domestic areas which now allows for the comparison of activities between these different occupation areas. The comparison and analysis of these domestic occupations will be taken up in the following chapters.

5.0 SUBSISTENCE, SEASONALITY AND MOBILITY

Past assessments of subsistence economy in the prehistoric Eurasian Steppes have recently been the subject matter of many critiques (Frachetti 2004; Hanks 2003; Morales-Muniz and Antipina 2003; Rassamakin 1999). The problems, they argue, are both methodological and theoretical. Methodologically, the problem apparently lies in the lack of appropriately recovered and analyzed botanical and faunal data. Soviet and post-Soviet excavations, for example, have not systematically collected paleobotanical data, and the lack of systematic screening and an almost absence of flotation has resulted in an underrepresentation of plant remains, small mammals, birds and fish. Theoretically, the problem lies in part with "the misuse of ethnographic observations for associating particular faunal assemblages with prescribed socio-economic strategies (i.e. pastoral nomadism, sedentary agro-pastoralism, etc.)" (Frachetti 2004:239). Michael Frachetti (2004:240) has also recently further underscored where the problem lies with most economic reconstructions of the subsistence economy proposed notably during the Soviet period, that is, that they have for the most part rested almost solely on faunal findings from excavated burials. Apparently, this problem has specifically to do with the paucity of settlement data within the steppe zone (Hanks 2003:72), but recent collaborative studies (e.g. Anthony et al. 2005; Chang et al. 2002; Frachetti 2004; Hanks 2003; this study) indicate that this paucity of data from habitation sites is not because of their actual absence, but because of the lack of appropriate techniques (or resolve) to uncover them.

This problem has also plagued the reconstruction of ancient subsistence economies in Mongolia. Indeed, at present, subsistence reconstructions for Bronze Age Mongolia still rest almost solely on animal remains found in burial and ritual contexts (e.g. Tsybiktarov 1998:147-149, 2003:82-83) and we lack the more concrete evidence of subsistence practices that come from residential contexts. This, in part, has led some to suggest that Late Bronze Age groups associated with *khirigsuurs* were either necessarily pastoralists (of an uncertain nature) or, contrary to the general view, Epipaleolithic (Mesolithic) hunter-gatherers (Wright 2006). To be fair, however, these last two authors (Tsybiktarov and Wright) call for the necessity of conducting archaeological research on domestic contexts. Nevertheless, for the moment, what is known of the actual subsistence economy of Late Bronze Age Mongolia is, not surprisingly, very little. But this is to be expected of a type of archaeology that has been mainly interested in burials, ritual sites and objects of fine craftsmanship. Botanical remains and animal bones have not been given the same attention—especially those from domestic contexts. As a result, interpretations regarding the nature of Late Bronze Age subsistence practices has to date remained speculative.

The results presented in this study are the first step in reconstructing the subsistence economy of Late Bronze Age occupation areas (habitation sites) in Mongolia. The objective is to understand the everyday subsistence economy. And the fact that this study sampled a variety of occupation areas in different places within the research area renders the evaluation of the overall subsistence practices fairly reliable. That is, as discussed earlier, the more extensive sampling procedure used in this study, while sacrificing some detail, at least assures a greater likelihood that the sample is representative of the region during this period of time. The fullest possible retrieval of information related to subsistence economy was thus essential for interpreting the

nature of Late Bronze Age occupation areas. Given the limited time and resources of this particular study, however, it was not possible to explore the complete range of methodological approaches to subsistence practices (see for example Shahack-Gross and Finkelstein 2008), yet the analyses of the material remains recovered from the various excavated occupation areas (artifacts, faunal remains and macrobotanical remains retrieved through flotation) provide to date the most complete and the only comprehensive assemblages from non-mortuary contexts for this period in Mongolia. This study thus provides, for the first time, quantitative and appropriate evidence relating to the subsistence practices of Late Bronze Age inhabitants in Mongolia's Khanuy Valley.

To be sure, the sample of material from occupation contexts produced by this study is very small. But this was somewhat expected given the sampling procedure and the probable pastoralist nature of these societies. This should not, however, prevent us from identifying clearly the patterns to be found in it or from exploring fully the implications of those patterns. For this reason, it is also essential to assess the risk that those patterns emerge only because of the random processes at work in a small sample, and this is properly undertaken as a separate task from identifying patterns—a task for which statistics provides us with powerful tools.

5.1 BOTANICAL REMAINS

No artifactual evidence—specifically stone tools—for plant cultivation or processing has been uncovered in any of the excavated contexts. In fact, an extremely low number of stone artifacts have been found in general, and even fewer from secure Late Bronze Age contexts. The total Late Bronze Age lithic assemblage actually consisted of only nine unretouched small flakes (< 3

cm in width) and a whetstone. None of these can be related to tools that could have been used to cultivate or process plants or grains. Artifactual evidence, therefore, does not suggest that plants were being cultivated or processed in this region during Mongolia's Late Bronze Age. Nevertheless, not all plants, especially wild species, require special tools to harvest or process them.

In order to further investigate the possibility of plant use, therefore, flotation samples from four promising contexts were taken at two different occupation areas, one located in the foothills and taken to be a winter campsite (SP26E-MAC) and another located along the Khanuy River, which is taken to be a summer campsite (SP32E-MAB) (see Figure 4.2 in Chapter 4). The method used to process sediment samples was a simple manual bucket flotation method. After gently disaggregating the sediment and then creating a vortex by swirling the water by hand, light fractions were collected from the float with a handheld 1 mm sieve, while heavy fractions were recovered in a 3 mm mesh screen. Samples removed from the float were then placed in cheesecloth, labeled and hung for drying. The heavy fractions did not contain any plant remains, so only light fractions were examined. These light fraction samples were analyzed by Dr. Zhao Zhijun in the laboratory of the Institute of Archaeology (CASS), Beijing, China.

The first two samples that were analyzed came from two different excavation units at the SP32E-MAB occupation area. This occupation area is located within 200 m of the Khanuy River channel and is still occupied today by modern herders during the summer. The first sample comes from SP32E-MAB-9, an additional unit that was excavated in order to further investigate the eastern section of unit SP32E-MAB-1 where a possible hearth feature was partially uncovered (see Figure 4.10 in Chapter 4). The actual sediment sample for flotation came from the feature itself, which consisted in grouped stones, a large amount of charcoal (>240 g), as well

as burnt and calcined bones—all of which reinforced the idea that this was a hearth feature. A total of 21 liters of soil was taken between 5 and 15 cm below ground surface (the cultural layer). The flotation sample recovered from this soil yielded a few tiny unidentified land snails (n=3), abundant modern rootlets, a large amount of wood charcoal identified as belonging to four species (Larch, Pine, Birch, Poplar) (Wang and Wang 2009), as well as 30 *Chenopodium* seeds (also known as goosefoot) and 1 Cyperaceae seed. The types of tree species identified in the charcoal remains are consistent with contemporary ones in the research area. In addition, both *Chenopodium* and Cyperaceae are very common taxa in the steppe environment and are still prevalent in the research area. Together, the presence of these plant remains confirms the data presented in Chapter 1 that suggest that Late Bronze Age environmental conditions were similar to those of today.

Soil from another context (SP32E-MAB-10) within the same occupation area was also floated. This sample came from a 'featureless' unit, but where some charcoal and burnt bone were also uncovered. Here, a total of 10.5 liters of soil was taken between 5 and 15 cm below ground surface (the cultural layer). Only 1 *Chenopodium* seed and 1 Cyperaceae seed were recovered from this context.

The other two samples that were analyzed came from two different excavation units at the SP32E-MAC occupation area. This occupation area, situated along the western foothills, was briefly discussed in Chapter 3 since, according to present-day local herders, it is not located in a particularly good setting. Nonetheless, it is located in the part of the valley that is contemporarily used during the winter months.

Despite its odd location, it was decided to float some soil from this occupation area because it had been reported that *Chenopodium* seeds had been discovered there in 2004 by a

student researching agropastoralism in East Asia. The seeds in question came from a circular burnt soil feature with a fair amount of charcoal, burnt bone, and ceramics belonging to both the Bronze Age and the Xiongnu period. Unfortunately, detailed results were never reported, the student abandoned her studies and the location of the samples is unknown. Although the original feature was no more, soil for flotation was collected from an adjacent 50x50 cm unit (SP26E-MAC-8) in the hopes of recovering plant remains that may have been associated with the original feature. A total of 7 liters of soil was taken between 5 and 15 cm below ground surface (the cultural layer). Nine *Chenopodium* seeds were recovered. No other plant remains besides modern rootlets were identified.

Soil from another unit at this occupation area was also floated (SP26E-MAC-9). The sample came from a 'featureless' unit, but where a fair amount of charcoal, burnt bone, ceramics (both Bronze Age and Iron Age) and metallurgic slag was uncovered. A total of 10.5 liters of soil was taken between 5 and 15 cm below ground surface (the cultural layer). No plant remains besides abundant modern rootlets were identified.

The recovered paleobotanical remains from the two occupation areas, then, consist of 40 *Chenopodium* seeds and 2 Cyperaceae seeds. None of the cultigens (i.e. millet, wheat and barley) found in subsequent Iron Age Xiongnu period domestic contexts in neighboring regions (Davydova 1995; Wright et al. 2009) have been found here. Cyperaceae, a weedy plant still present in the research area, was only found at SP32E-MAB, which is consistent with its nearby marshy floodplain location. *Chenopodium* seeds were recovered in similar quantities from both tested occupation areas (Table 5.1). As mentioned above, this is also a very common taxon in steppe environments and it is still prevalent in the research area. Accordingly, together with the fact that there is no history of cultivation here, it is very likely that these two taxa were not

domesticated or cultivated. However, the presence of wild *Chenopodium* seeds in burnt assemblages is very interesting. For one, seeds of *Chenopodium* are very nutritious. In China, they have been found in archaeological contexts that date back to the Late Longshan Period (ca. 2600-2000 BCE) and they are still used in China today as a source of greens and starchy grain (Lee et al. 2007). In Mongolia, charred *Chenopodium* seeds have been found in Iron Age/Xiongnu settlement contexts in Egiin Gol, a region just north of the Khanuy Valley (Wright et al. 2009:381) and at the Medieval period site of Karakorum, the capital city of the Mongolian Empire (Rösch et al. 2005). It is possible, therefore, that just as was the case in the northern steppe east of the Don during the Late Bronze Age (Anthony 2007:439; Popova 2006), these wild seed-bearing plants could have also been collected in the wild as early as the Late Bronze Age in Mongolia. In any case, groups in this region were apparently not farmers, but possibly harvested local wild grains.

Further support for the idea that plant cultivation was not an important item for the Late Bronze Age inhabitants of the Khanuy Valley is related to the size of the samples. Indeed, we can be 87% confident that a sample of 40 seeds including no domesticated plants comes from a population with less than 5% domesticated plants. The sampling situation is a bit more complicated here than a simple random sample of 40 seeds, but the fact that they come from three contexts in two locations where well preserved botanical remains were recovered makes it even more likely that we would have found domesticated specimens if they were at all abundant.

In regard to how important plant collecting was to Late Bronze Age subsistence is more complicated to assess. Certainly, the complete absence of grinding stones, pestles and other such tools from all of the archaeological assemblages in the Khanuy Valley research area does provide a line of evidence that plant processing (wild or cultivated) may not have been very important.

Of course, many wild plants and berries still collected in the region do not necessitate any special tools to harvest or process them. However, no other macrobotanical evidence was found for wild edible plants. Furthermore, if compared to other Bronze Age sites in the Eurasian Steppes where relatively large quantities of *Chenopodium* seeds (n= >15 / liter of soil) were discovered in pastoral contexts (Popova 2006), the quantities found in the Khanuy Valley are negligible and thus probably did not account for much of the diet (Table 5.1). This is not to say that wild plants and berries were not exploited—in fact this is highly probable—but beyond the possibility that Late Bronze Age groups in the Khanuy Valley exploited at least somewhat wild grains such as *Chenopodium*, we still have a poor sense of what kind of wild plants were used on a regular basis. This may only be due to the very limited macrobotanical analysis carried out to date, however. Phytolith analysis in the future might eventually find further evidence of edible wild plants within domestic contexts.

Table 5.1 Number and density of seeds per plant taxa recovered from flotation samples in the Khanuy Valley research area.

	SP32E-MAB-9	**SP32E-MAB-10**	**SP26E-MAC-8**	**SP26E-MAC-9**
Chenopodium	30	1	9	0
Cyperaceae	1	1	0	0
Soil (liters)	21	10.5	7	10.5
Density (*Chenopodium*)	1.43	0.09	1.29	0
Density (Cyperaceae)	0.04	0.09	0	0

5.2 FAUNAL REMAINS

Perhaps not surprisingly, faunal remains (Total NISP = 3511) constitute the majority of the Late Bronze Age archaeological material recovered from the various occupation areas. While this is not surprising, their location in domestic contexts renders them especially important for answering a number of the research questions discussed in Chapter 1, not the least to better characterize the previously ill-examined subsistence patterns and animal exploitation during Mongolia's Late Bronze Age, but also for helping to determine seasonality of occupation areas.

Although the overall sample size is very small and should be considered as a preliminary, tentative evaluation of the Late Bronze Age economy in this region, the faunal material presented here represents to date the only fauna recovered from non-mortuary contexts for this period in Mongolia. In addition to evaluating the overall use of faunal resources in subsistence, the relative representation of domestic to wild species and seasonality of occupation areas, these faunal remains were also used for determining herd *composition* (not its *structure*). In this study I distinguish between '*herd composition*' (the types of animals herded and relative species representation), and '*herd structure*' (the nature of the herd and related management practices, including the nature of animal exploitation and principal products for which the animals were reared). The analysis of faunal remains included general element and species identification, mortality profiles (when possible), as well as taphonomic studies of bone surface modification and treatment (e.g. cut marks, fracture patterns, charring-burning, etc.). As stated before, everything was systematically screened through 6 mm wire mesh and occasionally through 3 mm wire mesh to verify that bones of small mammals, birds or fish were not missed.

5.2.1 Analysis of the Faunal Remains

All faunal remains were cleaned, sorted, and recorded in the field prior to analysis. Each specimen was then identified to the lowest taxonomic level possible and the whole assemblage analyzed independently by two zooarchaeologists, Sarah M. Viner (University of Sheffield) and Cheryl Makarewicz (Stanford University). For identification purposes, extensive use was also made of a comparative skeletal collection of local domestic animals that this project assembled during the 2007 field season. Measurements were taken to the nearest millimeter according to von den Dreisch (1976). Whenever possible, the approximate age and the sex of the animals were recorded as well.

5.2.2 Species Identification

Identification of sheep (*Ovis*) and goat (*Capra*) long bones and teeth is based on morphological criteria established by Boessneck et al. (1964), Payne (1985) and Halstead et al. (2002). In most cases, however, the bones of these two species could not be distinguished. When this is the case, the term 'sheep/goat' is used. In addition, despite various quantitative analyses of the metric data, it was not possible to identify the bovid and equid material to the species level (Sarah Viner, personal communication; Sandra Olsen, personal communication), so the genera *Bos* (cattle) and *Equus* (horse) are used.

Save for one undiagnostic eggshell fragment, no non-mammalian species were encountered. Therefore, fragments of bones from unidentifiable mammalian species were either categorized by size as '*large mammal*' (cattle and horse size animals), '*medium mammal*' (sheep, goat, and gazelle size animals), and '*small mammal*' (rodent size animals); or just as '*mammal*' when these size distinctions could not be made. Of course, these size categories are by no means

discrete ones and we do acknowledge a degree of unavoidable error in the classification of these unidentified remains. Small mammal bones probably originate from vole (*Clethrionomys*) or pika (*Ochotona*), but were impossible to identify more definitely without more extensive reference material. They are unlikely to have formed a major part of the prehistoric diet and none of the remains exhibited cut marks. Species of *Clethrionomys* and *Ochotona* are extant in the research area today, and are most likely intrusive to the archaeological contexts in any event. They will not be discussed in greater detail at present.

5.2.3 Mortality Profiles and Seasonality

Despite the overall fragmentary nature of most of the assemblage, when possible information regarding both epiphyseal fusion and tooth eruption and attrition was recorded during analysis. Epiphyseal fusion schedules for sheep and goats are based on Zeder (2006) and for cattle, Silver (1969). Caprine and cattle tooth wear stages were recorded according to Payne (1973) and Grant (1982), respectively. The extent of fusion on postcranial bones was characterized as one of fused (no visible line between the epiphysis and diaphysis), unfused (the process of bone fusion had not yet commenced), or fusing (fusion had started but was not yet compete). In addition, those unfused elements in which both the epiphysis and diaphysis were present were recorded as 'ux'. Accordingly, bones were then separated into early, intermediate and late fusing elements following O'Connor (1988) (Table 5.2). Epiphyseal fusion rate can be affected by a variety of factors such as the sex of an animal, castration, environmental conditions and nutrition (Davis 1996; Reitz and Wing 1999:75). This data should therefore be considered to give an idea of the approximate age of animals (i.e. infant, immature, and adult) rather than an attempt to determine absolute age. Despite this, the data is useful for helping to provide general indicators of seasonality, which in turn can be compared with the local ethnographic record and thus further

help assess the degree of sedentariness. For example, seasonality can be determined, at least in relative terms, by evaluating relative age cohorts of species that have a restricted birthing season such as sheep and goats (e.g. Legge and Rowly-Conwy 1988:108). In the Khanuy Valley, like in most of Mongolia today, lambing occurs from late February to mid May. The presence of neonatal sheep/goats at a particular site would thus suggest late winter-spring occupations (Telenged 1996).

Table 5.2 The separation of bones into fusion stages (modified from O'Connor 1988).

Earliest	Early	Intermediate	Late
Pelvis	Distal humerus	Distal metacarpal	Proximal humerus
Scapula	Proximal radius	Distal metatarsal	Proximal femur
	Phalanx 1	Distal tibia	Proximal tibia
	Phalanx 2	Calcaneum	Distal radius
			Distal femur

5.2.4 Quantification

The number of individual specimens (NISP), a primary data set that is typically used to estimate the relative frequency of taxa represented in an assemblage, was calculated for each taxon. Since the overall objective of this faunal analysis is to understand the overall subsistence practices and the relative use of faunal remains in the Khanuy Valley during the Late Bronze Age, the calculation of minimum number of individuals (MNI) is not crucial. In fact, the small, highly fragmented, taphonomically filtered assemblages recovered from deposits that probably represent multiple depositional units most likely renders the calculations of MNI fairly unreliable in this case compared to NISP values (Marshall and Pilgram 1993). In addition, NISP values are probably a better measure here for quantifying and comparing the frequency of various species

from our probably highly scattered contexts than are MNI values. Furthermore, the analysis of the material suggests that taphonomic conditions were highly similar across all of the samples and thus renders comparisons of proportion of NISP between samples acceptable. Meaningful comparisons of the assemblages are thus still possible using measures of number of individual specimens (NISP) by taxonomic group.

Due in part to the relatively small samples per unit, data was summed up to provide a total NISP for each individual occupation area. This also helped to account for scattering effects due to natural, animal and/or human activity (something we observe today around herder campsites in the research area). In any event, a more intensive and site specific analysis of each discrete unit was not necessary since the objective of this study was not an analysis of the spatial organization of activities within occupations, but rather an analysis designed to deal with the spatial organization of activities at a larger regional scale. Finally, following the survey and excavation results, NISP values were further summed up according to the two major occupation zones where the remains were found (i.e. 'foothill' occupation area and 'riverside' occupation area) so as to provide an overall view of the domestic economy and in order to evaluate seasonality of campsite locations.

5.2.5 The Faunal Assemblage

A total of 3511 bone specimens were recovered from the fourteen excavated occupation areas in the Khanuy Valley. Unfortunately, most of the bones were recovered from mixed Bronze Age/Iron Age Xiongnu contexts. While this data will also be discussed to some extent, the following analyses will essentially cover bones that were recovered from stratigraphic contexts that yielded Bronze Age ceramics only and no ceramics from other periods. This consists in a total corpus of 679 diagnostic bones from eleven of the fourteen occupation areas (Table 5.3).

Table 5.3 Number of Identified Specimens (NISP) in Late Bronze Age contexts only according to occupation area.

SPECIES	ZONE A								ZONE B			TOTAL
	BMK	MAC	WFA	JUL	QUE	MTC	MAB	SHA	HUN	TOP	HOA	
Bos sp.	1	-	4	-	2	-	-	-	-	-	-	7
Bos/Equus	-	-	-	-	2	-	-	-	-	-	-	2
Equus sp.	1	-	2	-	2	2	5	-	-	2	1	15
Ovis/Capra	-	-	9	-	4	1	9	6	-	4	-	33
Capra sp.	-	-	1	-	-	-	-	6	-	-	-	7
Ovis sp.	-	-	2	-	-	-	-	2	-	-	1	5
Moschus sp.	-	-	-	-	-	1	-	2	-	-	-	3
Eggshell?	-	-	-	-	-	-	1	-	-	-	-	1
Large mammal	1	2	28	10	15	1	4	5		1	2	69
Medium mammal	154	1	79	52	34	7	36	70	1	12	4	450
Mammal (indeterminate)	-	2	9	49	-	1	11	10	4	-	1	87
TOTAL	157	5	134	111	59	13	66	101	5	19	9	679

5.2.6 Condition of the Assemblage

Most of the material from the excavations was severely weathered and fragmented (Table 5.4), to the extent that identification of skeletal element and species was often impossible. A large number of specimens exhibited 'dry-type' fractures, indicating that bones were exposed on the ground surface for a relatively long period of time and trampled. Extensive exposure before burial would explain why bone preservation is extremely poor. However, although bone abrasion (i.e. rounded edges of long bones) is seen at the SP10E-TOP site, it is generally not observed or only at low levels for other Late Bronze Age sites in the Khanuy Valley research area and suggests minimal movement of bone after deposition.

A high proportion of bone specimens recovered from the Late Bronze Age sites exhibit signs of burning and calcination (evidenced by white/blue bone fragments with a chalky texture) (Spennemann and Colley 1990:57). Almost all bones from BMK and MTC are calcined, while a high proportion of bones from MAB, SHA, and WFA are calcined. Only three assemblages (TOP, HUN and HOA), all from Zone B, provided no evidence of exposure to fire (Table 5.4). The overall ubiquity of calcined material suggests that exposure to high temperatures was a common occurrence at the sites (Reitz and Wing 1999:133), and probably contributed to the fragmentary nature of the faunal assemblage. This is perhaps an indication that much of the material accumulated as debris from cooking food, or bones being used as a fuel source, a practice still common today in the research area and commonly discussed in anthropological and archaeological literature (e.g. Thery-Parisot 2002). It may also be that bone refuse around herder camp areas was occasionally gathered and burned intentionally as part of camp maintenance activities. Modern herders inhabiting winter camps often pile and burn the bones of recently butchered animals in piles, as well as other organic and inorganic trash, in order to reduce debris around their sites.

Butchery marks were not a common feature of the assemblage, yet poor preservation, especially burning, weathering and root damage observed on most bones may have obscured both butchery marks and marks caused by scavenging animals (Table 5.4). However, although no bone specimens exhibiting percussion fractures were recovered from any site, almost all bones yielding 'green-type' fractures were highly fragmented (less than 10% in shaft circumference and less than 3 cm in length). High fragmentation may indicate that bones were heavily processed for their marrow and/or grease (Davis et al. 1987; Hanks 2004; Outram 2001), a practice sometimes considered to reflect subsistence stress (Outram 1999, 2001). Noteworthy,

however, marrow extraction is still prevalent in the research area and is considered by local herders a traditional Mongolian custom and a delicacy. The marrow is sometimes eaten straight, and is also used to make bread, or added to milk tea. The presence of similar bone fragments in contemporary campsite contexts where there is no evidence of dietary stress, as well as the known custom of extracting marrow should caution against interpreting such remains as necessarily reflecting subsistence needs and a high level of resource stress. It may simply reflect preferred culinary customs and thus other socioeconomic evidence should also eventually be examined.

Table 5.4 Summary of bone modification characters associated with various taphonomic processes. (* Following weathering stages as defined by Behrensmeyer 1978).

	FOOTHILLS						RIVERSIDE			
	BMK	**QUE**	**TOP**	**WFA**	**JUL**	**HUN**	**HOA**	**MAB**	**MTC**	**SHA**
% Roots	3	0	5.3	7	17	0	50	66.7	100	13
% Abraded	1.8	8.4	21.1	14	0	0	0	3.7	50	15.1
% Patinated	< 1	0	0	2.3	0	0	0	0	0	4.3
% Shaft <10% circumference	100	92	98	96	99	100	100	100	70	94
% Weathered (> stage 2)*	100	72	100	90	98	0	100	98	85	56
% Cut	0	0	0	4.7	0	0	0	11.1	0	4.3
% Percussion	0	0	0	0	0	0	0	0	0	0
% Burned	97	17	0	49	27	0	0	52	100	68
% < 3 cm in length	99	78	90	79	92	90	90	86	77	80
% Fresh fracture	na	18	11.1 (9)	33.3 (56)	1.8 (53)	na	100 (4)	16.7 (30)	42.5 (7)	41.7 (36)

5.2.7 Animal Exploitation

Animal taxa exploited at Late Bronze Age habitation sites in the Khanuy Valley include the four main domesticates for this period and region: horse, cattle, sheep and goat (Table 5.3). In addition, musk deer (*Moschus moschiferus*), the smallest of the deer species was the only wild species encountered in the excavations, although in minute quantity (4% [n=3] of the faunal material by NISP). From the animal bones that could be identified to taxa, sheep/goat is the most commonly occurring taxon (65% [n=45] of the faunal material by NISP), followed by horse (21% [n=15] of the faunal material by NISP) and cattle (10% [n=7] of the faunal material by NISP). Musk deer, with a total NISP of three, only appears at two sites which are located along the Khanuy River in Zone A (SP27E-MTC and SP32E-SHA). Biometrical and morphological data are insufficient to determine the domestic status of the horses and bovids found at these habitation sites, although the domestic nature of horses found at *khirigsuurs* has been confirmed (see below) and those found at occupation areas is highly suggestive.

Indeed, and for comparative purposes, the relative proportion of different faunal remains found at occupation areas in the Khanuy Valley is very different, for example, from what is encountered at the Eneolithic site of Botai (Kazakhstan) where horses – the primarily hunted animal – make up 99% of the faunal material (Dudd et al. 2003; Levine 1999; Olsen 2003). In the Khanuy Valley, despite the fact that horses are the main, if not the only, ritually deposited animal at *khirigsuurs,* they only make up about 21% of the recovered faunal material found in occupation areas (only slightly less than in the subsequent Iron Age/Xiongnu period for which mounted pastoralism is historically well established) and they are always associated with sheep/goat bones (65% of the faunal material). There is thus no reason to believe that these horse bones found at habitation sites were not domesticated species as well. Incidentally, this is also a

good reason for not relying on faunal remains from burial and/or ritual structures to reconstruct subsistence practices!

Furthermore, although only eight equid specimens (including a whole tibia) from the whole domestic assemblage (but from different contexts) provided fusion data, three of which could be securely linked to Late Bronze Age contexts only, the bones fall clearly into two groups. The first group consists of six fused skeletal elements that fall into the early and intermediate categories of bone fusion (2 distal tibias, 1 proximal tibia, 2 pelvis [ischial part], 1 first phalanx), while the second group consists of three unfused skeletal elements (1 proximal tibia, 1 calcaneum, 1 distal femur) that fall into the late and final categories of bone fusion (see Table 5.2 above; and Silver 1969). Such a pattern suggests that the bones of both very young animals and adult animals were missing from the assemblage, and that it consists of horses that died between two and three years of age. Although the sex of these animals is unknown, this age grade corresponds to the maximum meat weight and, if these were male, to a culling pattern possibly linked to a herding strategy (Anthony 2007:204).

While this sample size is extremely small, it is, statistically speaking, very revealing. Indeed, if the mortality distribution was due to herd-driving or random hunting, then we would expect a similar proportion of horses in each age grade (or with slight differences depending if the hunted herd was a family group or a bachelor group [Levine 1999:33]). As an idealized starting point, then, we might expect about 7% 1-year-olds, 7% 2-year-olds, and so on up to 7% 15-year-olds. That means that 87% should be <2 or >3 years-old. Thus, if we were dealing with a population of remains of horses 87% of whom died at <2 or >3, then there is only a 13% chance that the first bone in our sample would have been aged between 2 and 3 years old. The chance that the second bone would also be a 2-3 year old horse is .13 X .13. And so on. The chance that

all 8 bones (from different contexts) in our sample would be from horses aged 2-3 is $.13^8$ or 0.00000008. Therefore, we can be way over 99.99% confident that our sample did not come from a population with 87% of the horses dying at <2 or >3. If, more realistically, the mortality distribution was due to natural attrition, scavenging or livestock husbandry where meat production was of secondary importance (such as for riding/mobility), then we might expect a 'U-shaped' or 'fish-hook shaped' mortality curve, that is, with horses dying at <5 or >8 years-old (Levine 1999:29, 36). Accordingly, if horses 5-8 years old were not culled, then there are 11 age-grades left to be represented among dead horses. If death fell evenly on those 11 age grades, then dead horses in our sample would be 9% 2 year olds and 9% 3 year olds. In this case, that means that 82% should be <2 or >3 years-old. Therefore, if we were dealing with a population of remains of horses 82% of whom died at <2 or >3, then there is still only an 18% chance that the first bone in our sample would have been aged between 2 and 3 years of age. The chance that the second bone would also have been from a 2-3 year-old horse is .18 X .18. And so on. The chance that all 8 bones (from different contexts) in our sample would be from horses aged 2-3 is $.18^8$ or 0.000001. Therefore, we can be way over 99.99% confident that our sample did not come from a population with 82% of the horses dying at <2 or >3. In reality, the nature of a U-shaped distribution involves more 1 year olds, fewer 2 year olds, still fewer 3 year olds, very few 4 year olds, no 5-8 year olds, some 9 year olds, more 10 year olds, still more 11 year olds and so on up to 15 year olds, but in the absence of any available comparative equid assemblage from mobile pastoralist contexts with specific counts for each age grade, the abovementioned even distribution provides the best educated guess for the moment and a close enough estimate for our purposes—especially since however we slice it, the population of horse bones belonging to 2 or 3 year olds is going to turn out to be very unlikely to have come from that U-shaped death

distribution. In fact, the age distribution we have for our 8 horse bones from different contexts (i.e. all about 2-3 years of age) is staggeringly different from the mortality profile we would get from anything but a population herded at least partly for meat, and quite in line with what might be expected if the horse remains found in domestic contexts were mostly horses butchered for meat (Levine 1999:31).

Further support for a herding strategy is provided by two strong facts from horses found at *khirigsuurs*. While these ritually deposited animals cannot be directly linked to subsistence practices, they are probably linked to the feasting activities of the people that occupied the nearby occupation areas. First, it has recently been confirmed that the horse remains found at *khirigsuurs* are indeed domestic species and not Tarpan or Takhi (Przewalski) species (Eurasian/Mongolian wild horses) (Sandra Olsen, personal communication). Second, the age distribution of these horses strongly suggests selective culling (Allard et al. 2007; Sandra Olsen, personal communication). Indeed, of the 15 horse remains from satellite mounds whose age was determined, 9 (60%) were less than 4 years old, 5 (33%) were 15 years old or older, and only 1 (7%) was aged between 4 and 15 years old at the time of death (a 6-7 year old horse). Furthermore, of three mound pairs excavated so far, two are characterized by an older (>15 years) female in the larger mound and a young (< 4 years) horse of indeterminate sex in the smaller mound (Allard et al. 2007). Despite this small sample size, this pattern is once again typical of a herding strategy where meat is of prime importance, that is, a majority of both 2-3 year olds (if these are indeed mostly males) and ca. 15 year old females (Anthony 2007:204; Levine 1999:27, 31).

5.2.8 Wild to Domestic Ratio

As indicated above, only extremely scant evidence exists for the exploitation of wild taxa and no fish remains were found despite systematic screening. This is true for the whole assemblage of 3511 bones, irrespective of exact context. Examination of the results from Late Bronze Age contexts reveals that only three specimens belong to deer (*Moschus moschiferus*). No other wild taxa were identified in the assemblages, although an additional three bone elements belonging to marmot (*Marmota*) were found from an unclear context. Although not the focus of this study, it is worth mentioning that this lack of evidence at habitation sites for the exploitation of wild taxa persists into the Iron Age/Xiongnu period in the research area, a time period for which we have historical evidence that they hunted (Shiji,110: 2888)—but to what dietary extent is not known.

Clearly, the evidence provided by the domestic assemblages suggests an overwhelming emphasis on domestic taxa for subsistence needs. This does not mean that wild species were not exploited during the Late Bronze Age (as was the case during the Iron Age) in this region, but it is likely that they did not contribute much to the overall subsistence requirements of the settlement's inhabitants. That is, they may represent only opportunistic additions to the diet. Certainly, wild animals may have been so sparse in this region during the Late Bronze Age and Early Iron Age that they were just not a very practical resource for exploitation except on a casual and opportunistic basis, no matter how stable or unstable herding was; but it is also highly possible that the extremely low degree of exploitation of wild resources resulted from the fact that herding of domesticates could provide a fairly reliable and predictable source of resources, requiring only very minimal supplementation from wild taxa. In fact, if the number of animals found at *khirigsuur* sites is any indication of the overall availability of domestic faunal resources, it seems likely that they were plentiful in or around the research area. Furthermore, the results of

the faunal analysis suggest that herding practices were probably already well developed at this time. The presence of both sheep (*ovis*) and goat (*capra*), for example, suggests that a system of complementary exploitation of these two species was already in place. "Sheep prefer to graze herbaceous annuals and are more tolerant of cold and wet conditions, whereas goats prefer to browse perennial plants and are better able to withstand heat and drought" (Garrard et al. 1996:210; Lancaster and Lancaster 1991). Accordingly, keeping mixed herds that have complementary feeding behaviors and different climatic tolerances provide an insurance against climatic variability as well as an effective way of utilizing available forage. Regardless, together with the lack of evidence for plant cultivation (and an apparent minimal role of plant collecting), the data presented here undeniably characterize the Late Bronze Age inhabitants of the Khanuy Valley as 'pastoralists', as they are clearly engaged in a mode of subsistence that is based primarily on the exploitation of domestic herd animals (Chang and Koster 1986:99; Cribb 1991:17; Krader 1959:499). It is important to note here, however, that in characterizing these people as 'pastoralists', I do not imply anything about identity issues and other cultural baggage that are sometimes connected to this term. I only imply that their subsistence system revolves primarily around domesticated herd animals with a minimal role for hunting, plant cultivation, or plant collecting.

5.2.9 Seasonality and Mobility

Seasonality of occupation areas based on the age of animals is unclear for the moment. The fact is that specimens exhibiting useful ageing data for determining seasonality were limited to a metacarpal and vertebra belonging to an infant-aged caprine from SP27E-MTC and a rib blade from an infant-aged medium-sized ungulate from SP31E-JUL. In the Khanuy Valley, sheep and goats are usually born from February to May, and horses and cattle from March to May. The

presence of bone specimens from infant animals (but not neonates) in the SP27E-MTC (a riverside occupation area) and SP31E-JUL (an occupation area located along the foothills) assemblages thus suggests the possibility that occupation of both sites included the late spring to early summer months.

The picture is much clearer, however, when we consider the ratio of bones to sherds and the types of animals recovered in each zone. This is presented in Figure 5.1 as a proportion—bones as a proportion of the total number of bones and sherds. Indeed, we can have very high statistical confidence that the proportion of bones of all kinds is higher at occupation areas located along the foothills than along the river—which is expected since today at least this is the location of seasonal winter campsites where more butchering occurs, including the butchering of large mammals (see below).

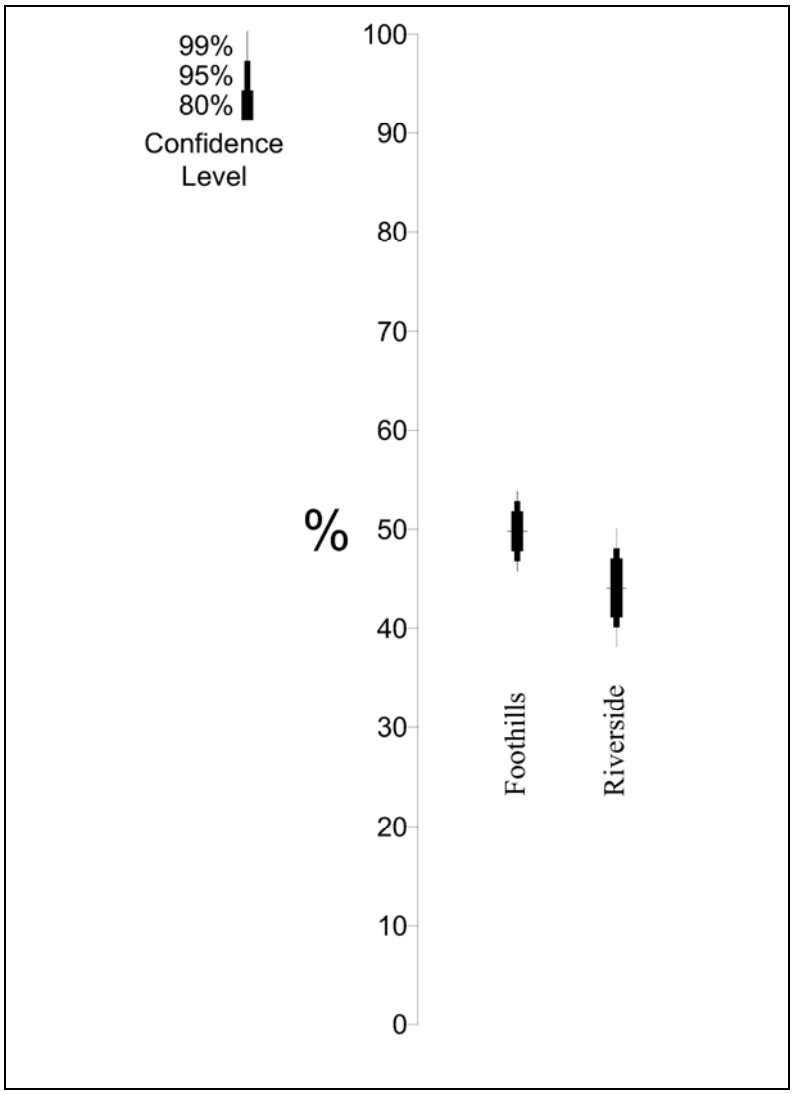

Figure 5.1 Proportion of bones to sherds according to zone.

Indeed, there seems to be an important difference in the proportion of bones of large mammals between occupation areas that are thought to represent 'winter' (foothill location) and 'summer' (riverside location) occupations on the basis of ethnographic observations (Table 5.5). In fact, while the 'medium mammal' (sheep/goat) frequency is very similar between the two zones, the proportion of 'large mammal' remains (horse, cattle) is noticeably higher in foothill locations than in riverside locations, and we can have very high statistical confidence in this

observation (Figure 5.2). Of significance here is the fact that modern Mongolian herding families generally kill large animals (cattle and horses) only during the late fall (usually around November, which also corresponds to when the animals are the fattest) so that meat does not go to waste due to spoilage (Levine 1999:25). Interestingly, this also corresponds to the time when horses associated with *khirigsuur* monuments were most likely slaughtered (Sandra Olsen, personal communication).

Therefore, the different proportion of bones in each zone and the differential distribution of faunal remains between sites located along the foothills and sites located along the Khanuy River substantiates the suggestion from ethnographic observation that camps located in the small draws at the edge of the valley could have indeed been winter camps, while occupation areas located near the river could have been summer camps (i.e. a very restricted mobility pattern). The fact that cattle remains are only found in foothill site locations further substantiates the idea that these locales were probably winter campsite locations, while the presence of musk deer at sites only located along the river suggests that these locations were probably summer/fall campsites since today, at least, deer hunting in Mongolia is practiced in late summer/early fall when these animals are at their maximum weight.

Regardless, taken together, all these seasonal indicators further support the idea that Late Bronze Age people occupied this whole area year round. Indeed, there is evidence that they occupied this region during the late spring to early summer months (evidenced by the young animals at occupation areas), the late summer/early fall months (evidenced by the deer remains at occupation areas), and during the fall/winter period (evidenced by the highly probable seasonality of horses at *khirigsuurs*). Accordingly, the available Late Bronze Age faunal data does suggest a perennial occupation of the research area, and thus supports the very restricted

mobility pattern during the Late Bronze Age that was suggested by the settlement pattern data presented in Chapter 3.

Table 5.5 Total NISP for Late Bronze Age sites (LBA contexts only).

	NISP		PERCENT ABUNDANCE	
	Riverside	**Foothills**	**Riverside**	**Foothills**
Mammal	20	64	10.6	12.8
Large mammal	12	55	6.4	11
Bos sp.	-	7	-	1.4
Bos/Equus	-	2	-	< 1
Equus sp.	8	7	4.2	1.4
Medium mammal	119	344	63.3	68.8
Ovis/Capra	16	18	8.6	3.6
Capra sp.	6	1	3	< 1
Ovis sp.	3	2	1.6	< 1
Moschus moschiferus	3	-	1.6	-

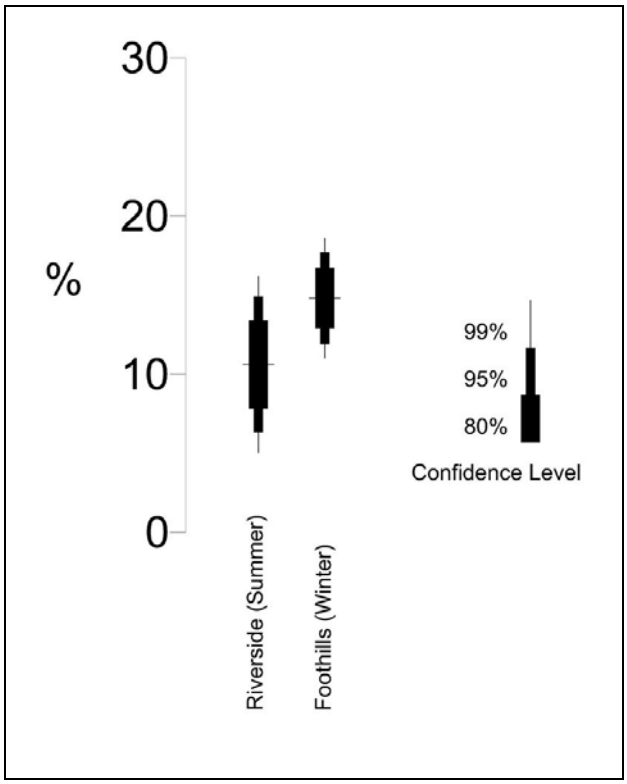

Figure 5.2 Differential proportion of large mammals (including horse and cattle categories) between Riverside (summer) and Foothills (winter) campsite locations.

5.3 COMPARING FAUNAL EXPLOITATION BETWEEN OCCUPATION AREAS

While the small sample sizes and the highly fragmentary nature of the assemblages make it difficult to confidently compare the exploitation of different fauna between occupation areas, there are a few patterns worth discussing. First, since sheep and goat—the most commonly occurring taxon—have been identified in various occupation areas throughout the research area, it is reasonable to assume that the category 'Medium mammal' in Tables 5.3 and 5.5 represent mostly sheep/goat. Taking this as a likely scenario, then it is apparent that sheep/goat was exploited at every occupation area. Similarly, while we cannot exclude the possibility that some

of the unidentified 'Large mammals' in Tables 5.3 and 5.5 were cattle, the higher frequency and the higher proportion of identified horses throughout the research area suggests that these probably make up most of this category. Apparently, therefore, inhabitants of all the occupation areas in the research area were engaged in the exploitation of both of these categories of animals, which probably represent mostly sheep/goat and horses. The exploitation of both these taxa at all occupation areas, and especially the specific proportion of sheep/goat in the assemblage (i.e. ca. 60%), are, incidentally, common patterns amongst pastoralists found throughout Inner Asia (Barfield 1993:137-140).

There are, however, apparent differences in the proportions of these two categories between occupation areas. Figure 5.3 shows that while the majority (n=8) of occupation areas have on average 55% 'Medium mammals', one occupation area (BMK) has a noticeably higher proportion of 'Medium mammals' (i.e. 98%); and two, MAC and HUN, have much lower proportions of such mammals (i.e. 20%). MAC is the small oddly located occupation area along the foothills in Zone A, while HUN is located the farthest away from any Late Bronze Age monuments in Zone B. The latter has also the lowest relative demographic index amongst sites excavated along the foothills. While the bullet graphs indicate that we can be highly confident statistically about the difference in these proportions for BMK, the high error ranges for both MAC and HUN allow us only to be moderately confident about these differences for the latter two occupations. By contrast, where BMK shows a considerably higher proportion of 'Medium mammals' compared to other occupation areas in the research area, Figure 5.4 suggests that BMK had the lowest proportion of 'Large mammals' after HUN, which has none. And we can be highly confident in this statement.

Further examination of Figure 5.4 shows that four (MAC, WFA, QUE, HOA), but especially one (MAC) occupation area stands out as having the highest proportion of 'Large mammals'. By contrast, MAC has one of the two lowest proportions of 'Medium mammals' in the whole of the research area. This may thus suggest that the inhabitants of this occupation area were more specialized in herding 'Large mammals'. It may also mean that they butchered and/or consumed more 'Large mammals' than others, despite the possibility that they were not herding them themselves. The latter is actually more probable given the limited space within this small occupation area, although animals could have been kept a short distance away. Owing to the large error ranges, however, we can only have very little confidence that these differences in proportions are not only due to the vagaries of sampling.

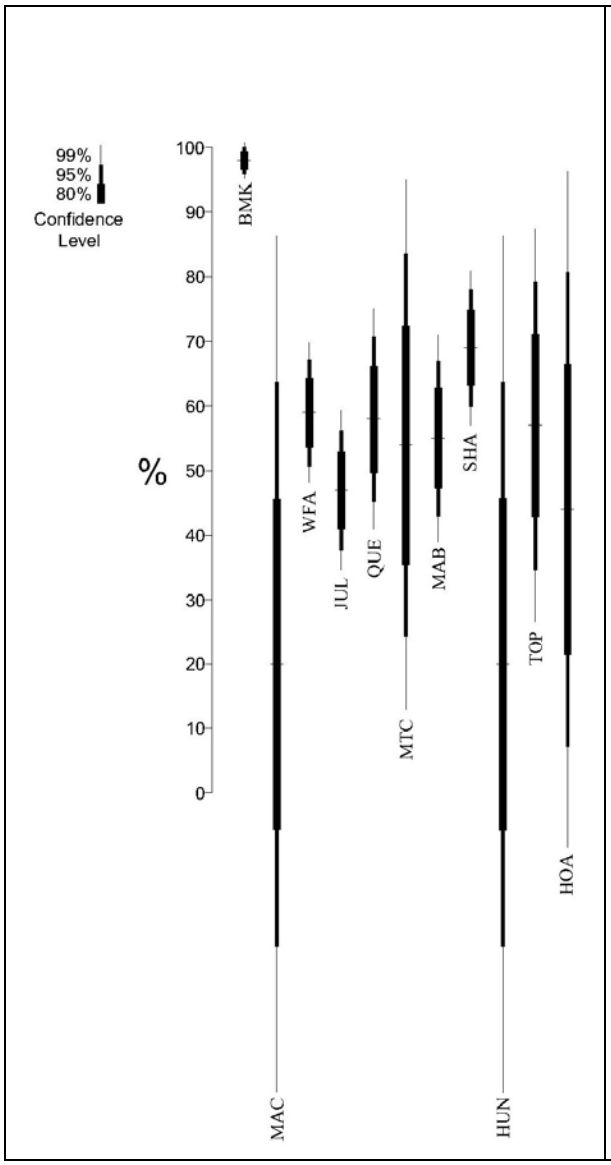

Figure 5.3 Proportion of 'Medium mammals' per occupation area.

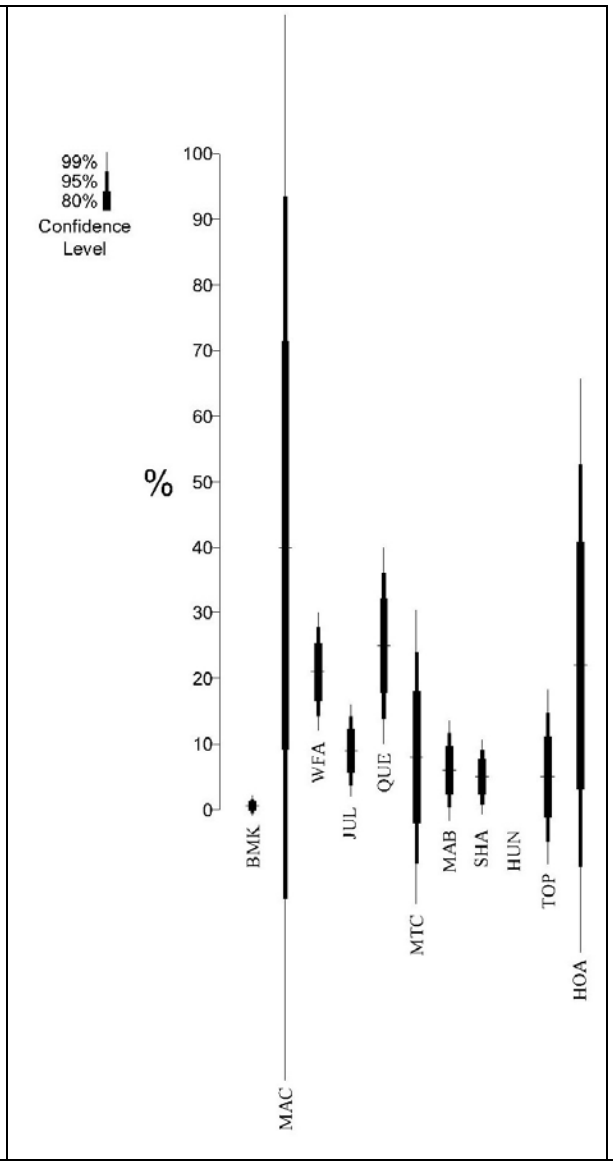

Figure 5.4 Proportion of 'Large mammals' per occupation area.

Continuing the exploration of differences in faunal exploitation between occupation areas suggests other interesting patterns. First, cattle (*Bos*) seem to be restricted to only three occupation areas (SP22E-BMK, SP26E-WFA, and SP31E-QUE)—all in similar proportions (Figure 5.5) and all located along the foothills in Zone A. While it is possible that some of the

bones in the 'Large mammal' category at other occupation areas belong to *Bos*, it is doubtful that this discrepancy has only to do with the difficulty of properly identifying bones, since cattle bones are at least as robust as the other taxa present here. Its low frequency may instead signify that this animal was not yet fully integrated into the domestic economy. The fact that they are restricted to only three occupation areas within the whole research area may also suggest the possibility of differential access to this 'new' animal. Indeed, while cattle is well attested during the subsequent Iron Age/Xiongnu period in the region and beyond, they have yet to be found in any other context (domestic, ritual or burial) in the region prior or during the Late Bronze Age, despite the fact that they were the most numerous domesticated animal (followed by sheep and horse) just prior and during this period in the neighboring Minusinsk region of Southern Siberia (Legrand 2006). The importance of this, maybe related to differences in status, once again, will be further discussed in Chapter 6.

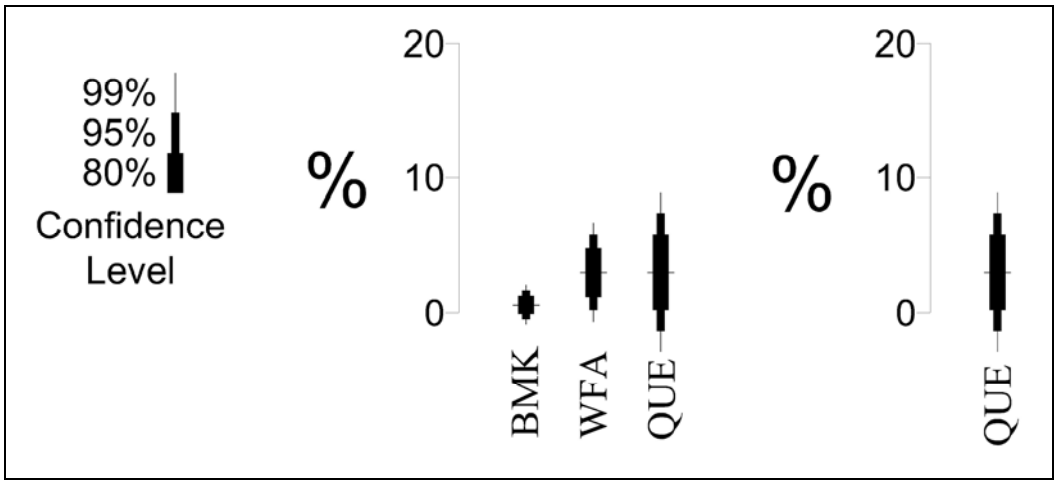

Figure 5.5 Proportion of *Bos* and *Bos/Equus* bones respectively
at occupation areas where they were present.

Finally, when contrasting the proportion of the different faunal remains between occupation areas, it is clear that BMK is the greatest outlier. BMK has not only the highest proportion (>98%) of medium sized mammals (probably sheep/goat), but conversely it also has the lowest proportion (<2%) of large sized mammals (probably horse and cattle), which wealthier and more prestigious households usually have more of (Christian 1998:187; Howe 2008: Chapter 2). At first glance, this could suggest the possibility of some early and particular form of "pastoral feudalism" (and I take this term lightly) where poorer families take care of part of a wealthier family's herd (usually sheep/goat) in exchange for some of the animals' byproducts—something that is well attested for in more recent times (Fernandez-Gimenez 1999:320; Jagchid and Hyer 1979:298; Lattimore 1962:546-550). Furthermore, despite the fact that we can only have little statistical confidence in this observation (see Figures 5.3 and 5.4), this might also explain the inverse pattern found at MAC, that is, a much lower proportion of 'Medium mammals' and a much higher proportion of 'Large mammals'. Accordingly, the much higher than average proportion of medium mammals together with the much lower proportion of large mammals at BMK might be explained by the possibility that people living there were herding animals (sheep/goat) belonging to another household—possibly those of MAC. Of course, this may not have been a "feudal system" at all since it might also have been based on a common agreement and/or the shared ownership of herds. To be sure, as we shall see in Chapter 6, BMK has more artifactual indicators of status than does MAC, a pattern that is contrary to what would be expected if the inhabitants of BMK were the poorer and dependant ones. Accordingly, inhabitants of BMK could simply have been wealthier in terms of the number of sheep/goat they had (and this is also one of only three sites were cattle remains were found), while the inhabitants of MAC could have been engaged in activities other than herding—which

on the surface seems the most plausible. The implications of this in terms of status will also be discussed in the following chapter.

5.4 SUMMARY

In sum, despite some differences in the proportions of herded animals between occupation areas, the overwhelming lack of evidence for alternative subsistence strategies discussed in the first part of this chapter (i.e. little evidence of wild species, no artifacts related to plant cultivation, no domestic plant remains discovered despite systematic screening and some flotation), together with the seasonality evidence suggest that the most likely economic strategy for the groups living in the Khanuy Valley during the Late Bronze Age was a well established restricted form of mobile pastoralism, primarily based on the herding of sheep and horse, and to a lesser degree goat and cattle (for a select few), with only minimal supplementation of wild plants and animals.

6.0 SOCIAL AND ECONOMIC DIFFERENTIATION

The emergence of social and economic differentiation is of obvious importance to the topic of the evolution of complex societies (Earle 1987, 1991; Hayden 2001; Hirth 1993; Price and Feinman 1995). And in this present quest to explain what kinds of processes may account for the first clear steps toward hierarchical organization and status differentiation in central Mongolia, the topic is of clear importance for evaluating the nature and social organization of the groups that inhabited this area during the pivotal Late Bronze Age. The ability to identify ranking (social differences) in the archaeological record, if present, is thus crucial to the issue.

Before doing this, however, I begin this discussion with brief definitions of what I mean by 'social status' and 'economic specialization'—both of which are addressed in different sections of this chapter. First, I take 'social status' to be a very broad category of hierarchical social differentiation that could subsume more specific features like wealth or prestige. At this stage of the research I do not find it useful (or even possible) to tease out these differences. Certainly this is a worthwhile endeavor and it will eventually be dealt with, but for now it avoids having to make a subjective distinction, for example, between whether the differential number of domesticated animals per occupation area discussed in Chapter 5 represents wealth or prestige differences. In all likelihood they represent both and this is well recognized ethnographically. For example, having domestic animals in Southeast Asia (Hayden 2001), and accumulating large herds of animals in pastoralist societies (Solomon et al. 2007:484) not only brings wealth but

also social prestige. What is important here as a first step is identifying whether or not there was social variability of a hierarchical nature in Late Bronze Age Mongolia, and if so to what degree.

Second, in this present study I consider 'economic specialization' in a manner that also refers to the sorts of minimal differentiation of productive activities that may even occur in early forms of complex societies. In this sense, "even part-time specialists differ from non-specialists" (Wason 1994:107). Once again, the important objective right now is not to pigeonhole everything in discrete categories, but to evaluate if and how social variability is expressed and if so in what social spheres they are expressed. The following section addresses the issue of social status, while economic specialization is dealt with subsequently.

6.1 ARCHAEOLOGICAL INDICATORS OF SOCIAL STATUS

Three types of data are frequently used to identify status differences: burials, residential architecture and household artifacts (Smith 1987). In the case of pastoralists, as discussed above, we can also expect status to be tied to larger herd sizes (e.g. Earle 1997:100; Fratkin and Roth 1990), which in archaeological terms may in some cases be observed by larger, more elaborate corrals (Aldenderfer 2001:407). In addition, indicators of feasting activities may also be present, particularly those that are linked to alliance building and generating reciprocal obligations (Hayden 1995, 2001).

It has been argued in Chapter 1 that the burials and the monumental structures of the Late Bronze Age are ambiguous in terms of evaluating the nature of the social and economic organization of the peoples inhabiting the Khanuy Valley at this time. They do suggest a complex social organization; and the size and elaboration of some of these monuments do

suggest fairly large labor investments and social differences, but they have yet to produce the more direct kinds of data, such as grave goods, that correlate specifically with social status. The apparent absence of any kind of residential architecture for the Late Bronze Age, however, also impedes our ability to identify the possibility of higher status people by examining whether or not there were larger or more elaborate houses—perhaps the strongest expressions of status differences (Hirth 1993:123; Smith 1987; but see Cribb 1991:101-105). By extending the analysis to include variation in domestic activities, however, it is possible to evaluate if and how social variability is expressed in everyday life. To be sure, domestic artifacts are typically good markers of social status (Hirth 1993; Turkon 2004; Smith 1987).

Although data is relatively scarce and comparative inventories are difficult to gather for Late Bronze Age Mongolia (Honeychurch 2004:118), according to what is known from at least some burial evidence higher status occupation areas could be indicated by larger quantities of metal goods, especially those of symbolic as well as practical nature such as buckles and bronze buttons (Tsybiktarov 2003:91), bronze arrowheads or possibly Karasuk-type daggers and knives. High status occupation areas could also be identified by the presence of other prestige items, including long-distance trade goods (Hirth 1978; Kristiansen 1991:33, 1998:187; Smith 1987) such as Karasuk items once again (Askarov et al. 1992; Gryaznov 1969:98; Legrand 2004; Volkov 1967, 1995), as well as cowries and mother-of-pearl, turquoise beads, etc. (Erdenebaatar 2002, 2004; Ishjamts 1994:152; Volkov 1995:321; personal observations). While the identification of these abovementioned items in domestic contexts is doubtful due to their usual location in burials (i.e. they are not expected to be abandoned in non-burial contexts due to their high value), higher status occupation areas could also be indicated by higher proportions of high quality ceramics or lithics generally. The range of variability in the quantity and quality of these

items between occupation areas would speak to the degree of social differentiation, while the nature of the evidence would relate to the bases of social differentiation.

6.1.1 Metal Goods

Almost nothing of the sorts described above in terms of metal goods has been found in the excavated Khanuy Valley occupation areas. Save for one bronze arrowhead discovered at the SP32E-MAB occupation area, no metal goods (either of symbolic or of practical nature) have been recovered. One bronze vessel fragment identified generally to the Late Bronze Age/Early Iron Age was found on the ground surface during the systematic shovel-probe survey, but its context is unclear and nothing else was found associated with it. The nearest site is SP08E-GER (a very small mixed Bronze Age/Xiongnu site) and nothing else was found there that might suggest the site of a higher status person/group.

6.1.2 Faunal Remains

Where there is possibly a slight hint of discrepancy between occupation areas, as mentioned in Chapter 5, is in the differential presence of cattle (*Bos*). Indeed, while sheep/goat and horse are apparently present at all campsites, it is noticeable that cattle (*Bos*) are only clearly present at three sites (SP22E-BMK, SP26E-WFA, and SP31E-QUE), all located in the largest valley draws along the foothills in Zone A—the zone located at the heart of a cluster of monumental sites. This might be important since it is the first clear evidence at the moment for the presence of cattle in this region during the Late Bronze Age. While there is very little known, not to say nothing, about cattle domestication in Mongolia (see Chapter 1), domestic cattle only really make their mark in the archaeological record during the subsequent Iron Age Xiongnu period when they are attested as draft animals and when parts of these animals are also deliberately

deposited in burials (e.g. Miller et al. 2006 for a Khanuy Valley example). By contrast, beyond the cattle remains discovered at the three abovementioned sites, there is as yet no other evidence of cattle in any Late Bronze Age contexts (domestic, ritual or funerary) in the Khanuy Valley region. And this is despite the fact, once again, that cattle were the most numerous domesticated animals just prior and during this period in the neighboring region of southern Siberia (Legrand 2006) and the second most prevalent animal in neighboring southeastern Kazakhstan (Frachetti 2004:357). Therefore, differential access to this 'new' animal in this region could indicate differences in status.

Further evidence for the possibility of status differences comes from the differential proportion of animals at different occupation areas. Certainly, while it is archaeologically difficult to discuss status differences based on relative numbers of animals (e.g. Cribb 1991:35, 42)—although this is well attested for ethnohistorically among pastoralists – see for example Bonte 1977; Khazanov 1994:152; Shahrani 1979:165, 182; Vainshtein 1980:103-109), it is noticeable that the three occupation areas which yielded cattle remains (BMK, WFA, QUE) also yielded amongst the highest proportion of large and/or medium sized mammals (see Figures 5.3 and 5.4 in Chapter 5). Of these three occupation areas located in Zone A, two (BMK and WFA) also have the highest indicator of status based on proportions of decorated ceramics (see full discussion of this below). SP22E-BMK is particularly intriguing since it is an outlier in terms of proportions of large and medium mammals from all other sites in the research area. Indeed, this occupation area produced by far both the highest proportion (98% [n=154] by NISP) of medium sized animals (sheep/goat) and the smallest proportion (0.6% [n=1] by NISP) of large mammals (horse, cattle) and we can have high statistical confidence in this observation (see Figures 5.3 and 5.4 in Chapter 5). While this discrepancy is difficult to explain, the occupants of this site

could simply have been more specialized sheep/goat herders. For some reason, however, they are also amongst the very few to have had early access to cattle, and this is despite the fact that the inhabitants of this occupation area were apparently not as invested as others in the research area in the herding of the other large mammal: horses. The meaning of all this is somewhat perplexing, but it does position the inhabitants of this occupation area in a realm of their own.

Conversely, the occupation area SP26E-MAC finds itself at the other end of the spectrum in terms of proportions of large and medium sized animals. Indeed, while it is not possible to say anything with any high statistical confidence in terms of proportions of various animals (see Figures 5.3 and 5.4 in Chapter 5), this occupation area did reveal the lowest overall number of faunal remains in Zone A (NISP=5; see Table 5.3 in Chapter 5)—and this is despite the fact that the evidence for population levels based on the length or intensity of seasonal occupation is not insignificant, especially when compared to what is observed in Zone B (see section 3.7 in Chapter 3). In all likelihood, therefore, the inhabitants of MAC were probably involved in activities other than herding, providing them with social distinctiveness of whatever kind. Indeed, it is not possible at the moment to suggest anything more than this for the inhabitants of this occupation area since beyond the important discrepancy in the number of faunal remains, no other social markers have been found at this occupation area beyond long-distance items found in related 'slope' burials (see below). Perhaps the particular status of the inhabitants at SP26E-MAC was of a nature that would not necessarily be reflected in their material culture, such as ritual specialists of a shamanistic type (Jordan 2001).

6.1.3 Long Distance Interaction: Regional Economic Exchange?

As discussed by Honeychurch (2004:56) and others, long-distance exchange and tribute extraction are thought to be major sources of political capital for steppe elite. To be sure pastoral

nomads often employ long-distance exchange to maintain both internal polities and alliances and exchange with peripheral communities (Kristiansen 1998:187). Evidence of long-distance interaction does exist for the Late Bronze Age, mostly from items found in 'slab burials' (see above and Chapter 1); but it is also strongly suggested by the network-like distribution of *khirigsuurs* and deer stones which show remarkable structural similarities over great distances, as well as through deer stone imagery and the possible links with Karasuk and Tagar in southern Siberia.

In terms of material remains, however, only three items from different contexts indicate medium to long-distance contact in the Khanuy Valley research area. One of these items is a fragment of jade/chalcedony that was found in a 'slope burial' at SP26E-MAC in Zone A (Figure 6.1). Another of these items is a turquoise bead found within another 'slope' burial that is part of the same group of burials as the previous one (Figure 6.2). After 8 years of working in the Khanuy Valley, there is still no evidence for a local source for these materials. However, similar turquoise beads have also been found in other Late Bronze Age burials (mostly 'slab burials') in Egiin Gol, a region to the north of the Khanuy Valley, as well as at Baga Gazaryn Chuluu in the northern Gobi region (Wright 2006:273; Honeychurch, personal communication). While no sourcing has been done yet, it is the consensus amongst archaeologists working in Mongolia at the moment that these items are not local. Nevertheless, as Wright points out, these items could easily be local to the northern regions of Mongolia—a mineral rich area—or they could be from thousands of kilometers away (2006:283). Regardless, the items found in the Khanuy Valley research area do not seem to be of local procurement. Interestingly, while these materials are known to have been used as early as the Neolithic, jade and turquoise objects are more commonly found in later Iron Age Xiongnu period burials and after.

Figure 6.1 Fragment of jade/chalcedony from a 'slope' burial at site SP26E-MAC.

Figure 6.2 Turquoise bead from another 'slope' burial at site SP26E-MAC.

The only other item which suggests long-distance ties is a ceramic vessel fragment found in an occupation area in Zone B (SP07E-SOV)—a ceramic type that has no known parallels in the region (Figure 6.3). The only other place where similar ceramics have been found is in the Baikal area of northern Mongolia (Erdenebaatar, personal communication).

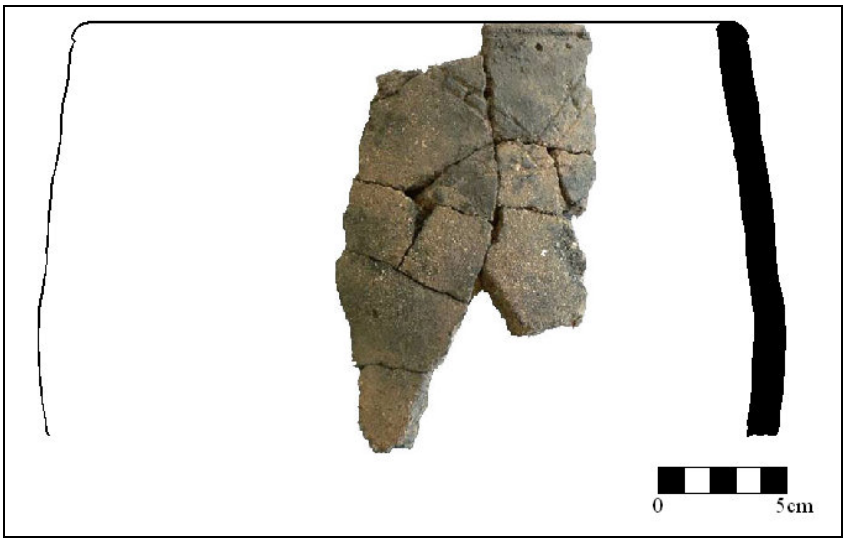

Figure 6.3 Non local vessel type from SP07E-SOV.

This is indeed very scant evidence for long-distance interaction and it is doubtful that it would have had much economic importance—although it is clear that it does not have to in order to provide important indicators of status (see for example Malinowski's study of the Kula Ring in Melanesia). Indeed, as Renfrew and Bahn point out, "interaction involves the exchange not only of material goods but of information, which includes ideas, symbols, inventions, aspirations, and values" (2004:389). It may well be, therefore, that it was the symbolic/ideological aspects of interaction rather than the material goods themselves that were the most significant in defining social status—perhaps to establish and reinforce alliances.

6.1.4 Ceramics and Social Differences

As mentioned above, another way of looking at social status is to evaluate whether or not some occupation areas have higher proportions of high quality items (Smith 1987). No especially fancy prestige goods were discovered during excavations, yet ceramics make up an important part of the artifactual corpus. And since it is assumed that higher status people will usually have access to more elaborate or fancier dishware—for feasting activities for example (e.g. Junker 2001),—then it can be assumed that a greater proportion of higher-quality/fancier ceramics at only some sites could indicate the presence of comparatively higher status people (Kruschek 2003; Smith 1987; Turkon 2004). While it is certainly possible for 'commoners' to have access to at least some prestige items, it is anticipated that higher status people will have access to relatively more of them (Smith 1987:314). Due to the fact that potsherds from our ceramic inventory are usually very small fragments of the original vessels, relative differences in status can mostly be assessed through the relative abundance of decorated ceramics. Too few rim sherds have been found to compare vessel types, but their analysis does provide information regarding the relative size of some vessels.

6.1.4.1 Decorated Ceramics

Following Kruschek (2003), decorated ceramics were defined as sherds with any features indicating additional production steps in the fabrication of the vessel beyond basic forming and firing (e.g. incisions, punctuates, applications, etc.).

The stem and leaf plot below shows the percentage of decorated ceramics at each occupation area (Figure 6.4). There are four, but especially three occupation areas (one with an outside value) that show distinctively different proportions of decorated ceramics (BMK, SOV, WFA, TOP), as all fall far away from the bunch where the majority of the numbers lie. To be sure, the three occupation areas with the highest proportion of decorated ceramics have percentages much higher (i.e. >12%) than the very low median percentage (i.e. 3%) of the other ten occupations. These are not errors in data recording and thus truly suggest relatively important differences in proportions of decorated ceramics. Certainly, the sample sizes are overall fairly small, but only two of the ten occupation areas within the group with small proportions of decorated ceramics have less than 25 sherds; and small sample sizes in and of themselves, as Kruschek (2003:185) has pointed out, should not systematically favor undecorated sherds. Regardless, there is a moderate to high statistical confidence level that these differences in proportions of decorated ceramics are meaningful, especially if we only consider the three occupation areas with the highest proportions (i.e. SOV, WFA, TOP) (Figure 6.5). SOV in Zone B, and WFA in Zone A, stand out in particular. Indeed, we can be over 95% confident that these differences in proportions of decorated ceramics at these two occupation areas are not just due to the vagaries of sampling (Figure 6.5). Therefore, according to the evidence from decorated ceramics, the three to four occupation areas with substantially higher proportions of decorated ceramics appear to have been inhabited by relatively higher status people—and this is even more

probable for those inhabiting SOV and WFA. Statistically speaking and due to the overall small sample sizes and large error ranges, however, there are apparently very little differences in the proportion of decorated ceramics between these four occupation areas. Accordingly, all four can be considered to have similar levels of status indicators based on the proportion of decorated ceramics alone. Two of these occupation areas are located in Zone A (BMK and WFA), and two are located in Zone B (SOV and TOP).

Number of Cases	14
Minimum	0 %
Maximum	23 %
Median	3 %

```
        0 H 00011
        0 M 2333
        0   4
        0
        0 H 8 (BMK)
        1
        1   2 (SOV)
        1   4 (WFA)
* * * Outside Values * * *
        2   3 (TOP)
```

Figure 6.4 Stem and leaf plot of the percentage of decorated Late Bronze Age ceramics in occupation areas from the test excavations.

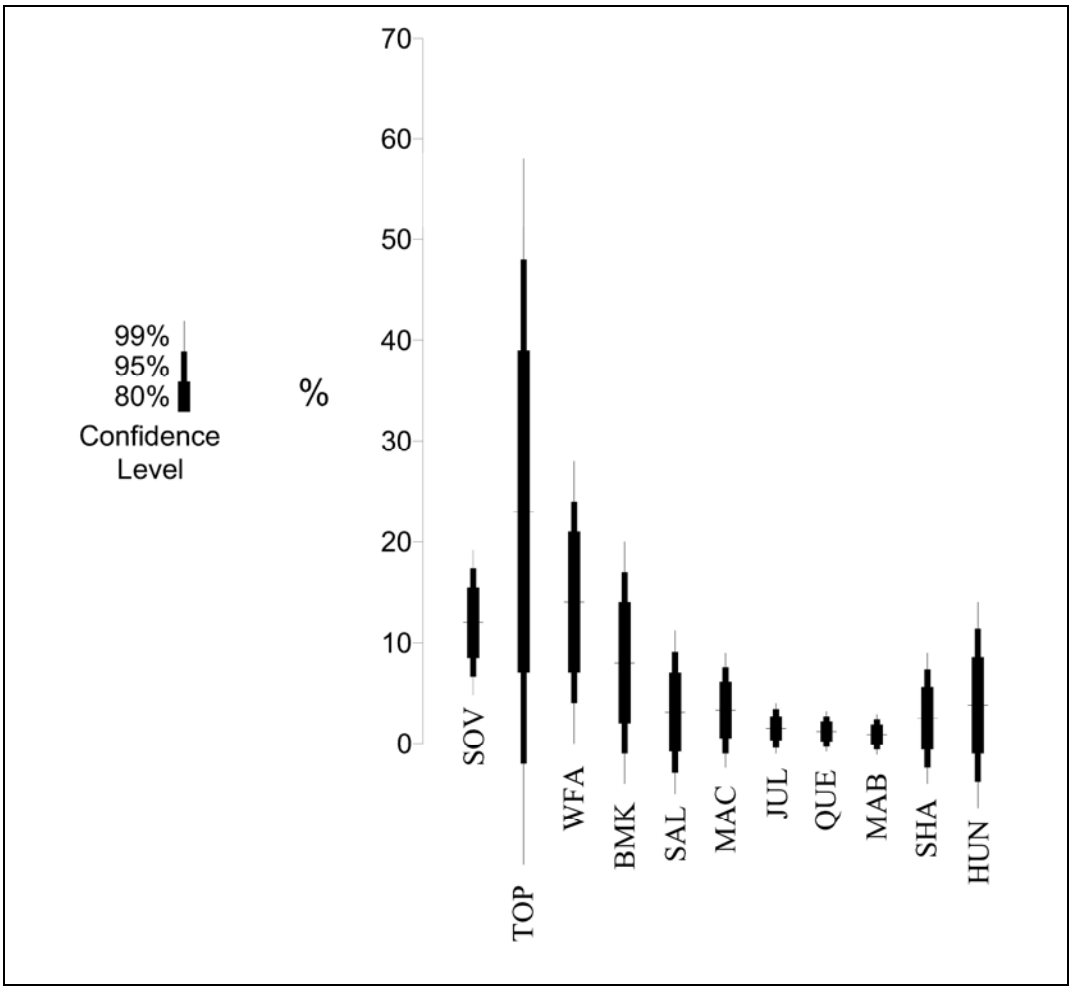

Figure 6.5 Proportion of decorated ceramics per occupation area (note: the three occupation areas with no decorated ceramics [GER, HOA, MTC] are not represented).

6.1.4.2 Vessel Size

The analysis of rim diameters provides additional information regarding the possibility of differences in dishware types between different occupation areas. The stem and leaf plot below shows the differences in rim diameters (Figure 6.6). Two vessels stand out as being much larger than the others, which in turn may suggest either larger serving or storage vessels (the relative thickness of the walls supports this). Both of the large-diameter rims come from two different

vessels, which are nonetheless similarly decorated (i.e. with fingernail impressions). The fact that both of these unique large diameter rimed vessels come from a single occupation area suggests that there were plausibly different activities going on at this site which is located within a valley draw along the foothills in Zone B (i.e. SP07E-SOV). It is also worth mentioning that the vessel with the fourth to largest rim diameter is also located within this site. Although it is not decorated, this rim is more elaborate in shape than others at this site and comes from a completely different vessel type, one that is not seen in any other occupations in the research area (see second example in Figure 2.1). Finally, it is noteworthy that this occupation area is also one of the three abovementioned high outliers for decorated ceramic percentages.

Number of Cases	14
Minimum	10 cm
Maximum	50 cm
Median	24 cm

```
1   0
1 H 668
2 M 0244
2   68
3 H 2 (SOV)
3   6
4
4   8 (SOV)
5   0 (SOV)
```

Figure 6.6 Stem and leaf plot of the diameter of rim sherds (in cm) found in occupation areas during the test excavations.

6.2 SUMMARY OF STATUS INDICATORS

While there is a lot of variability, four (but especially one) occupation areas stand out in particular in terms of having the most identified markers of status differentiation: three in Zone A (BMK, WFA, MAC) and one in Zone B (SOV). Indeed, compared to all the other occupation areas, BMK and WFA are characterized as having both a higher proportion of animals generally and a high proportion of decorated ceramics. In addition, these occupation areas are two of the only three sites to have yielded cattle remains.

MAC, on the other hand, distinguishes itself by having yielded the fewest faunal remains, and this despite the fact that the site seems to have been occupied fairly intensely or for a lengthy period of time. This type of occupation together with the lack of faunal remains thus suggests that the inhabitants of this occupation area were engaged in activities other than herding, the nature of which is unknown for the moment. However, while the domestic assemblage did not reveal any other status markers, two 'slope' burials at this occupation area revealed non-local goods that suggest long-distance interaction. BMK and WFA, as well as MAC are located in Zone A—the zone located at the heart of a cluster of monumental sites.

The occupation area to stand out the most, however, is SP07E-SOV in Zone B. Indeed, like MAC, SOV revealed very few faunal remains, none of which could be tied to Late Bronze Age contexts alone, thus indicating that its inhabitants were also engaged in activities other than herding. But most interestingly, it is the only occupation area to have revealed both a higher proportion of decorated ceramics and larger vessels based on rim sherd diameters. This occupation area is also the only one where 'foreign' ceramics have been found (i.e. the type known from the Baikal area of northern Mongolia—see above). Oddly enough, this occupation

area is not only located in Zone B, but it is also not spatially associated with *khirigsuurs* or other Late Bronze Age burials as was the case for the other three higher status occupation areas in Zone A discussed above. Accordingly, the relation between social status—however scanty the evidence is—and proximity to monumental ritual structures is ambiguous, although a single deer stone is located a short distance from SOV.

6.3 SPECIALIZED ECONOMIC ACTIVITIES

Craft specialization is also often considered as a material correlate and sometimes even a defining characteristic of increasing societal complexity (Blanton et al. 1993:17; Price and Brown 1985). In addition, since "craft specialization involves a new division of labor in which individuals or groups are able to focus their efforts on the production of a limited range of goods" (Kaiser 1984:280), specialization is often seen as a key index for determining the nature and scale of societal complexity. The use and/or differential distribution of these specialized items could thus indicate socioeconomic differences (Brumfiel and Earle 1987), as well as the nature and scale of these differences. In the present context, and based once again on the limited data there is from Late Bronze Age burials, such specialized activities could be indicated by concentrations of such artifacts and features as metal ore fragments, slag, crucibles, or unfinished metal items (metal production); stone querns or hoe ring-weights (agriculture [Erdenebaatar 2002:239; Tsybiktarov 2003:83]). Specialized activities could also be indicated by technological evidence for specialized pottery production or from the indication of high proportions of debitage (flaked stone tool production).

6.3.1 Metallurgy

There is no, or very little, evidence for metal production in the research area during the Bronze Age. While it is true that a fairly large amount of slag was recovered from various occupation areas (especially considering the limited extent of excavations), most of it seems to be related to Iron Age/Xiongnu contexts. The exception to this may be a single piece of what seems to be bronze slag, based on its color. Unfortunately, it was found in a mixed Bronze Age/Iron Age context; and without compositional analysis and any clear contextual information it is not worth speculating any further on its temporal association. This will have to be dealt with in the future through more careful excavations and metallurgical analysis. Regardless, the absence of any concentration of bronze slag, crucibles and unfinished metal items suggest that there was no specialized metal production in this part of the Khanuy Valley during the Late Bronze Age.

The known metallurgy in Mongolia at this time, however, argues by its very characteristics for a degree of specialized production. Whether or not bronze production centers were far away or relatively local is still unclear as research on the origins of bronze production in Mongolia is in its initial phase. Some studies based on common alloy formulas and stylistic similarities suggest links between some Mongolian bronze artifacts and the Karasuk bronze tradition (Volkov 1967). More recent studies based on compositional variability, however, are increasingly suggesting the possibility of several independent metal production centers within the borders of Mongolia as well. At the moment three main sub-zones have been identified: the Mongolian Altai region, the southern Gobi desert-steppe region and the Khangai forest-steppe region (Erdenebaatar 2004:218). While the latter encompasses the Khanuy Valley, the lack of evidence for production of bronze artifacts at any scale in the research area suggests the likelihood that metal objects were not made in this part of the Khanuy Valley during the Bronze

Age—at least nothing of a specialized nature. This is especially made clear by comparison with the almost ubiquitous evidence for metal production that was found in the area for the subsequent Iron Age/Xiongnu period (Houle, n.d.). Despite the apparent absence of bronze production in this part of the Khanuy Valley, the various and finely crafted depictions of bronze items on the numerous deer stones found in the research area do suggest that these people were well aware of these bronze objects—to the extent that it is plausible that some of them were involved in the use or distribution of these items. Accordingly, it leaves the people living in the Khanuy Valley very much as participants of some kind in a society with craft specialization linked to metallurgy.

6.3.2 Agriculture

As discussed in Chapter 5, artifactual evidence and plant remains recovered from flotation do not suggest that domesticated plants were being cultivated or processed in this region during Mongolia's Late Bronze Age—certainly nothing that would suggest a specialized type of production. And despite dubious claims for the "evidence" of agricultural production in some parts of Mongolia during the Bronze Age (see Chapter 5), increasing evidence suggests that agricultural activities of tangible scale did not develop in this region until the Iron Age/Xiongnu period when extensive agriculture is well attested for (Davidova 1995). Accordingly, until direct or more convincing evidence is shown (i.e. actual plant remains), the stone querns and so-called "hoe ring-weights" discovered in Bronze Age contexts by both Tsybiktarov (2003:83) and Erdenebaatar (2002:239) must be disregarded for the moment as evidence for agricultural production. To be sure, these implements could have also been used to process wild plants. There is therefore no concrete evidence yet in the Khanuy Valley, nor in Bronze Age Mongolia as a whole, for specialized economic production tied to the cultivation of domesticated plants.

6.3.3 Ceramic Technology

Despite the apparent absence of the above markers of specialization in domestic contexts, the ubiquitous presence of ceramics in the research area provides another way of evaluating craft specialization. Indeed, in terms of ceramic production, certain operations are essential while others are not. Those that are essential are those that are directly linked to the stages of fabrication (extraction of various materials, preparation, forming, and firing). The non-essential operations are those that do not usually affect the use of the product (i.e. form [although it is often defined by use] and decoration). The latter, because of its possible link to differences in social status, has already been discussed above. Here, the focus is put on evaluating technological variability as a possible marker of craft specialization.

When analyzing ceramics, a quasi infinite number of variables can be recorded. These in turn can also be examined with various degrees of precision. As the primary concern here is to evaluate the possibility of specialized activities (often reflected in the 'uniformity' or 'homogeneity' of production [Rice 1996:179]) during the Late Bronze Age, the focus was put on attributes that could be the most variable. Technological variability results from the choices carried out by the manufacturer and/or is the result of a plurality of manufacturers. With specialization, we expect, to some degree, more uniform, regular and homogeneous production since it is assumed that specialists—even part-time specialists—will create objects that are more standardized than those produced within a part-time low scale domestic context (Rice 1981). Late Bronze Age ceramics are characterized, as far as we know, by a general low degree of variability in the techniques of decoration and vessel shapes (see Chapter 1). According to Shepard (1965), however, many times diversity of paste within a type calls to our attention differences in style that otherwise pass unnoticed. For this reason, detailed attention was given to

the analysis of paste and the variables linked to the techniques of production and firing (Rice 1987; Sinopoli 1991).

Due to the fact that most potsherds could not be associated with a particular vessel type, specialization is evaluated here by testing for *overall* homogeneity in production and the possibility of outliers that may be indicative of variability. Two observations were thus made on the physical features of some of the more diagnostic sherds from our collection, that is, paste coarseness and firing atmosphere. Despite the fact that most sherds could not be associated with particular types of vessels, wall thickness was also examined in order to further evaluate the degree of variation. Manufacturing methods in which paste composition and firing behavior are fairly uniform would indicate the possibility of some scale of specialized production, while the lack of uniformity would be indicative of non-specialized production.

6.3.3.1 Ceramic Paste

Starting from a fresh cross-section break, a surface of 1 cm^2 was systematically examined using a 10x magnifying glass, a geological standard. Measurements taken from a fresh break tend to be more exact since the paste is less likely to have been affected by dirt and/or altered due to post-depositional factors. The size of inclusions, and thus the relative coarseness of Late Bronze Age ceramics, was evaluated using a digital caliper, and the results were divided into three categories according to the size of inclusions: fine (< 0.25 mm), medium-sized (0.25 to 0.50 mm) and coarse (> 0.50 mm). This classification by size of inclusion is based on geological investigations (Krumbein and Pettijohn 1938 [summarized in Echallier 1984; Rice 1987; Shepard 1965]). The majority of ceramic pastes comprised inclusions of various sizes. In order to avoid exceptional cases, such as only one coarse inclusion in a fine pottery, we chose to measure the third largest inclusion in order to ensure a relatively accurate representation of the observation. “Good

judgment", of course, was the most determining factor so as to make sure that the category allotted to a paste was indeed representative.

Keeping in mind that Late Bronze Age ceramics in Mongolia are characteristically all fairly coarse in nature (e.g. only three sherds from three different occupation areas in our whole collection had finer pastes), the high amount of variation in ceramic pastes observed in Figure 6.7 argues against specialization (but see Arnold 2000). It may be that this variation in paste "recipe" has to do with specific vessel types, but despite the upward skewness and the presence of a few outside values the stem and leaf plot in Figure 6.8 suggests an overall fairly single-peaked batch of inclusion sizes—not what you would expect if there was a particular relationship between particular paste "recipes" and different types of vessels (i.e. if two or more separate things were going on). Further mathematical transformation for correcting for this upward skewness (Drennan 1996: Chapter 5), while retaining a couple of outliers, further confirms the essentially single-peaked and symmetrical nature of this batch (Figure 6.9). That is, there are no distinct and separate bunches that could indicate that specific categories of pastes would be related to distinct types of wares—especially along the lines of the three categories of inclusion sizes discussed above and illustrated in Figure 6.7. Therefore, it is probable that taken together these two analyses of the same material reflect instead an overall high amount of variation in paste coarseness (reflected in the bar chart below and in the elongated Stem and Leaf plot in Figure 6.9), a usually telltale indicator of a type of production that is non-specialized.

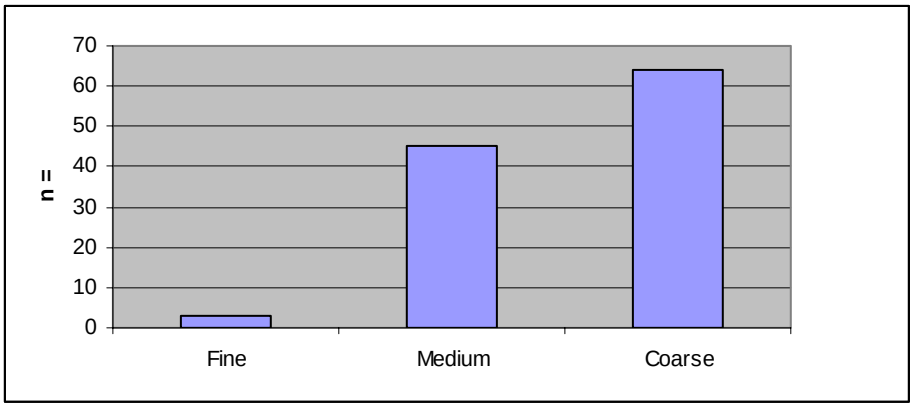

Figure 6.7 Relative coarseness of Late Bronze Age ceramic pastes (Fine: < 0.25mm; Med.: 0.25 to 0.50mm; Coarse: > 0.50mm).

Number of Cases	113
Minimum	2
Maximum	20
Median	5.4

```
          2   046678899
          3 H 0011122345556667778 99
          4   2222233344555667889
          5 M 2222233455567788
          6   00123355566679
          7 H 0014444577
          8   1556
          9   115
         10   01288
         11   23457
         12   14
* * * Outside Values * * *
         13   056
         18   3
         20   0
```

Figure 6.8 Stem and Leaf plot of inclusion sizes in Late Bronze Age ceramics.

Number of Cases	113
Minimum	-6.9
Maximum	3.0
Median	-2.68

```
      -6   9
      -6   1
      -5   88655
      -5   3322000
      -4   9986555
      -4 H 444333200
      -3 H 7777766655
      -3   444332110
      -2 M 888887765555
      -2   4433221000
      -1   8888887655
      -1 H 43333211
      -0   9776
      -0   442
       0   000334
       0   556689
       1   133
       1
       2
       2   6
* * * Outside Values * * *
       3   0
```

Figure 6.9 Transformed Stem and Leaf plot using Log10(x) to correct for the upward skewness observed in the Stem and Leaf plot in figure 6.8 above.

6.3.3.2 Firing Atmosphere

The firing stage of pottery making is in many ways the most crucial since "it tests the soundness of the potter's work" (Shepard 1965:213). It is also during this stage of manufacture that losses are the most important. And as indicated by Rye: "The principal variables controlled by the potter during firing are the rate of heating, the maximum temperature, and the atmosphere surrounding the objects" (Rye 1981:25; also see Rice 1987:80). The conscientious producer can therefore act directly on the type of firing of his or her vessels, and we expect specialists to be

especially attentive to this since specific firing conditions can also affect the mechanical resistance and thermal quality of vessels (Rice 1987:228). Of interest here is the fact that the firing atmosphere has a significant effect on the color of the ceramic paste. These colors can thus indicate the consistency with which the potters prepared and fired the vessels. Consequently, here too we can expect more homogeneity from a more specialized type of production than from an unspecialized household mode of production.

Firing atmosphere was also determined from the cross-section break. A fresh break allows for a better visibility of the paste and also makes it possible to note the chromatic variations due to various types of firing atmospheres. Color varies according to the total or partial oxidation of the paste (Orton et al. 1993; Rye 1981; Sinopoli 1991), and variations are always linked to a type of firing atmosphere that is more or less oxidizing or reducing.

From the two principal firing atmospheres which one can obtain under normal conditions (a neutral atmosphere, almost non-existent, is not considered here), three general chromatic variations of the paste could be observed on the pottery sherds from our collection: 1) Oxidized, 2) Partially Oxidized, and 3) Unoxidized (reduced). If the supply in oxygen exceeds what is necessary to consume the fuel, the firing atmosphere will be oxidizing. That is, once the carbon matter disappears from the paste, oxygen will affect iron oxides and oxidize the paste, giving it bright colors, often of reds or oranges. If the firing atmosphere is limited in oxygen, then we speak of a reducing (or 'unoxidizing') atmosphere. The same reduced oxides will then produce a gray to black coloring of the paste (Echallier 1984:21). A partial or incomplete oxidation will produce a "core" distinct in color (often gray or black) from the surface and subsurface zones (Rye 1981:114-118).

Although it was impossible to determine the type of vessel from which most of the sherds came, the overall variability in firing atmospheres suggest non-homogeneous firing conditions (Figure 6.10). Indeed, the high incidence of incomplete or partly oxidized ceramics (>34%) suggests uneven (non-specialized) firing conditions. The fact that the subsequent Iron Age Xiongnu were able to attain much better products and greater evenness in firing conditions using both the same clay sources and the same standard "recipe" for pottery making as the Late Bronze Age people (Hall et al. 1999) suggests that it is not the material itself that was poor, but that less technical excellence characterized pottery making in the Late Bronze Age. Almost all analyzed ceramics are of the low-, unevenly-fired coarse grained type that is apparently characteristic of the Late Bronze Age in Mongolia. Even the unoxidized (i.e. gray/black in color) sherds in the assemblage—a characteristic usually associated with the subsequent finer paste Xiongnu pottery—are all coarse grained.

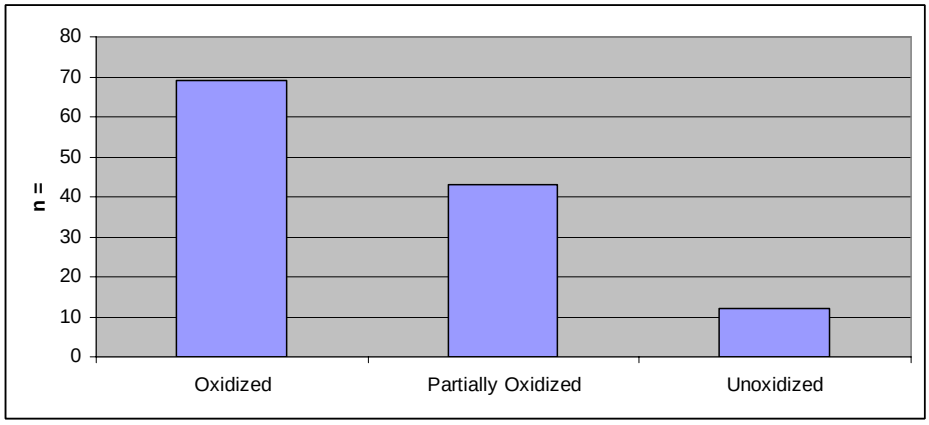

Figure 6.10 Firing atmospheres of Late Bronze Age ceramics.

6.3.3.3 Wall Thickness

Wall thickness is often retained as a criterion in pottery analysis so as to evaluate the degree of uniformity in production. Of course homogeneity in wall thickness would only be expected amongst similar vessel types in a specialized mode of production context. However, due to the small size of most of the ceramic material, once again, it was impossible in most cases to evaluate from what vessel type a particular sherd came. Consequently, the relative characterization of wall thickness presented here must only be considered as a broad additional tool for examining the degree of homogeneity, the possibility of patterns, and investigate, if present, possible outliers.

While not indicating craft specialization, the analysis of wall thicknesses, when taken together with previous data, does suggest an interesting pattern. The stem and leaf plot of the measurements (in mm) of the walls of Late Bronze Age ceramic sherds suggest that the shape of this batch is roughly single-peaked and symmetrical, at least as much as it is reasonable to expect in a sample this small (Figure 6.11). There are, however, three outlier values, two of which suggest slightly thicker bodies than the majority of sherds, and only one that suggests a vessel with much thinner walls than the rest (i.e. 2.8 mm). The latter is probably much more meaningful than the two other outliers since it is usually technically more difficult to produce such thin earthenware. Nevertheless, both one of the thickest walled sherd and the especially thin-walled vessel fragment come from the same occupation area where a larger proportion of decorated ceramics, larger vessel forms and a 'foreign' vessel type have been found (i.e. SP07E-SOV—see above). While this does not reasonably suggest any kind of specialized ceramic production at this site, it does add weight to the idea that something a bit different was happening at the SP07E-SOV occupation area.

```
          2   8
* * * Outside Values * * *
          7   012
          7   799
          8   1222
          8   799
          9 H 2334
          9   689
         10   12234
         10 M 5566789
         11   1234
         11   5577789
         12 H 0112
         12   5689
         13   044
         13   67
         14
         14   9
         15   4
* * * Outside Values * * *
         17   1
         18   4
```

Figure 6.11 Stem and leaf plot of wall thicknesses (in mm).

In sum, there is no evidence for specialized pottery production during the Late Bronze Age. No kilns, wasters, evidence of wheel use or pottery-making tools were found, and despite one fine-paste thin-walled vessel no particularly high quality ceramics were present in any of the assemblages. Similarly, the analysis of the physical features (paste types, firing atmosphere, and wall thickness) of some of the most diagnostic sherds from our collection did not reveal any evidence of homogeneity, a characteristic that might have been indicative of some level of craft specialization. Consequently, it is highly likely that the scale and type of ceramic production during the Late Bronze Age was an unspecialized type of household mode of production (Peacock 1982; Rice 1987; van der Leeuw 1977). That is, manufacture was probably occasional

and intended primarily for the makers' family's own use, although the aforementioned larger and 'fancier' wares could have also been used in feasting activities.

The only exception to all this is the single sherd found at the SP07E-SOV occupation area which has much thinner walls than the rest. As a single outlier, however, it is difficult to relate this to any form a specialized production in the research area. The sherd may simply be related to a vessel type that is foreign to the Khanuy Valley—just as other sherds that have been found at the same occupation area (see section 6.2). Whether some form of specialized ceramic production exists somewhere else remains to be discovered and demonstrated. Right now, these few particular sherds only suggest possible contact with other, probably northerly regions of Mongolia. And while these sherds are distinct in the Khanuy Valley research area, they are not necessarily the product of specialized production elsewhere.

6.3.4 Stone Tool Production

The aim in analyzing the lithic material is not to present a detailed and exhaustive study of lithic technology, but rather to present data that can shed further light on the nature of activities that may have been going on at the different occupation areas in the Khanuy Valley during the Late Bronze Age, and whether there is any variability in these activities between sites. Notably, the objective is to investigate whether there is any evidence for specialized activities (e.g. tool production) during this time period.

Save for one occupation area (SP11W-SAL) that will be discussed in detail below, little evidence of stone tool production has been discovered in the research area. In fact, very little lithic material has been uncovered in general. In the Khanuy Valley, only ten lithics (nine small flakes [< 3 cm in width] and one whetstone, all made from locally available material, have been found in total within secure Late Bronze Age contexts. This is surprising since while he has

found no evidence for specialized lithic production sites, Wright (2006) has identified large amounts of lithic artifacts in the Egiin Gol Valley, a region just north of the Khanuy Valley. This is important because Wright has suggested that in part because *khirigsuur* monuments are sometimes associated with microlithic technology, these are not Bronze Age monuments, but must pre-date the Bronze Age. Consequently, he associates these monuments with Epipaleolithic (Mesolithic) pre-pastoral hunter-gatherers (Wright 2006:199-265). This is very different from what is encountered in the Khanuy Valley and elsewhere where an increasing number of dates pinpoint the *khirigsuur* phenomenon to the Late Bronze Age (Allard and Erdenebaatar 2005; Fitzhugh 2009; Frohlich, personal communication) and where comparatively little lithic material has been found. In addition, as discussed in Chapter 5, the faunal record does argue against a primordially hunter-gatherer subsistence strategy for this period of time. Finally, there is no reason why microlithic technology should be solely the hallmark of Mesolithic hunter-gatherers. To be sure, such technology in the Eurasian steppes (see for example *Sintashta* Culture contexts) is well known to have persisted well into the Bronze Age, including, noteworthily, in Mongolia (Wright 2006:273, 280).

That being said, there are two occupation areas that still merit attention. First, of the nine lithic flakes that have been found from secure Late Bronze Age contexts, it is interesting that the majority (n=5) have been discovered at SP07E-SOV—the occupation area that stood out in particular in terms of ceramics (see above). In order to further evaluate this difference a density comparison between occupation areas that have produced lithic material was accomplished using a lithic/sherd ratio (i.e. the number of stone artifacts divided by the number of sherds). In relative terms, the larger the index number, the more important this category of artifact was at a particular occupation area. Table 6.1 shows that of the four occupation areas where lithics were

discovered in secure Late Bronze Age contexts SP07E-SOV does indeed have one of the highest indexes, thus highlighting the relative importance of this particular category of artifact at this occupation area. However, the samples are so small that we cannot have much statistical confidence that there is much difference between the proportions of lithics (lithics as a proportion of the total number of lithics and sherds) between these four occupation areas (Figure 6.12). Accordingly, while lithic production seems to be limited to only four occupation areas within the research area, there does not seem to be any differences that would suggest that SP07E-SOV was different from the others.

Table 6.1 Lithic to sherd ratio.

SITE	LITHIC / SHERD	RATIO INDEX
WFA	1 / 44	0.02
MAC	3 / 61	0.05
JUL	1 / 137	0.007
SOV	5 / 133	0.04

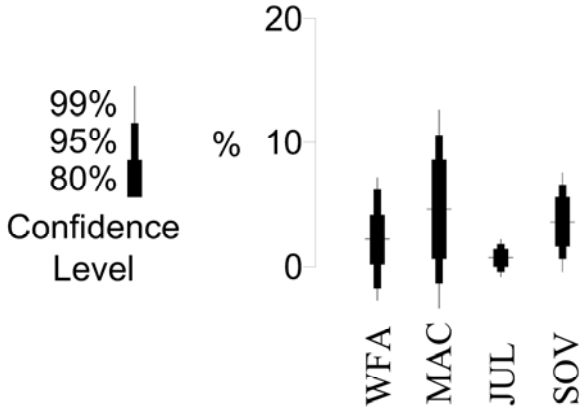

Figure 6.12 Proportion of lithic flakes per occupation areas with lithic material.

Despite this, the cumulative evidence from both ceramics and lithics implies that this occupation area (SP07E-SOV) witnessed greater diversity of activities compared to the other occupation areas in the Khanuy Valley research region. The fact that this occupation area produced very little faunal remains—none of which could be securely associated with Late Bronze Age contexts only (see Chapter 5)—further suggests that the inhabitants of this occupation area may have been dedicated to activities other than herding, thus characterizing them as *specializing* in other activities. This occupation area has also been identified as having the best indications of higher status and possibly long-distance connections. Accordingly, this suggests that higher status people occupied this site and possibly gained their distinct status via a combination of long-distance connections and specialized economic activities—even though the latter may not have been restricted in nature. Obviously, we are not talking about trade caravans, factories, and kings here, but we are seeing at least some of the kinds of things that have been identified as possibly indicating incipient status differences and small-scale specialization.

The other occupation area that was mentioned above and that stands out in terms of lithic material is SP11W-SAL. This occupation area is located the closest to both a *khirigsuur* and a major deer stone site, as well as to numerous 'slope' burials in Zone B. Similarly to SP07E-SOV, this occupation area revealed very few faunal remains in general and none that could be confidently associated with Late Bronze Age contexts only (see Chapter 5). Of particular interest, however, is the fact that this site is the only one where a fairly large number of stone artifacts were found (n=23). This number is especially significant since it represents 41.8% of all artifacts recovered from this occupation area. This proportion (lithics as a proportion of the total number of lithics and sherds) is also significantly higher than the proportion of stone artifacts found at the other occupation areas, and we can have high statistical confidence in this

observation (Figure 6.13). Unfortunately, despite the fact that these lithics were found in conjunction with Bronze Age ceramics, these were all fortuitously found on the ground surface and no lithic material was discovered in any of the excavated units, thus not allowing them to be discussed on the basis of secure contexts. In spite of this, their relatively close association with Bronze Age ceramics must be taken as indication that they probably belong to this time period and thus they warrant at least a cursory analysis.

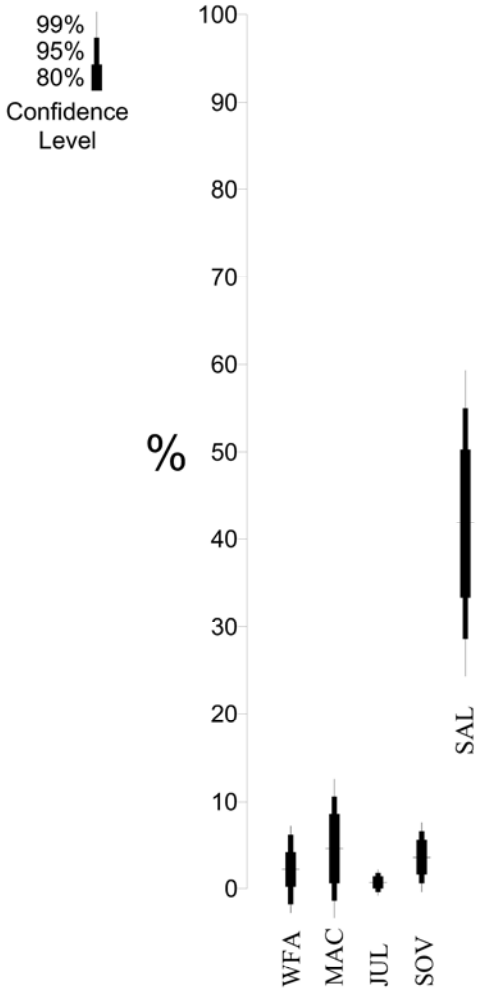

Figure 6.13 Proportion of lithic material per occupation area, including SP11W-SAL.

All of the lithic material recovered at this occupation area was chipped stone artifacts (Figure 6.14). None were ground stone tools. In fact, the bulk of the material was unmodified debitage and cores (87%), and despite the presence of two small blades (ca. 3 cm in length) no other formal tool types were found. All the material except for one quartz flake is locally available fine grained grey or black metasedimentary rock and probably comes from one of the nearby riverbeds where such material is also found (cf. Wright 2006:184 for a similar situation just north of our research region). Certainly, the overwhelming percentage of macro-debitage and cores at this occupation area reinforces the idea of a local procurement area. The large proportion of debitage (>65%) also indicates that the people using this occupation area were invested in core reduction and possibly in initial tool production, not consumption. That is, most of this debitage material included primary flakes, macro-flakes and other pieces that included cortex. The fact that this is the only occupation area were such lithic artifacts have been found also highlights it as the primary, if not the only, locus of production in the research area.

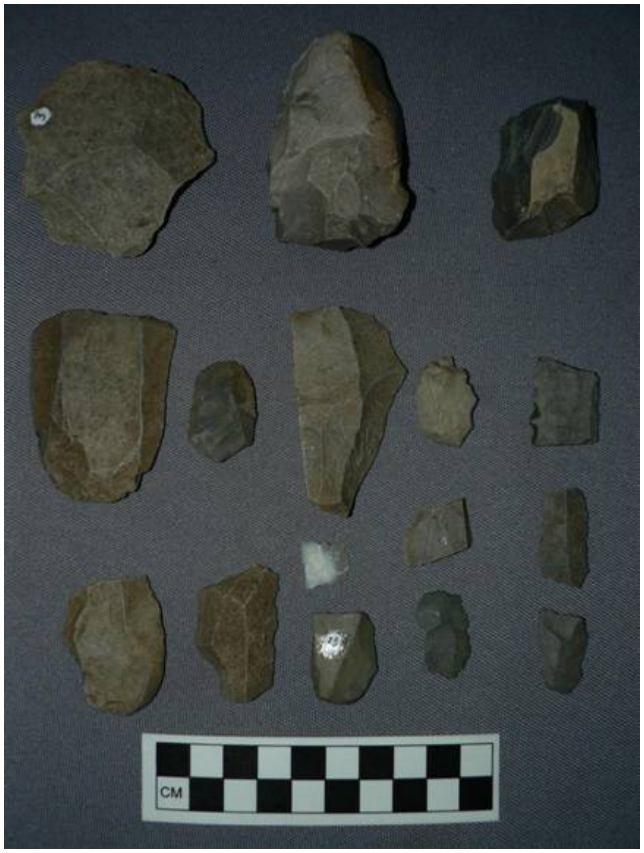

Figure 6.14 Sample of lithics from SP11W-SAL.

As was the case for SOV, it is difficult to know just what to make of this site. The high population index for this occupation area based and the area/sherd density index presented in Chapter 3 suggests that this was not just a periodic campsite where people only came to make their own lithics. This is also supported by the fact that the lithic material that was used is not restricted to this particular area and that it is available throughout the research area. There is thus no particular reason linked to the availability of the lithic material that would explain why the production of lithics would only be concentrated at this particular occupation area. What this does suggest—and this is supported by the apparently very low incidence of faunal remains at this site (see Chapter 5)—is that the inhabitants of this occupation area may have been dedicated

to activities other than herding, apparently making lithics as a specialized activity. The fact that no finished tools have been found in the research area also suggests the possibly that the lithic items were traded outside of the research area. The implications of all of this are puzzling, but interesting. Indeed, since the lithic material is not restricted in nature, then it means that lithic production may have been regarded as a 'specialized' (or at least special) activity. Lithic production was certainly extremely restricted in scope. That is, although everybody in the Khanuy Valley had access to the raw material, only a select few were actually producing lithics to any extent. The lack of evidence for herding at this occupation area (despite its high population index—see Chapter 3) compared to most of the others in the research area also suggests that these people must have been producing these lithics in exchange for something else—possibly food. Accordingly, the inhabitants of this occupation area must have been recognized by the local population as lithic 'specialists' of some kind.

6.4 SUMMARY

The analyses presented in this chapter suggest that there do seem to be some small differences in status between occupation areas. The clearest evidence of this comes from ceramics, notably the differential proportion of decorated ones. Indeed, three to four occupation areas have much higher percentages of decorated ceramics than the rest of the investigated sites in the research area. Interestingly, three of these four occupation areas are located in proximity to *khirigsuurs*, two in Zone A and one in Zone B. SP07E-SOV is the notable exception to this, although a single deer stone is located near this site. In addition, two of the three occupation areas where the only cattle remains were discovered (see Chapter 5) also correspond to the two sites in Zone A where

higher proportions of decorated ceramics were found. Thus, there does seem to be some relation between social status and proximity to monumental structures, the exception being SP07E-SOV, once again.

Indeed, SP07E-SOV is singular in terms of having revealed comparatively numerous markers of status despite the fact that this occupation area is not spatially associated with *khirigsuurs* or other Late Bronze Age burials. To be sure, ceramic analysis suggests fairly notable differences in proportion of decorated ceramics, with this site having amongst the highest proportion of them. Additional evidence for the distinctive nature of this occupation area is also provided by the occurrence of larger vessels and the presence of the only foreign vessel types (suggesting long-distance ties). In fact, based on this cumulative evidence, SP07E-SOV is actually the occupation area that stands out the most in terms of markers of status differences. As noted above, however, the fact that this occupation area is not spatially associated with *khirigsuurs* makes the relationship between higher status and proximity to monumental structures uncertain. Of course, a lack of immediate proximity to these monuments does not necessarily demonstrate a lack of involvement in their construction and management, but the link is not obvious.

The analyses presented in this chapter also suggest some modest form of economic specialization (or economic emphasis) based on lithic production during the Late Bronze Age. The quasi-absence of any finished tools and the large proportion of debitage which includes primary flakes, macro-flakes and other pieces with cortex indicates that the people using the SP11W-SAL occupation area were invested in core reduction and possibly in initial tool production, not consumption. The fact that SP11W-SAL is the only occupation area where such lithic artifacts have been found also highlights it as the primary, if not the only, locus of

production in the research area and thus suggests localized production. This is especially relevant that the raw material is ubiquitously available. Accordingly, the inhabitants of this occupation area must have been recognized by the local population as lithic ‘specialists’. Oddly enough, however, no finished tools have been found in any of the investigated occupation areas within the research area. This might signify that stone tools were traded outside the community.

7.0 CONCLUSIONS

The general aim of this study was to investigate the *early* development of societal complexity in Mongolia during the Late Bronze Age and address the nature of the social and economic organization of these societies during this pivotal period in Mongolian history. Concretely, this archaeological study in the Khanuy River Valley region of north-central Mongolia aimed at evaluating the 'dependency' hypothesis of sociopolitical development among mobile pastoralists. In order to accomplish this, a number of concrete lines of inquiry have been investigated in this study so as to systematically and empirically evaluate the core variables and problematic aspects related to the development of 'nomadic' polities (i.e. those stated in the dependency hypothesis), namely demography, subsistence, mobility, and political economy in relation to higher degrees of sociopolitical organizations.

In this final chapter I will: 1) summarize the results of this study and discuss some of the most important implications of these results, 2) present a concluding hypothesis regarding societal complexity during the Late Bronze Age in the Khanuy Valley region of central Mongolia and 3) outline some remaining questions that require further investigation.

7.1 THE RESULTS OF THE CURRENT STUDY

The results of the present study suggest that a certain level of societal complexity was already present among mobile pastoralists in the Khanuy River Valley region of central Mongolia during the Late Bronze Age—a region far from centers of power, population, and trade (cf. Salzman 2004:29) and at a time before regular interaction with large sedentary states in China existed (cf. Kradin 2002). The importance of the findings of this study is manifold and upends many of the assumptions tied to the 'dependency' hypothesis and the early origins for Mongolian societal complexity.

First, the type of herding implied by both the settlement pattern study and the analysis of the faunal material suggest a fixed and highly restricted form of seasonal migration, with fairly permanent camp-grounds, but no permanent dwellings (cf. Vainshtein 1980:95). In fact, although it does seem as though the Late Bronze Age inhabitants of the Khanuy Valley did practice some form of transhumant mode of mobility, their settlement system indicates that they probably did not move more than a few kilometers from one seasonal campsite to another. Moreover, there is clear evidence for demographic centralization in the environs of monumental structures during the Late Bronze Age as the total density-area index for Zone A (located at the center of an important cluster of monumental structures) is twice as high as the one in Zone B (which corresponds to an area that is the tail end of a cluster of monumental sites, as well as part of an area that comprises neither burials nor *khirigsuurs*, i.e. a "buffer zone"). Consequently, contrary to the expectations of the dependency hypothesis, pastoralist mobility does not necessarily preclude centralization.

While at first it may seem difficult to reconcile the apparent lack of evidence for permanent occupation implied by the lack of any architectural remains with the indicators of restricted mobility provided by the settlement pattern and the faunal remains, the type of mobile herding described above is exactly analogous to what still prevails today in the research area, that is, herders move lock, stock and barrel (and their habitation!) from one seasonal campsite to another over generally very short distances between the foothills and the river—usually no more than a few kilometers. And despite the stability and fixedness of their campsite locations, especially their winter ones, present day herders in the valley still do not build permanent habitation structures except for their animals at winter campsite locations!

With good reason, much has been said about the significance and importance of recognizing residential flexibility among mobile pastoralists (e.g. Frachetti 2004; Hanks 2003), but Cribb's note on overlapping characteristics between "nomad" and "sedentary" dwelling types and material culture must also be taken into consideration (1991:149-155). It is possible, just as it is the case today in Mongolia and elsewhere (Cribb 1991:154; Howell-Meurs 2001:322), to use 'simple', portable types of dwellings such as *gers* (traditional Mongolian tent houses) as 'permanent'(and sometimes 'fixed') habitations. Even today complexes of *gers* make up whole districts in cities all over Mongolia, including the capital city Ulaanbaatar. Accordingly, in this context and as a cautionary note, architectural remains (or lack thereof) may provide a poor indicator of the degree of "sedentariness". These words of caution should also be considered when devising pedestrian survey programs designed to identify and differentiate 'nomadic' and 'sedentary' settlements on the basis of architectural remains (or lack thereof) and artifact types alone. That is, while a lack of architectural remains may indeed be a good indication of mobility—or more accurately, the *possibility* of mobility—, it provides very little in terms of

understanding the actual settlement system, which can be highly restricted (almost sedentary-like) in scope as is the case in the Khanuy Valley during the Late Bronze Age. In other words, it is possible that no fixed/permanent structures will ever be found at the Late Bronze Age occupation areas discussed in this thesis (although soil studies and geochemical investigations may eventually detect anthropogenic features and locations where animal shelters or corrals once stood), even though their inhabitants seem to have practiced a highly restricted form of mobile pastoralism. Of course, this does not imply that part of the population (human and animal) did not occasionally move over greater distances. This is even probable, especially when one considers the pan-regional similarities in ritual and burial structures. What this underscores is the importance of approaching the issues of mobility and subsistence patterns with caution and the need to reevaluate (i.e. TEST) archaeologically these issues instead of simply associating certain types of monuments (i.e. kurgan-like structures) and particular faunal assemblages with prescribed, but confusing and mostly unhelpful, ethnographically derived socio-economic types such as *nomadic pastoralism, semi-nomadic pastoralism, semi-sedentary pastoralism, sedentary pastoralism,* etc. As Kelly (1992:60) rightly notes: "By deconstructing the concepts of mobility and sedentism, we see the need to construct more useful approaches than a simple polarization of mobile vs. sedentary societies". In fact, as Hanks (2003:69) predicted, "[the picture is slowly beginning] to take on a much more complex representation as more intensive, and scientifically comprehensive, approaches are undertaken to settlement site excavations focusing on the Late Bronze Age to Early Iron Age period (ca. 1200 – 800 BC)." And indeed, a mosaic of varying patterns of pastoralism and mobility respective of particular environmental niches is slowly coming to light (e.g. Chang et al. 2002; Frachetti 2004; this study).

Second, the pastoral mode of subsistence described in Chapter 5 seems to have been self-sufficient and not as spatially extensive and unstable as the dependency hypothesis predicts for "nomads" who exploit "marginal" environments. In fact, despite the apparent absence of complementary subsistence practices such as agriculture, plant cultivation or intense use of wild fauna during this period of time, resources (domestic animals and thus pasture) seem to have been reliable, predictable, and abundant enough in the region to sustain a fairly large group of centrally located humans and animals who built impressive monuments for a period of well over 500 years (cf. Koryakova and Epimakhov 2007:211). Moreover, the astonishing number and continual deposit of animals at *khirigsuurs* (most probably linked to feasting activities) for this long period of time calls into question the idea that pastoralism (even in its most "pure" form) is necessarily inhibitively unstable and not conducive to surplus production.

Third, the population estimates discussed in Chapter 3 suggest that during the Late Bronze Age the Khanuy Valley was very actively inhabited (in terms of density and/or intensity of occupation). In fact, the human and animal population estimates during the Late Bronze Age apparently approximate the present density of people and animals per square kilometer in the research area—a density that today approaches and even surpasses during the winter months the perceived carrying capacity of the research area (see Chapter 1). While this population density is indeed overall fairly low, the Khanuy Valley research area does seem to have supported a rather important human and animal population—at least seasonally—, one that was large enough to build the numerous and fairly labor intensive monumental structures that dot the research area. Accordingly, the mobile pastoralist economy of the Late Bronze Age in the Khanuy Valley did not apparently necessarily entail very low population densities as the dependency hypothesis anticipates. Or at least, the population density was not so low that it would have inhibited

sociopolitical integration and demographic centralization. In fact, all this suggests a social organization whose workings are akin to settled and physically bounded communities.

Fourth, the analyses of domestic artifacts and faunal remains presented in Chapter 6 suggest that there does seem to be some level of social differentiation between occupation areas during the Late Bronze Age. Certainly, we are not talking about exceptionally lavish status markers: even the decorated ceramics are fairly ordinary! And in all probability, based on the artifactual material at least, the Late Bronze Age groups inhabiting the Khanuy Valley research area were probably relatively egalitarian compared to other known middle-range societies. But the fact that status markers were all found in greater number at one single site (SP07E-SOV) highlights the distinctive nature of this occupation area—one that suggests that its inhabitants had some distinctive form of social status (the exact nature of which is still unclear).

The analyses also suggest some modest form of economic specialization (or economic emphasis) based on lithic production during the Late Bronze Age. It also suggests that lithic production was centralized as the only evidence for significant lithic production was only found at one occupation area. And this is despite the fact that the raw lithic material that was used is ubiquitously available. However, the fact that economic specialization and status do not seem to correlate spatially suggests a rather horizontal, decentralized sociopolitical organization, possibly with multiple uncorrelated dimensions of differentiation.

In sum, there do seem to be some social and economic differences between occupation areas during the Late Bronze Age in the Khanuy Valley, but the types of status markers and the range of variability in activities between occupation areas speak of an overall low or limited degree of social differentiation. As for the nature of this social differentiation, the picture is still not totally clear. The ceramic evidence suggests that feasting might have been important (this is

also supported by what seems to be happening at *khirigsuurs*) and, in the case of SP07E-SOV and possibly SP26E-MAC, that possibly long-distance alliance building was also an important factor in status building. The proximity of some higher status campsites to monuments also seems to suggest the importance of ritual and ideology in defining status differences, but it does not seem to be exclusive in nature as 'lower-status' campsites are also located near *khirigsuurs*; and SP07E-SOV—the most distinctive in terms of status markers—is not spatially associated with *khirigsuurs* or other Late Bronze Age burials. It is, however, associated with a single nearby deer stone.

Regardless, what is apparent from all this is that in this case the expected correlates of the dependency hypothesis do not seem to stand up solidly to archaeological scrutiny and that the sociopolitical picture during Mongolia's Late Bronze Age is actually much more complex than hitherto thought. In fact, the results of this present study suggest that while clear social hierarchies have not been identified within domestic contexts, limited status differentiation and relatively complex forms of social organization among mobile pastoralists can indeed develop in remote regions far from centers of power. But ultimately this should not be surprising since several ethnographic examples, such as the North African Moors and Tuaregs (Bonte 1999), and the Rufa'a al-Hoi of Sudan (Johnson 1983), suggest that complex political institutions can and have indeed arisen without the influence, or at least the direct influence, of states. Archaeologically, it is also important to mention that such societies as those belonging to the Late Bronze Age Karasuk Culture (13th - 8th centuries BCE) in the Minusinsk Basin of Southern Siberia and those Early Iron Age groups associated with the Arzhan I and II barrows (9th - 8th centuries BCE) in Tuva have also clearly developed highly complex hierarchical institutions and

hereditary status differentiation in the absence of interaction with neighboring sedentary states (Askarov et al. 1992; Gryaznov 1969, 1980; Legrand 2006).

In light of all this, the results of this study are important to consider as they have significant implications for our understanding of the dynamics of social change in this region of the world. Indeed, the conventional wisdom has it that at the beginning of the Bronze Age the people inhabiting Mongolia and adjacent regions had commenced a transformation from a sedentary, agricultural subsistence strategy to "nomadic" (i.e. long-range) pastoralism, and that this transition was completed by about 900 BCE (e.g. Koryakova and Epimakhov 2007:211). Different causes have been proposed to explain this drastic change, the most common one being linked to climatic changes, which in turn would have set off mass westward migrations and changes in basic economic activities (e.g. Kurochkin 1994, cited in Koryakova and Epimakhov 2007:211). What this study indicates, however, is that beyond the now established fact that this region of central Mongolia during this period of time did not witness any particularly important ecological stress—at least nothing different from what present-day herders are faced with—this period actually corresponds to a time when pastoralist mobility in central Mongolia was apparently fairly restricted in scope and to a period when subsistence practices, despite the absence of agriculture, were apparently sufficiently productive to sustain a fairly centralized social organization that built impressive stone monuments that required a fairly large and sustained input of both manpower and animals for a period of well over 500 years. This was also accomplished centuries before regular interaction with large sedentary states such as those found in China at the time and before the appearance of the first state-like nomadic polity in this region.

So what does all this mean in terms of social organization? And how do we give meaning to this type of society that, nevertheless, has both the ability to create complex ritual/mortuary megalithic structures and the need to do so?

7.2 CONCLUDING HYPOTHESIS: 'SOCIALLY INTEGRATIVE FACILITIES' AND THE EMERGENCE OF SOCIETAL COMPLEXITY ON THE MONGOLIAN STEPPE

In non-stratified societies, order often depends more on integration and cooperation than on force; and rituals – especially above the household level – are often essential to social integration (Hegmon 1989; Netting 1972). To the extent that rituals are conducted in a built environment, then architecture plays an important role in the ritual and thus in social integration. Substantial public works, ritual ones in particular, have been shown to serve such 'integrative' functions (Adler 1989; Hegmon 1989). Because architecture used for ritual purposes is often built by the shared labor of those who will use them, architecture may help to define groups of individuals and contribute to the integration of these individuals into a social group or community. As suggested by Hegmon, "architecture contributes to integration by defining [group and territorial] boundaries and by symbolically reinforcing ideology and social norms" (1989:7, 9). As such, the scale and labor required to build substantial public works that require unusual construction investments, such as *khirigsuurs*, can be indicative of the scale and extent of community integration. On the basis of the scale of some *khirigsuurs*, as well as the required labor to build them and the number of animal deposits, social integration in the Khanuy Valley probably far exceed the immediate community surrounding these monuments.

However, although *khirigsuurs* are quite homogeneous across vast regions, there is some variability in design (Tsybiktarov 1995; Wright 2006). It is presumed therefore that *khirigsuurs*

were not built under the auspices of a macro-regional-level authority. This has important implications for understanding the spatial arrangement of habitation sites and monuments, because *khirigsuurs* and their placement may be seen as products of local decision-making within a common standardized pan-regional ideological system that included religious ideas. In fact, especially within a mobile pastoralist system, this sort of purposeful planning at the local level suggests substantial efforts at maintaining an integrated community that went beyond the immediate locale and existed in the absence of everyday face-to-face interaction. The locales would have had a unifying effect, therefore providing, if not the shared experience of a central communal place, a familiar experience that both reflected cultural and social cohesion and reinforced it. This may well have been a very important aspect of social integration and centralization. Mobile pastoralists are potentially highly segmentary, and social as well as political integration depends on the existence of social groupings that crosscut other social segments. The shared use of *khirigsuurs* may have contributed to social integration by discouraging social segmentation. Certainly, *khirigsuurs* likely served several purposes, some of which may have been more important for some members participating in the ceremonial events than for others. Feasting, community integration, and possibly even aggrandizement are all possible functions, perhaps all working at the same time through the events associated with their construction. The action of *khirigsuur* construction, especially in the form of adding to an already existing composition, may also have made statements of group power, ancestry, and alliances. Yet, along with these group-oriented integrative activities, there is also some visible emphasis on symbolism relating to individuals (such as single interments in the central mound of some *khirigsuurs*, deer stone imagery and eventually "warrior-elite" slab burials). There is also evidence for some social and economic distinctions between occupation areas (see above and

Chapter 6). The presence of both group-oriented and individualistic symbolism—maybe related to both achieved and ascribed status—has been documented in many 'transegalitarian' societies, and may reflect a transitory situation in which a system of hereditary status and a class of chiefs are not yet firmly established. Mortuary display, for one, could even be at its greatest when the concept of inheritance is accepted, but when there is still some uncertainty in the attribution of relative status positions within society (Cannon 1989; Randsborg 1982; Schulting 1995).

In conclusion, this seemingly paradoxical situation is very interesting and important for understanding the nature and development of societal complexity in this region, since it seems to actually signify the first stage in the emergence of political organization operating beyond the descent group (Clark and Blake 1994; Hayden 1995; Parkinson 2002:2). It also seems to reflect differential (possibly even hierarchical) social relations based on the control of nonmaterial resources (such as ritual-based polities) rather than hierarchical social relations based on economic variables (McIntosh 1999; Potter 2000), although we can not rule out the importance of differential numbers and types of animals as economic, and by extension, status markers. Regardless, ritual apparently played a significant role in supra-local community integration, in the maintenance of large group size, and in the emergence of societal complexity. In fact, the differences in the size, number of animal deposits and above-ground elaborateness of *khirigsuurs* suggest that competition between individuals or groups within a cluster of occupation areas was carried out through ritual (see for example Figure 1.4). Possibly communal rituals were the principal means of gaining and maintaining status positions and prestige (Clark and Blake 1994; Hayden 1995). In other words, it appears that some of the foundations of Early Iron Age complex sociopolitical organization were already being laid locally during the Late Bronze Age,

even though it is possible that "real" chiefship (i.e. more powerful forms of leadership) arose only after confrontation with powerful external polities such as early imperial China.

7.3 EPILOGUE: THE LATE BRONZE AGE IN THE LONGER TRAJECTORY

Khanuy Valley sites, including settlements and the large *Gol Mod 2* 'royal' cemetery (Allard et al. 2002; Miller et al. 2006), indicate that the valley was integrated at some point into the Xiongnu regional polity. As discussed in Chapter 1, numerous scholars have argued that without regular interaction with already-existing agricultural state-level societies the major problem for the development of such a complex regional polity was its under-developed productive base and its highly mobile population capable of fission and mounting significant factional challenges. What this study has shown, however, is that these possible 'impediments' were either inexistent (or not necessarily as hindering as commonly believed—such as the case with the subsistence base) or were already being dealt with independently during the previous Bronze Age. Certainly, during the Iron Age Xiongnu period there is historical and archaeological evidence for productive interaction with neighboring states in China and elsewhere and that long-distance trade and tribute extraction were important in the further development of the Xiongnu and subsequent states in this part of the world (Di Cosmo 1999; Hulsewé 1979:216-217; Jagchid and Symons 1989). However, as Honeychurch has recently underscored, "spatial reach must be matched by internal methods of centralized integration which together make-up vital aspects of the statecraft of any large scale political system" (Honeychurch 2004:239). And as suggested above and in this study, these centrally integrative principles (but combined with long-distance outreach) were apparently already strongly present during the Late Bronze Age, indicating that

some of what Di Cosmo (1999:7) has identified as "traditionary" institutions (the long-term repertoire of strategies by which steppe polities were organized and financed and which were retained and employed differentially over successive periods of regional organization) were actually already being laid locally during the Late Bronze Age. This 'centralizing mode of integration' is certainly a critical factor in any developing body of statecraft; but with its more dispersed mobile population which is more easily able to 'vote with its own feet', the above-mentioned communal and ritual mode of 'centralized integration' was most likely a crucial underpinning in the early development of the Xiongnu polity.

7.4 DIRECTIONS FOR FUTURE RESEARCH

This study has provided a framework for evaluating the emergence of, as well as the degree and nature of, societal complexity during the Late Bronze Age in the Khanuy Valley region of central Mongolia. Moreover, this study has demonstrated the important contribution of settlement archaeology to this endeavor. Of course, this study needs to be considered as just the point of departure for what needs to be a sustained and wider-ranging multiscalar research enterprise as many unanswered questions still remain. This study has also generated a number of future research topics.

First, this study is the first of its kind in Mongolia and is based on only one of several settlement/monument clusters in Late Bronze Age Mongolia. The fact is that at the moment, the lack of comparative material and measurements from contemporaneous contexts is the biggest hamper to constructive comparative research. Despite this, the present study provides a model for future investigations of adjacent and more distant/peripheral regions of Mongolia. Indeed, it

is only through similar and comparative multiscalar work in various regions and in different environmental zones that we will eventually bring about a more complete picture of the development of complex societies among mobile pastoralists in this and other regions of the world. Indeed, this study together with similar research by Honeychurch and colleagues in the more northerly (forest-steppe) and southerly (desert-steppe) regions of central Mongolia have started to produce a much better understanding of regional social organization during the Bronze and Iron Age periods in different environmental locales. What is needed now are also similar types of studies in the more eastern and western parts of Mongolia where not only do present patterns of mobility based on particular environmental conditions vary more widely—including areas like in the Altai where ethno-historians have recorded less-tethered mobility patterns than that found in the Khanuy Valley, for example (Bazargur 2005)—, but where the concentration (and types) of Late Bronze Age monuments also vary greatly (see Figure 1.11 and 1.12). That being said, it would also be worth expanding on the area surveyed for this present study in order to better characterize the "buffer zones" of less dense monuments and occupation. This would allow for a better interpretation of centralization. For example, the faunal analysis presented in Chapter 5 confirms the domestic nature of the animals (including horses), but no direct evidence exists yet for this period until the Terminal Bronze Age (with the slab burial culture) for mounted pastoralism. Yet the distance between *khirigsuur* clusters is curiously the same distance that a horse can be comfortably ridden per day, that is, about 11-17 km (Sandra Olsen, personal communication) and corresponds to the distance between planned settlements in many places, including here in the American Northeast during the early 20th century when traveling between towns was done mainly by horse (Leila Inksetter, personal communication). If horses were indeed ridden during the Late Bronze Age in the Khanuy Valley, then the extent of the surveyed

area that included the "buffer zone" becomes essentially meaningless, even though the results of this study suggests that the intensity of occupation was apparently higher near the center of the *khirigsuur* cluster, and diminished farther from it. Nevertheless, expanding the survey area a few kilometers more could confirm this and provide more detailed information about the extent of demographic centralization. Fortunately, this would not necessitate another intensive shovel probing strategy, as the information gained from this present study could be used to sample with statistical confidence these other areas (see Drennan 1996:142-144).

Continued and increased multiscalar settlement pattern research in different regions of Mongolia and publication of the results of exhaustive quantitative and qualitative analyses of material remains from domestic contexts, including faunal remains, would thus greatly enhance efforts to compare the results of a given study to those of contemporaneous assemblages. In turn, this type of research could productively contribute to global comparative anthropological studies on the topic of social change in general by documenting variability in both the forms and developmental trajectories of societal complexity. To be sure, while middle-range societies have been effectively investigated through the comparative analysis of sedentary, agricultural-based societies around the world, such complexity surrounding "pastoralists" has rarely been considered within broader comparative studies of trajectories of social complexity (but see Hanks and Linduff 2009). And in this regard, the Mongolian case offers a seemingly unique and significant case study for potential autonomous development and corporate complexity that does not connect easily with such models as the "dependency" one.

Second, while past environmental conditions are now fairly well known in the research region and correlate nicely with the human occupation of the Khanuy Valley, geoarchaeological research (including soil micromorphology and soil chemistry) might provide more detailed

information regarding the use and frequency of use of occupation areas. This is important as for the moment we only have a general understanding of the seasonal use of occupation areas and no understanding whatsoever of site structure. Encouragingly, those geoarchaeological projects that have recently started to address these issues for mobile pastoralists in other world areas are proving that not only are these endeavors feasible, necessary and worthwhile, but that it is possible to attain a level of understanding of the temporal scale and spatial organization of habitation sites that allows for a reconstruction of social activities (e.g. Shahack-Gross et al. 2003; Shahack-Gross et al. 2004; Shahack-Gross and Finkelstein 2008).

Third, the scant and highly fragmentary nature of the faunal remains examined in this study only allowed for a fairly cursory analysis of this material, and thus of their contribution to the overall domestic economy. In many ways, also, sample size proved to be problematic in terms of the range of analytical techniques that could be applied to the assemblages. These limitations were overcome to some extent through the application of statistics, but further remains derived through upcoming larger-scale excavations of domestic occupation areas will increase sample sizes and subsequently reduce the tentativeness of some of the conclusions relating to animal exploitation. A diachronic study of animal exploitation from the Bronze Age to the Early Iron Age would also allow us to evaluate the effects, if any, of large-scale political processes on the subsistence economy of mobile peoples.

Finally, as we are gaining more regional information about the Late Bronze Age and Early Iron Age in Mongolia, further study should also emphasize a diachronic and comparative study of social organization at the campsite/household level. A focus on household remains would provide an important comparative perspective on suprahousehold changes and the evolutionary trajectories of occupation areas in the region. Some knowledge has already been

gained through the test excavations at a number of these habitation sites, but a more detailed study of domestic occupation areas would provide important and crucial comparative data toward evaluating continuity and change in the range, organization and variation of campsite/household activities among mobile pastoralist societies as the region is incorporated into a regional-scale state-like polity.

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